I. Executive Summary

Consortium: Corvallis Microfluidics Technology Hub (CorMic) www.cormictechhub.org

Key Technology Focus Areas (KTFAs): High-performance computing, advanced energy technologies, advanced materials and manufacturing, biotechnology.

Common Technology Platform: Microfluidics, in which microscopic channels in silicon or other materials carry small volumes of liquid for heat distribution, dispensing, mixing, or analysis.

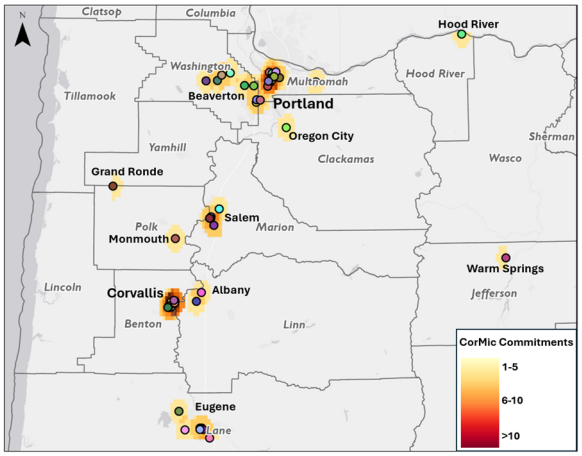

Figure 1: CorMic Region; colors indicate number of CorMic members in each location.

Geographic Boundaries: Corvallis, Oregon Small rural Metropolitan Statistical Area (MSA) with MSA partners (Portland-Vancouver-Hillsboro, OR-WA; Salem, OR; Eugene-Springfield, OR and the small rural MSA, Albany-Lebanon, OR) and Native American communities.

Why Microfluidics? Microfluidics will drive growth and create jobs in *semiconductor cooling* (to reduce the temperature and improve performance of integrated circuits), *continuous flow processing* (chemical synthesis to reduce costs, improve safety, and develop new materials sustainably), and *biotechnology* (to revolutionize diagnosis, treatment, and drug development).

Why Corvallis? Four large regional companies (HP, Intel, NVIDIA, Thermo Fisher Scientific) have joined CorMic because microfluidics is vital for their futures. In addition, Oregon's *Silicon Forest* surrounds Corvallis, and Portland is the most concentrated locus of semiconductor manufacturing in the US. The combined academic enterprises of Oregon State University (OSU), the University of Oregon (UO), and Oregon Health & Science University (OHSU) will contribute expertise, innovation, startups, and a diverse workforce.

Why Now? The semiconductor industry is approaching an abrupt transition to liquid cooling of integrated circuits (ICs). Continuous flow processing (CFP) is replacing batch processing in the chemical and pharmaceutical industries resulting in accelerated discovery of new materials with associated economic and environmental advantages. Life science researchers have demonstrated many microfluidic devices that portend revolutionary advances in diagnosis and treatment; however, commercialization requires further innovation.

Who will benefit? We estimate that CorMic will create between 5,000 and 12,000 jobs by 2033 with substantial employment gains in rural, underserved Oregon regions with below-average employment rates for women and people of color.

II. Synopsis

CorMic will establish global leadership in development, scaling, and commercialization of microfluidics technologies. Its main facilities will reside on the Corvallis HP campus, within the world's most advanced semiconductor-driven microfluidics facility, where HP developed ink jet printing and manufactures millions of ink jet cartridges each month. HP and OSU will co-develop CorMic's *Foundry+* ("foundry plus") facility, which will offer R&D capabilities, state-of-the-art production equipment, guidance from microfluidics engineers, selected IP, and foundry

services. The CorMic *Foundry+* will erect three synergistic facilities for silicon microfluidics, CFP, and biotech that reside in two adjacent buildings. Startups and established companies will integrate microfluidics with digital control circuitry in an environment for advanced technology development and commercialization that they could not otherwise afford.

CorMic will invite startups and established companies to apply to become "end-user members" that advance high-technology readiness products (>TRL6) within the CorMic *Foundry+*. The Regional Innovation Officer (RIO) will recruit businesses with help from the Black Business Association of Oregon and from permanent CorMic Working Groups (WGs) devoted to Entrepreneur Support and Business Support. ecosVC's *Lens of the Market* training will help engineers understand market requirements, develop competitive products, and articulate value propositions. Companies will consult with experts in microfluidics product development and manufacturing, entrepreneurs in residence, professional investors, and potential corporate customers. The Oregon Manufacturing Extension Partnership and the Oregon Workforce partnership will help them scale their business and workforce systems.

