NEXTFLEX®

America's Flexible Hybrid Electronics Manufacturing Institute

PROJECT CALL 11.0: RESILIENCY & EFFICIENCY

GUIDEBOOK

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PROJECT CALL 11.0: RESILIENCY & EFFICENCY

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PREFACE

Project Call (PC) 11.0 is the eleventh project call issued by NextFlex® (the "Institute"). Like the previous project calls, it is intended to advance the state of the art in manufacturing for hybrid electronics and to promote the strength, competitiveness, and interconnectedness of the U.S. manufacturing industrial base for hybrid electronics. Each NextFlex project call builds from and implements changes relative to past project calls, and all proposers should carefully read all sections of this guidebook to understand changes in proposal development, required content, submission, evaluation, eligibility, and selection criteria. Important considerations for PC 11.0:

- Proposal process will be 1-stage (straight to full proposal) – there is no pre-proposal round
- Discussion with NextFlex during proposal development is strongly encouraged to ensure that proposals align to the goals of the topics
- Projects are expected to be technically focused and of modest duration (maximum duration for all topics is 15 months)
- Topic areas are broadly defined, allowing proposers to determine the specific subject of their proposal; proposals should explain the importance and relevance of the chosen subject
- Alignment of proposals to DoD Critical Technology Areas and other DoD priorities are strongly encouraged (for more information, see https://www.cto.mil/cta/)
- Projects that leverage prior NextFlex investments are encouraged. All projects should have meaningful impact on U.S. hybrid electronics manufacturing and technology
- Unless otherwise qualified, the industrial base as used here refers to the entire complex of entities comprising the foundation of the nation's manufacturing – for-profit companies (the commercial sector), non-profit organizations (including universities and research laboratories), government-owned manufacturing sites (e.g. the organic industrial base), workforce organizations, and others.

SECTION 1. HYBRID ELECTRONICS DEFINITION

NextFlex defines hybrid electronics broadly to advance U.S. manufacturing capabilities and strengthen domestic industrial base. This definition includes electronics that integrate additively manufactured circuitry, passive devices, and sensor systems produced using additive techniques (sometimes referred to as printed electronics) alongside discrete components such as bare or packaged ICs, passive devices, and sensors. These technologies leverage the power and miniaturization of semiconductors along with the cost advantages and unique capabilities of printed circuitry, enabling a new class of devices for critical sectors including the Internet of Things (IoT), medical, robotics, consumer, communication, and defense markets. Hybrid electronic devices can be designed to conform to various shapes and may also bend, twist, or stretch, though mechanical flexibility is not a requirement. NextFlex focuses broadly on hybrid electronics manufacturing methods and technologies, encompassing rigid, flexible, stretchable, and conformal designs—including direct-deposited circuitry applied to 3D surfaces with or without a substrate or carrier. Additionally, related manufacturing approaches, such as additive semiconductor packaging and additive printed circuit fabrication, are within scope, supporting the growth and resilience of domestic electronics production.

In light of this, the Institute focuses its efforts on solutions that incorporate discrete components into systems with a significant contribution from additive processing as part of the design and fabrication approach, whether in flexible, stretchable, conformal, or rigid form factor. Proposals and approaches that target pure "printed systems" such as additive processing of organic transistors or other logic systems (metal oxide, carbon nanotubes) as their primary focus will most likely be considered at too low of a Technology Readiness Level (TRL) for Institute Project Calls at this time. Conversely, approaches that appear to be incremental advancements on currently mature manufacturing technologies will potentially be considered at too high a TRL/MRL (Manufacturing Readiness Level) to be considered for Institute funding (such as a conventional flexible circuit technologies utilizing solely etched copper for conductors, Commercial Off the Shelf (COTS) packaged die for the active components at the system level, and solder reflow assembly). More details on MRL and TRL can be found at http://www.nextflex.us/trl-cheat-sheet/ and http://www.dodmrl.com/.

SECTION 2. INTRODUCTION AND BACKGROUND

As a Department of Defense-sponsored Manufacturing Innovation Institute (MII) that is part of Manufacturing USA, NextFlex is a public private partnership, a dynamic, collaboration-based Institute formed to facilitate technology innovation, transition, and commercialization, accelerate workforce development, and promote a vibrant and capable U.S. industrial base for advanced manufacturing. The Institute consortium is industry-led with significant participation from DoD and academic partners. One mechanism to enable technology adoption and transition is to provide funding to proposal teams undertaking development projects that are critical to hybrid electronics manufacturing and that strengthen developers and strengthen the supply chain. The Institute may provide funding for *up to* 50 percent of the development cost of projects selected through this structured process. Projects submitted to NextFlex for funding should consider the value to the Institute and the hybrid electronics industry as well as the future goals of advancing the hybrid electronics industrial base within the U.S. and clearly articulate those aspects to the Institute in the proposal process. In addition, all projects should define a commercialization or technology transition plan that demonstrates industry pull for the proposed manufacturing technology development beyond the end of the funding period.

It is an underlying tenet of the Institute funding model that projects should benefit all members, not only those performing the work. Projects are typically proposed and executed as a collaboration between at least several member organizations (e.g. companies and/or universities). Each project team presents periodic updates and publishes technical reports for other NextFlex members to review.

Project Call 11.0 addresses prioritized technical gaps identified in the Hybrid Electronics Technology Roadmap developed by the NextFlex Technical Working Groups (TWGs) through partnership among industry, government, and university subject matter experts (SMEs). PC 11.0 emphasizes projects that address critical hybrid electronics manufacturing challenges and demonstrate key capabilities, enabling the transition of hybrid electronics devices into applications that require superior performance, improved form factors, and assured reliability.

Projects are intended to be technically focused, of moderate size, and of duration consistent with delivering near-term impact. Each topic aligns with the roadmap gaps from one or more TWG. Projects that aim to develop technology demonstrators should also address manufacturing challenges associated with applications and devices in those areas.

Through the previous Project Calls, NextFlex has increasingly focused the process, building upon developments from earlier Project Calls. A summary of the technical focus of each previous NextFlex Project Calls is presented in Table 1. It is anticipated that Project Call 11 will have a second part with additional topics, planned to be announced later in 2026, subject to availability of funds.

Table 1: Overview of the technical priorities highlighted in recent Project Calls.

Project Call	Technical Focus
PC 8.0	Advanced packaging, reliability in harsh environments, life cycle improvements
PC 9.0	Cross-cutting manufacturing gaps and adoption of additive manufacturing processes in PCB manufacturing.
PC 10.0	Maturing manufacturing capabilities and delivering impact to the Industrial Base
PC 11.0	Part 1: Resiliency and Efficiency Part 2: TBD

Project Call 11.0 continues the use of broadly defined topics to enable a diverse proposer base, with special emphasis on areas in which hybrid electronics can impact high priority U.S. manufacturing opportunities and areas of emerging importance within the hybrid electronics community. Proposals should build on and take advantage of developments from prior project calls, where appropriate, as well as the best available technology.

Projects are expected to address industry-driven problems, with proposed solutions and concepts to transition to the U.S. manufacturing industrial base. Within the broadly defined topics, proposers must identify the specific needs and opportunities as well as the impact that success will have on U.S. hybrid electronics manufacturing. PC 11.0 is anticipated to fund up to approximately $1.9M in projects. Including cost-share, the total project value is expected to exceed $4M. The number of awards per topic will be based on the quantity and quality of the submitted proposals, the funding requests of those proposals, and alignment with the overall roadmap and mission of the Institute.

Projects focused on developing or demonstrating manufacturing capabilities will focus on processes, critical components, foundational data, or software tools. Projects proposing to develop hybrid electronics demonstrators may produce fully functioning systems or focus on demonstrating hybrid electronics-based subsystems. In the latter case it is important that the proposal clearly describe criteria, metrics, and methods for how the demonstrator will be evaluated to show that the project advances the field. Projects that produce demonstrator devices will be required to produce these demonstrators/prototypes in sufficient quantity to demonstrate that scalable manufacturing techniques are used in the production thereof. Efforts in all areas will be expected to share the data that is generated with the NextFlex member community.