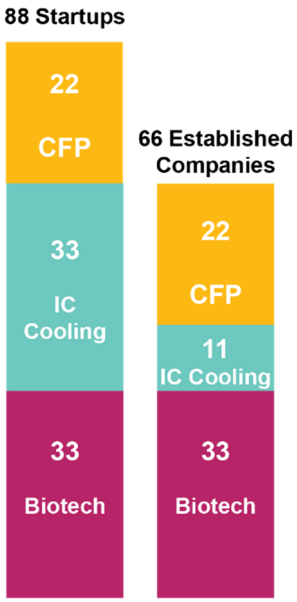

Figure 2: The 154 companies CorMic expects to serve during its first decade.

The CorMic *Foundry+* will accommodate up to 8 companies in the silicon "IC cooling" microfluidics facility, 8 in the materials and CFP facility, and 12 biotech companies at any one time. During the first decade, CorMic will serve 154 end-user companies, which will use the facility for an average of 9 months. **Figure 2** shows those companies by status and application. **Figure 3** shows that technicians and engineers will account for 65% of jobs in CorMic created by end-user companies.

Table 1 shows expected outcomes of two scenarios. Under Scenario 1 (*10%* of CorMic end-user companies survive into 2033), we anticipate that *a)* in 2033, these end-user companies and teams will employ 751 people, *b)* they will have created a total of 4,970 net new jobs (direct, indirect, and induced), and *c)* they will create annual value added (GDP) of $914M by 2033. Under Scenario 2 (*40%* of CorMic end-user companies survive into 2033), we expect that they will employ 1,878 people, will have created 12,426 new jobs, and will create annual value added (GDP) of $2.3 billion. As part of these major job growth outcomes, CorMic is committed to increasing the participation of underserved communities among founders and employees of CorMic end-user companies. We will collaborate with a broad range of experienced organizations that share this commitment.

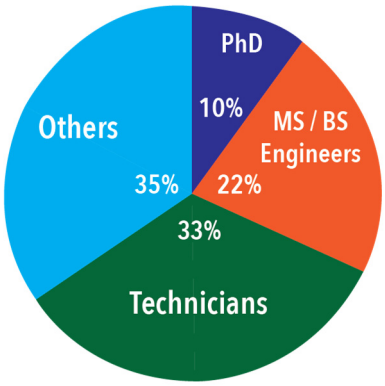

Figure 3: Distribution of employees in CorMic end-user companies.

Leadership and Members: The RIO, Chief Operating Officer (COO), Regional Business Development Officer, CorMic Advisory Board (CAB), and the four WGs bring extensive industry experience. The RIO will control the budget and maintain independent decision-making authority. The following organizations will collaborate to accelerate innovation and nucleate new businesses:[1]

Large Companies: Intel, NVIDIA, HP, Siemens, and Thermo Fisher Scientific (TFS) will bring expertise in design, simulation, development, manufacturing, sales, and marketing, as well as

their value chains.[2] HP will contribute microfluidics development and manufacturing facilities, IP, technical guidance, and foundry services. Intel and NVIDIA will advise member companies as they develop IC cooling solutions. Siemens will identify new R&D collaborations to realize the full potential of the market. TFS and HP will commercialize CFP systems for chemical synthesis and biotech systems for medical diagnosis and treatment. No single large company could bring the breadth of understanding required to realize the potential of microfluidics.

Table 1: Expected Outcomes

Scenario 1: 10% of CorMic End-User Companies Survive into 2033				
	Employment	**Labor Income ($M)**	**Average Total Compensation ($K)**	**Value Added (GDP) ($M)**
Direct	751	138	184	306
Indirect (Business Spending)	1,919	192	100	333
Induced (Employee Spending)	2,300	151	65	275
Total	**4,970**	**481**	**97**	**914**
Scenario 2: 40% of CorMic End User Companies Survive into 2033				
	Employment	**Labor Income ($M)**	**Average Total Compensation ($K)**	**Value Added (GDP) ($M)**
Direct	1,878	345	184	766
Indirect (Business Spending)	4,798	480	100	830
Induced (Employee Spending)	5,750	376	65	685
Total	**12,426**	**1,202**	**97**	**2,282**

Source: IMPLAN Group, LLC. Analysis by Damon Runberg, Regional Economist, Business Oregon

Startup Companies: CorMic has recruited 5 regional startup companies[3,4,5,6,7] in microfluidics that nucleated recently and will recruit others from inside and outside the region.

Investors: CorMic has attracted Silicon Catalyst, Intel Capital, NVIDIA Inception VC Alliance, HP Tech Ventures, and venture development organizations that focus on underrepresented populations[8] (Oregon Venture Fund, Elevate Capital, and Portland Seed Fund). Professional investors favor new ventures that align with our themes of IC cooling, CFP, and biotechnology.[9] CorMic will liaise with regional community development financial institutions[10,11,12,13,14,15,16,17] and connect them with underserved entrepreneurs who may need loans, capital, or housing.

Educational Resources: OSU, UO, and OHSU will train a microfluidics workforce, generate innovations, nucleate startups, provide engineering expertise, and contribute incubators and entrepreneurship training.[18,19,20,21] To prepare youth for post-secondary education and adults for technician jobs,[22] CorMic will draw upon OSU Extension,[23] four community colleges (CCs), four WD organizations,[24,25,26,27] and community groups such as Centro Culturál, Casa Latinos Unidos, and the Warm Springs (Native American) Community Action Team. CorMic will issue subawards to UO and OHSU to develop academic programs and provide incubator and accelerator services.

Government and Economic Development: The Governor's office[28] will incentivize companies outside Oregon to expand into Corvallis. The Oregon Business Development Department ("Business Oregon") will recruit new and established microfluidics companies. The City of

Corvallis will coordinate transportation and housing, and the Corvallis-Benton County Economic Development Office will provide business loans and tax credit programs.

Service Organizations: WorkSource Oregon[29] will support trainees with wraparound services.

Component Projects: Four component projects (**Figure 4**) complement each other: *Construction & Facilities* creates the environment for *Technology Maturation*, *Workforce Development* supports the ecosystem, and *Governance and Strategic Planning* plans, oversees, and coordinates the entire consortium.

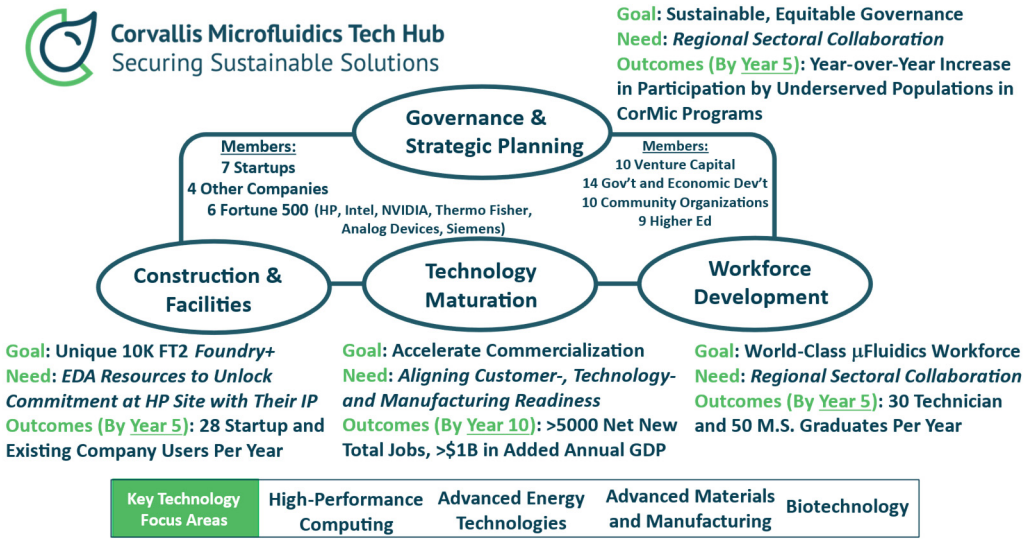

Figure 4: Component Projects

Construction & Facilities: This project will create and equip within the HP Corvallis Campus a unique cutting-edge facility, the CorMic *Foundry+*, which will offer holistic, interconnected capabilities for commercializing microfluidics-based technologies in the semiconductor, materials, and biotech industries.