Important considerations:

- NextFlex anticipates funding one project in each topic area; however, other outcomes are possible depending on the cost and quality of the projects proposed.
- Given the clear focus on projects that have a near-term commercial impact and transition potential, teams that are industry-led or have a strong industry partner as part of the commercialization plan will be favorably considered in the evaluation process.
- Proposals that include an engaged DoD stakeholder will be given strong preference. Examples of engagement include: a signed Memorandum of Understanding (MOU), a co-development partner from a service lab, requirements from a representative of a Portfolio Acquisition Executive (PAE) or Program Executive Office (PEO), a partner in the Organic Industrial Base planning to adopt the technology, etc.
- Proposals that fall within the topics area definitions that address DoD Critical Technology Areas and other priorities of the DoD.
- Prior to final awards, recipients and development partners who are not already NextFlex members will be required to become members of the Institute and execute a development agreement.
- Should teams find that the topics listed herein are not of interest to their organizations, NextFlex always welcomes suggestions for future project call topics; recommendations should be brought to the attention of the NextFlex TWGs.

NextFlex Technology Hub and Pilot Line: NextFlex and its members have collaborated to create a shared hybrid electronics fabrication facility for prototyping and low volume manufacturing in a class 10,000 cleanroom, along with the design and process engineering to support it. This facility, the NextFlex "Technology Hub," includes both standard electronics manufacturing services (EMS), printing tools, as well as hybrid electronics manufacturing tools developed through prior Project Calls and placed into service by member and non-member companies. Capabilities may support the transition from development to production for Institute members. The NextFlex Technology Hub is an ideal environment to integrate and collaborate across projects, thereby strengthening long-term capabilities for the hybrid electronics community. Proposal teams are encouraged, when possible, to:

1) Leverage the hybrid electronics manufacturing and testing capabilities in the NextFlex Technology Hub during the execution of the project,

2) Demonstrate newly developed hybrid electronics manufacturing processes on the Technology Hub tools. This facility may also be appropriate for technology demonstrator projects, and
3) Collaborate with NextFlex to transition processes developed through Project Calls to the Technology Hub so they can be accessed by others in the industrial base.

To accomplish these, proposal teams may seek the involvement of NextFlex Technology Hub staff from engineering and fab groups in projects.

Proposal teams may receive more information about the Technology Hub and its capabilities through the website * and may initiate discussion about integrating its capabilities into proposals by contacting proposal@nextflex.us.

In addition to engineering services support, design information for the NextFlex-developed 'A21' flexible microcontroller device can be made available to NextFlex members to serve as the basis for demonstrator development. For additional information regarding the specifications and capabilities of the A21, please contact proposal@nextflex.us.

Manufacturing USA: As a MII sponsored by DoD and part of the Manufacturing USA network, NextFlex has specific objectives and requirements for Project Calls that may differ from other familiar programs. All submitters, regardless of prior proposal experience, should take special note that the ways in which NextFlex and other Manufacturing USA Institutes operate may be quite different than those to which proposers may be accustomed and different from each other. For example, NextFlex development projects should not be compared to SBIR, STTR, or other similar programs. The objective is not to conduct basic scientific research nor to develop specific products, but rather to solve common gaps that many companies in the hybrid electronics manufacturing ecosystem are facing. NextFlex projects are intended to address Advanced Technology Development and must be designed around time-bound and measurable deliverables with clear performance metrics. For those accustomed to government acquisitions, NextFlex programs are aimed at co-funded development and allow the proposer to define the specific objectives within the scope of the Project Call topic. Consequently, a cost share element is required. Unlike typical commercial customer activities these projects are not aimed at developing or delivering a specific product, the *approach taken* is as important as the promised outcomes, and the proposal evaluation criteria reflect this. Project funding will follow a cost reimbursable agreement. If the lead or any partners of the proposal team have audited indirect rates, those must be used. Commercial rates or profit (fee) are not allowable for Project Call proposal submissions.