Technology Maturation: This project will create a process in which companies focused on High-Performance Computing, Advanced Energy Technologies, Advanced Materials and Manufacturing, and Biotechnology can take advantage of facilities, training, entrepreneur support, funding, and scale-up consulting to commercialize their products.

Workforce Development (WD): This project will create a new world-class microfluidics workforce in the CorMic region by forming an industry-led sectoral partnership of companies, universities, CCs, training organizations, and WD organizations that will develop and execute innovative programs for inclusive outreach, training, and education.

Governance and Strategic Planning: This project will plan, execute and evaluate programs to create a globally leading microfluidics economic engine in the region. Our governance model will enable CorMic to stimulate innovation, train a workforce, commercialize microfluidics products and technologies, create new jobs, and increase U.S. economic and national security.

Investment, Policy, or Other Relevant Commitments: Business Oregon and HP will invest ~$7.8M in cost-share. In addition, HP will grant CorMic end-users access to its microfluidics manufacturing technology and to *skilled* microfluidics engineers. The Oregon Legislature, having passed the 2023 Oregon CHIPS Act, will enact policy changes to improve industrial land site readiness and to direct state investments in higher education and workforce development.

Global Competitiveness: Three global industries – semiconductor, chemical / pharmaceutical manufacturing (CFP), and biotechnology – are expressing immediate need and pent-up demand for CorMic technologies. CorMic will enable companies to develop competitive products quickly, learn from each other, and share components and manufacturing processes.

Semiconductor Cooling: Semiconductor Research Corporation's 2023 Microelectronics and Advanced Packaging Technologies Roadmap calls for "dramatic innovations in cooling technologies."[30] "NVIDIA describes the problem: "The thermal design power and power density of microelectronics is increasing abruptly. The ever-increasing trend of localization of power is the result of heterogeneous integration of different silicon dies on a single package. Air cooling is no longer sufficient to meet these challenging requirements. An aggressive cooling solution is needed to keep up with the surge in electronics power density."[31]

To continue the progress associated with Moore's Law, the industry must adopt 3D ICs with vertically stacked layers. Chip makers have begun the transition with "2.5D" architectures. John Park, Product Management Group Director at Cadence, explained, "There are good reasons why full 3D was not attempted first. The top three problems are thermal, thermal, and thermal. How do you dissipate all the heat being generated as you start building this chimney stack?"[32]

Intel has demonstrated a *Micro-Channel Integrated Heat Spreader* that delivers higher efficiency than any other viable approach;[33] it exceeds the cooling efficiency of a standard cold plate by 30%.[34] *NVIDIA is investigating microfluidic cooling in an ARPA-E-funded $8M collaboration with HP*. The global market for microfluidic cooling of IC's will constitute a substantial share of the market for liquid cooling systems in data centers, which will grow from $3.5B in 2022 to $30.6B in 2031.[35] GPUs, CPUs, IGBT, and other high-power components will require microfluidic cooling. By developing technology to cool GPUs, CorMic will accelerate the development of generative AI, which, according to Goldman Sachs, could drive a 7% (~ $7 trillion) increase in global GDP and increase productivity growth by 1.5% over 10 years.[36]

Continuous Flow Processing: The global market for CFP systems may grow from $1.7B in 2023 to $2.9B in 2028.[37] The chemical and pharmaceutical industries have recognized that microfluidic reactors will enable them to manufacture products more safely,[38] inexpensively,[39] and sustainably[40] than conventional batch processes. CFP allows chemists and engineers to conduct exothermic reactions safely at higher concentrations,[41] temperatures,[42] and pressures[43] and thereby to accelerate reactions[44] and enable new reactions.[45] CF processes also offer advantages related to flexibility,[46] versatility,[47] and scale-up.[48,49] The FDA has recognized CFP as one of the most important tools to modernize the pharmaceutical industry.[50] A 2022 National Academy report, *The Importance of Chemical Research to the U.S. Economy,* identified CFP as an emerging need.[51] The chemical sectors of the U.S. economy support 4.1 million American jobs and generate $5.2T of economic activity, or 25% of the U.S. GDP.[52]

Biotechnology: The global market for microfluidic medical and life science products will grow from $30B in 2022 to $103B in 2032.[53] In laboratory demonstrations, microfluidics technologies have improved diagnosis and treatment while reducing costs. Handheld, sensitive, inexpensive, recyclable microfluidic diagnostic tools[54] that deliver reliable results within seconds at the point of care will help CorMic companies to compete globally in sales of diagnostic devices.[55]

Climate and Environmental Responsibility: Intel,[56,57] NVIDIA,[58] HP,[59] and TFS[60,61] have made pervasive commitments to sustainability. HP will assure that end-user members' work at the *Foundry+* complies with applicable laws and regulations and HP's policies.