Project Scale and Duration: The federal funding available on a per project, per topic basis is indicated in each topic description section. These numbers were developed by the Technical Working Group process, based on anticipated scope and resources required to deliver the requested statement of work, and are informed by total available funding. The maximum duration of proposed projects is 15 months or less for this part of PC 11.0 and the maximum for each topic is specified; aggressive timelines are encouraged. It is expected that **no time extensions for projects under this Project Call will be possible**, so all proposers must plan and scope their proposal accordingly.

NextFlex projects must meet a minimum MRL of 4 in the foundational work upon which projects are built. In consideration of this requirement, proposing teams must demonstrate that this criterion is met by providing sufficient evidence in the technical proposal (e.g. by providing published references, photos and data regarding physical demonstrators, etc.) or in an accompanying file submission (to be used for information that cannot be presented in the written proposal, e.g. video demonstration). Such accompanying submissions must not be used to exceed the proposal length limits. The option to provide physical samples to demonstrate MRL may be discussed during pre-submission consultation with NextFlex.

Cross-Institute Collaboration and Leveraged Funding: As of 2026, 17 Manufacturing USA Institutes exist in various technology areas†. Proposals that enable collaboration between Institute programs and

* https://www.nextflex.us/technology-hub/
† https://www.manufacturingusa.com/institutes

have access to funding from more than one Institute should be identified by the proposers for the consideration of the reviewer base, as collaboration across technology fields with strong market demand is always encouraged. Information about other Manufacturing USA Institutes can be found online at https://www.manufacturingusa.com/institutes.

NextFlex also encourages proposals that bring in co-investment from other sources including other government agencies, commercial sponsors, state governments and where appropriate, other type of research entities. Projects with co-investment by DoD customers and those that complement other ongoing DoD sponsored projects are highly encouraged and such leverage should be described to the extent possible.

Leverage of Other Programs: As already noted, projects that address DoD Critical Technology Areas and priorities of the DoD are strongly encouraged. Proposers that are currently working on programs funded by other sources that could be enhanced by additional scope funded through this project call may propose such activities. All requirements of this project call must still be met. Such leverage of other sources of funding sources will be viewed favorably, however it should be noted that other Federal government funding cannot be counted as cost share and no cost share may be double-counted for separate projects.

SECTION 3. HYBRID ELECTRONICS ROADMAP – 2025 / 2026 UPDATE

NextFlex and the field of hybrid electronics leverage a broad U.S. industrial base including the electronics industry and the high-performance printing industry, both well-established U.S. industrial and academic areas of strength. NextFlex members have developed a comprehensive roadmap by collaboration among industrial partners, academics, and government SMEs in a variety of fields. The roadmap topics include different facets of application-specific devices/components for technology demonstration as well as various aspects covering design, materials, process, equipment, and test development that would enable realizing advanced manufacturing capabilities to meet the overall vision of the Institute and the hybrid electronics ecosystem. The following areas are the focus of the Technical Working Groups that developed the roadmap:

- Manufacturing Thrust Area
  - Device Integration & Packaging
  - Materials
  - Modeling & Design
  - Printed Flexible Components & Microfluidics
  - Standards, Test & Reliability

- Technology Platform Demonstrators
  - Asset Monitoring Systems
  - Automotive
  - Flexible Power
  - Human Monitoring Systems
  - Integrated Array Antennas
  - Soft & Wearable Robotics

Successful proposals must align to the NextFlex Roadmaps, and all proposals should identify the Technical Working Group and roadmap elements to which they align. Access to the NextFlex Roadmaps is a benefit of NextFlex membership. Beginning in 2022, NextFlex has produced a public summary of the Hybrid Electronics Roadmap that is available to non-members and may be useful in formulating proposals. Non-member proposers are encouraged to consult with NextFlex as outlined later in this document or to partner with NextFlex members on proposals to ensure alignment.

Since technology transition and adoption through enabling manufacturing readiness is the primary mission of the Institute, only proposals in the TRL 4 to 7 and MRL 4 to 7 range will be considered for funding. Based on the gaps identified through the TWG roadmapping process, proposals in the following areas have been prioritized and will be considered for potential funding in PC 11.0.