CorMic will reduce the environmental burden of data centers, which consume ~2% of US electricity[62] and emit 100M tons of CO_2 each year.[63] Data centers allocate 50% of their energy for computation and 35% for cooling. The ARPA-E funded collaboration between HP and NVIDIA will reduce the cooling budget from 35% to 5% of the total. CFP systems will enable chemical manufacturers and researchers to improve atom economy and reduce chemical waste.[64] Within 5-10 years, CorMic will support microfluidic batteries,[65] fuel cells,[66] models to evaluate geological media for oil recovery[67] and carbon sequestration,[68] and sensors[69] that detect pollutants in soil,[70] water,[71] and air.[72,73]

Outcomes, Timeline, and Evaluation: Section IX specifies outcomes over a 10-year timeline. The four component project applications describe detailed evaluation plans and timelines.

III. Barriers to Commercialization

Workforce: To assure global leadership in microfluidics, CorMic must develop a workforce of technicians and engineers. **Figure 5** shows how many technical employees CorMic member companies must hire annually in a low-survival scenario (10% of CorMic end-user companies survive into 2033) and in a high-survival scenario (40% survive into 2033). Our WD component project will tackle this barrier and create the required workforce, despite the dearth of focused academic programs across the US and internationally. Our solution employs a sectoral partnership among industry, higher education, and WD organizations. OSU, UO, and OHSU will meet the demand for engineers by creating new microfluidics courses. Community colleges (CCs) and WD boards working with CorMic will prepare technicians.

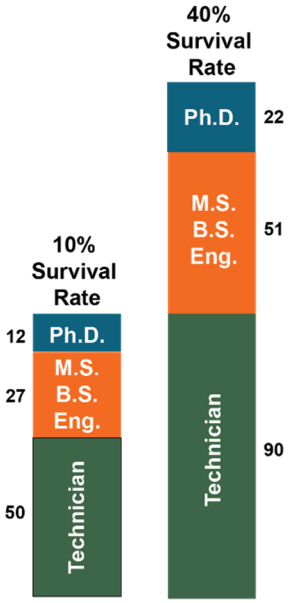

Figure 5: Average aggregated hires per year by CorMic end-user companies

Investment: Entrepreneurial programs have multiplied in the CorMic Region, but investment in high-tech startup companies remains inadequate.[74] CorMic's team of investors will consider investment opportunities, refer end-users to investor networks, help to form executive teams, and provide contacts within established companies.[75,76]

Alignment: New and growing hardware businesses typically lack prototyping and scaling facilities combined with subject matter expertise. To succeed, they need guidance to manufacture products at low cost.[77] They need to optimize materials[78] and manufacturing techniques,[79] and they critically need to align customer, technology, and manufacturing readiness levels. With EDA investment, CorMic's entrepreneur training, technical services, and new facilities will solve these problems.

IP: Clear IP ownership is critical for small companies seeking investment for growth. HP will make its semiconductor-driven digital microfluidics IP available to CorMic member companies on a non-competing basis, following principles we will codify in legally binding detail. CorMic end-user companies will own the IP they develop within the *Foundry+*, per the IP policy detailed in the Risk Mitigation Plan.

Standards: The microfluidics industry currently lacks industry-wide standards that make it possible to combine components and subsystems from different vendors[80] and that would render microfluidic products compatible with other technologies.[81] CorMic will help NIST to establish supportive standards.

IV. Nexus

The CorMic Region is the world's most concentrated nexus for microfluidics activity. Intel, NVIDIA, HP, and TFS recognize microfluidics as critical to their future success. The region's *Silicon Forest* gives Oregon the country's highest concentration of semiconductor manufacturing and the world's most concentrated cluster of semiconductor R&D (>1,000 patents per year). NVIDIA has become the world's most valuable semiconductor company by market valuation. Intel employs 22,000 people at four campuses in Hillsboro. CorMic will reside within the Corvallis Campus of HP, the leader in silicon-driven microfluidics. TFS has achieved a 7% share of the market for microfluidic products for medicine, proteomics, cell therapy, and drug discovery. The U.S. needs better, cheaper health care, and microfluidics promises to revolutionize medical diagnosis and treatment. Oregon provides homes for 1,460 biotech companies.

U.S. Economic and National Security: According to the Semiconductor Industry Association, "Semiconductors are at the heart of America's strength, enabling the essential technologies that drive economic growth and national security."[82] Global semiconductor sales reached $625B in 2023 and may grow to $1.3T in 2032.[83] The U.S. IC industry employed 345,000 people in 2023, and that number may increase to 460,000 by 2030.[84] In 2019, 9% of semiconductor production supported national security and critical infrastructure (e.g., defense, aerospace, utilities, and financial services).[85] Microfluidic cooling will enable the IC industry to continue to advance and support innovation in critical areas for the US economy.

Continuous Flow Processing of Electronic Chemicals: The foundation of any plan to enhance national security by onshoring semiconductor manufacturing must include a strategy to produce raw materials. Virtually all raw materials for an IC (except silicon) are liquids and gases. The global market for electronic chemicals for IC manufacturing will grow from $74B in 2023 to $128B in 2033.[86] Asia-Pacific suppliers dominate this market because of their lower labor costs.

Semiconductor manufacturers will require innovative, high-purity chemicals to manufacture new circuits with new configurations at high yields. James O'Neill, CTO at Entegris, an American manufacturer of electronic chemicals, said, "Materials innovation is the primary driver for improved performance" of electronic devices.[87] CorMic end-user companies will apply CFP to identify new electronic materials, manufacture them with high purity, price them competitively with lower CapEx and OpEx, and thereby secure supply chains by onshoring their manufacture.

Inpria, an OSU spinout and a CorMic member, leads the development and manufacturing of photoresist for next generation ICs. JSR Corporation purchased Inpria for $514M in 2021. Valliscor has disclosed technology to manufacture 1,3-hexafluorobutadine (HFB), a common semiconductor etchant,[88,89,90] and expressed plans to become its first non-Asian manufacturer. CorMic will enable Valliscor to develop a manufacturing process and to commercialize HFB.

Private Sector Entities: In 2022, Intel employed 131,900 people and achieved sales of $63.1B. Intel has shown the superiority of microfluidic IC cooling. Pooya Tadayon, Intel Fellow, said, "If you build integrated heat spreaders with microfluidics channels, you can get a performance benefit of 30%."

NVIDIA, the leading supplier of chips for data centers, achieved sales of $27B in 2023. NVIDIA revenue from sales to data centers has grown at a compound *quarterly* rate of 40.6%, from $3.3B in Q4 FY21 to $14.5B in Q3 of FY23.

Thermo Fisher Scientific achieved sales of $44.9B in 2022.[91] The company supplies microfluidic products and systems for medicine and life science as well as CF systems for pharmaceutical companies. TFS will review partnership opportunities with emerging companies.

HP leads the mature market for ink jet printing, the first major market for microfluidics. In FY22, HP's printing business reported net revenue of $18.9B, including $11.7B from printing supplies. HP has introduced the Tecan *D300e Digital Dispenser*,[92] a microfluidics-based bioprinter that deposits minute quantities of pharmaceutical samples, and the HP *D100 Single Cell Dispenser*,[93] which dispenses single cells and reagents with high precision.

CorMic will recruit participants from relevant value chains, such as *a)* operators of Oregon data centers[94,95] and manufacturers of both IC cold plates[96,97,98] and liquid cooling systems,[99,100,101,102] *b)* manufacturers of components[103,104,105] and systems[106,107,108,109] for biotech applications, and *c)* manufacturers of specialty chemicals,[110] pharmaceutical building blocks,[111,112] and chemicals for IC manufacturing,[113,114,115] as well as CFP systems[116,117,118] and components.

V. Commitments

Beyond the combined $7.8M cost-share from Business Oregon and HP, CorMic has secured additional commitments. OSU, UO, and OHSU have combined commitments of up to $13M for new faculty hires and seed capital. These universities will create new academic programs related to microfluidics and a *Future Instructor Training Program* to fill positions at community colleges. Linn Benton CC will co-develop and offer training for CorMic-related CFP technicians. The 65 CorMic member organizations, by participating in Working Groups, have committed an estimated $1.4M in in-kind salaries over 3 years. As part of their CorMic engagement, Valliscor, EMD, Inpria, and others will transform current batch process manufacturing to CFP.

VI. Sustainability

CorMic's business model will resemble that of OSU's Advanced Technology and Manufacturing Institute (ATAMI), a breakeven 80,000 ft^2 incubator on HP's Corvallis campus that has helped early-stage companies at TRL 1-5 to develop materials-related technologies for over 17 years. ATAMI generates revenue via lease agreements and equipment fees. CorMic end-users will have reached more advanced stages of development than tenants entering ATAMI, given CorMic's focus on high-technology-readiness products (>TRL6). We expect that CorMic end-users will cover contractual terms by bringing federal, state, angel, or VC funding or by establishing non-recurring engineering or joint development agreements with CorMic corporate partners.

EDA funding and the cost-share will support all CorMic projects. A gradual transition to new funding sources will begin no later than the onset of Year 5. Expenses include the governance, WD, construction, maintenance, and *Foundry+* access and services. By Year 6, Governance will cost $1.5M - $2.8M, WD $250K - $850K, and Technology Maturation will cost $1.5M - $6M. We consider the lower range of costs, totaling $3.2M/year, the minimum to sustain CorMic operations. The upper range of costs, totaling $9.7M/year, assumes full-capacity operation. To sustain the component projects, CorMic will pursue funding from Oregon's Center of Innovation Excellence program, overhead charges on end-user contracts, Oregon's Future Ready Oregon WD initiatives, and industry support for internship and technician training programs. CorMic will build a cash reserve to support the post-EDA transition, cover unexpected expenses, and invest in new capabilities and programs.

VII. Labor Practices

The proposed construction work will rely entirely on union labor in alignment with HP practice.

VIII. Equity

CorMic will integrate equity, diversity, and inclusion into all aspects of the Tech Hub. Our workforce development programs include outreach initiatives that engage youth in their communities, geographically and socially, and provide inclusive pathways to training and post-secondary education where the involved institutions have strong commitments to underserved populations. To increase representation in CorMic's technology maturation and business creation efforts, we will endeavor to increase the year-over-year participation of underserved populations through active recruiting, effective program design, and the support of venture and economic development member organizations with demonstrated successes in inclusive programming.

IX. Goals and Outcomes

Key Strategic Long-Term Goals: *1)* Create a globally leading microfluidics industry cluster aligned with US economic and national security goals. *2)* Attract new ventures to the region to amplify technology development and innovation. *3)* With state and federal agencies, establish revenue-generating partnerships that align with emerging national security and economic development priorities. *4)* Create a diverse, world-class microfluidics workforce through innovative academic programs, new specialty training, and outreach programs that eliminate educational attainment gaps among white Oregonians and underserved populations. To achieve these goals, CorMic expects to achieve these objectives over 10 years:

- Serve 150+ end-user companies, create over 12,000 net new jobs (*direct, indirect, and induced*), and add as much as $2.3B in annual GDP to the region's economy.
- Create a workforce to support 1,878 new *direct* jobs by 2033, 65% being technical jobs.
- Achieve year over year increases in the participation of underserved populations in CorMic programs and companies.
- Establish an ecosystem with 50+ new microfluidics companies and/or expansions and their value chains.

CorMic will stimulate advances in semiconductor performance,[119] thermal management of high-power electronics,[120] the market impacts of AI, the economics and sustainability of data centers[121] and chemical manufacturing plants,[122] the discovery of new materials for electronics,[123] synthesis routes for new chemicals with targeted properties,[124] and drug development, point-of-care diagnostics,[125] and therapeutics.[126,127] **Figure 6** shows the CorMic logic model.

X. Housing

CorMic will partner with economic development organizations and government offices throughout our region to ensure adequate housing for the growing microfluidics ecosystem. The City of Corvallis has updated policies to increase housing supply; for example, the city now allows middle housing types in all low-density zones and provides property tax exemptions to developers who operate affordable housing and mixed-use developments. The scarcity of land upon which to build housing remains a key issue. A recent annexation policy update now allows a more efficient process for building homes on land already set aside for housing.

XI. Updates

Since the Phase 1 designation, CorMic has *a)* hired the RIO, *b)* selected the Regional Workforce Development and Diversity Officer, one CAB member, two Site Directors, and two Alliance Managers, *c)* created a governance structure, *d)* added 34 new members, including two tribal

communities, *e*) secured $7.8M in cost-share and ~$14M in additional commitments, *f)* completed a Preliminary Engineering Report and design of the CorMic *Foundry+*, *g)* secured commitment from CCs to co-develop instructor and technician training programs, and *h*) secured commitment from OSU, UO and OHSU to develop new graduate programs.

XII. Awareness and Commitment

Each consortium member has read this Overarching Narrative and committed to executing the components of the Tech Hub for which it is responsible. Please see Letters of Commitment.

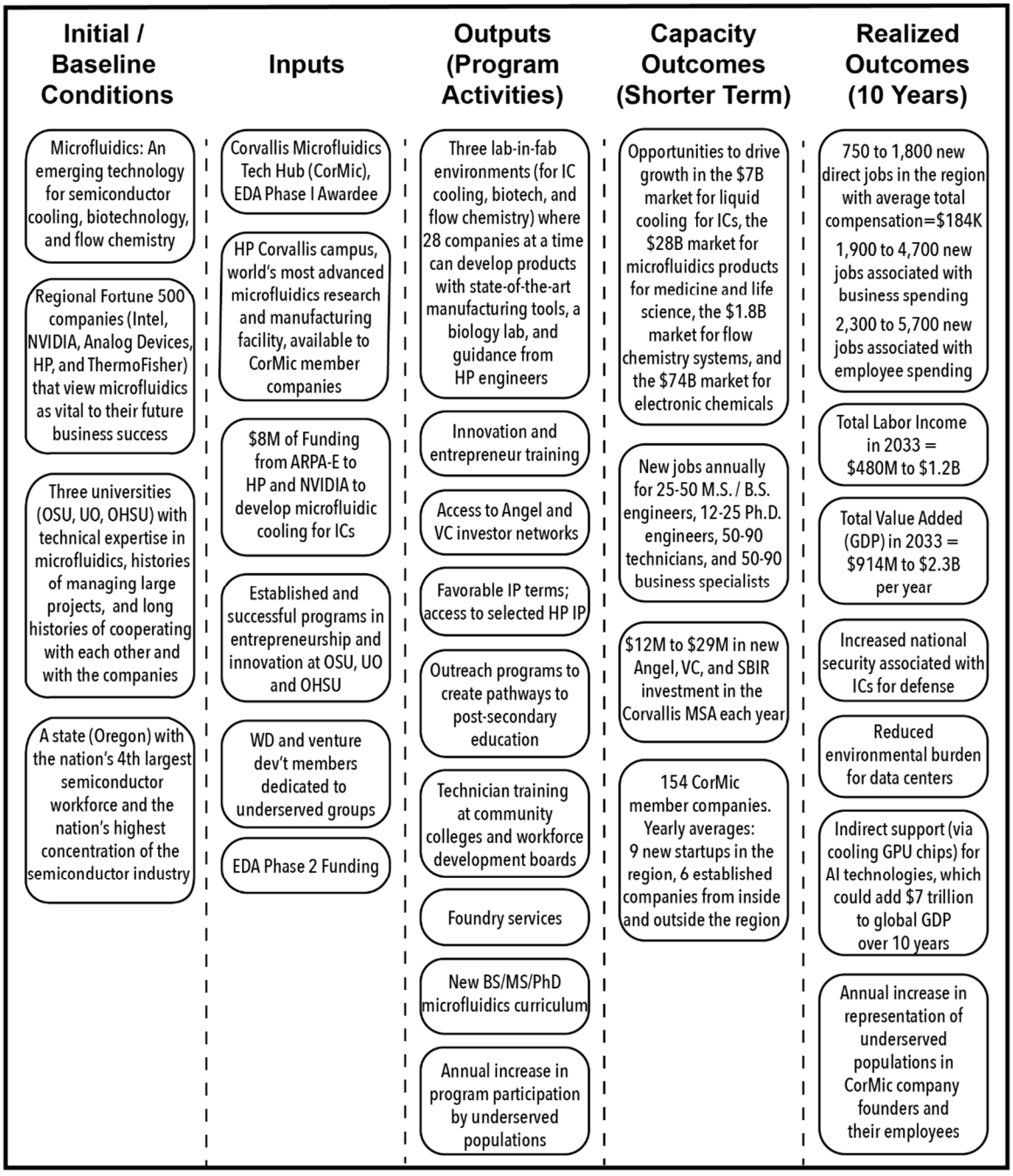

Figure 6: CorMic Logic Model

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