SECTION 4. PROJECT CALL TOPICS

In this first part of PC 11.0, there are three Project Call topics, which aim to advance hybrid electronics technology and fill gaps identified by the TWGs in the Roadmaps. The outcomes of the projects that are selected are expected to have broad impact on both commercial and defense applications and to advance U.S. hybrid electronics manufacturing capability. All proposers are encouraged to build off developments from previous NextFlex project calls.

As the NextFlex community and hybrid electronics manufacturing matures and transitions into defense and commercial applications, there are opportunities to combine NextFlex development investments with other government agencies or commercial interests. To that end, proposals that bring other DoD agency funding for technology solutions to specific DoD requirements or direct funding from a separate commercial business unit will be viewed favorably during evaluation. Additional DoD agency funding can be executed through the NextFlex cooperative agreement or a separate agreement or contract.

A natural consequence of the maturation and technology transition of hybrid electronics is a shift to focus on reliability of the technical solutions and the importance of standards-based testing. All PC 11.0 proposals are encouraged to address these needs for reliability and standards within their project plans in a manner appropriate for the topic and specific proposal.

Table 2 presents a summary of Project Call 11.0 topics and the TWGs with which they align, either directly or indirectly.

Table 2: Project Call 11.0 topic summary

Topic #	Topic Description	Max Duration (months)	Max Funding *	Technical Working Group Alignment											
				Modeling & Design	Materials	Printed Components & Microfluidics	Device Integration & Packaging	Standard, Test & Reliability	Asset Monitoring Systems	Automotive	Flexible Power	Human Monitoring Systems	Integrated Array Antennas	Soft & Wearable Robotics	
11.1	Resilient Manufacturing of Hybrid Electronics and Printed Circuit Boards (OSD ManTech Funded)	15	$ 500k	O	X	X	O	X							
11.2	Demonstration of Hybrid Electronics for Installation Resiliency and Efficiency (OSD ManTech Funded)	15	$ 900k		O	O			X	X	X	O	X	X	
11.3	AI/ML-Enabled Materials and Process Data Infrastructure for Hybrid Electronics	15	$ 500k	X	X	X	O	X	O		O	O			
				X	Direct TWG Alignment										
				O	Indirect TWG Alignment										
		Total	**$ 1.9M**												

The objectives of these projects are to focus on developing and qualifying manufacturing processes, methods, or tools, or demonstrating hybrid electronic systems and subsystems identified as gaps via the roadmapping process and discussions with TWG leads, members, and government partners. The processes and the tools developed will have a considerable impact on the manufacture of cost-effective, reliable systems for a wide range of defense and commercial applications.

Technology transition to the manufacturing base is a key objective for NextFlex programs, including transfer of process knowledge or developed processes. As such, having demonstrated participation and support from a manufacturer and / or government transition partner strengthens a proposal. For example, a process development proposal from an R&D organization may include an original equipment manufacturer (OEM) or contract manufacturer as a team member, and a letter of support indicating that organization's interest in implementing the process. Similarly, a proposal that develops a capability of interest to a DoD stakeholders may include a letter describing the stakeholder's specific interests in the project. Although government partners cannot receive funding through the Project Call, , they can participate in the

performance of the project if separately funded. Transition partnerships may take many forms and the preceding examples of industry and DoD partnerships are meant for illustration only.

Any development of software tools should include licenses or provisions to allow NextFlex members and Institute personnel to access and use the tools for development purposes, and it is expected that third-party licensing needs or maintenance costs required to operate the tools will be considered by the proposal team and addressed as part of the proposal.

In the case of projects focused on process development, it is expected that those developments will be documented with enough detail that they are reliably replicable and that they may be included in manufacturing guidelines for relevant processes in the future. Processes or approaches developed under NextFlex Project Call funding must provide unencumbered use licenses for their implementation at the NextFlex Technology Hub to continue the advancement of the NextFlex ecosystem.

More specifically, these topics shall include, but are not limited to, the following deliverables:

1. Data (raw and processed) on materials, processes, performance, and reliability for sharing at quarterly reporting intervals following the acquisition of the data.
2. A flow chart of the process steps and design information (such as drawings, CAD files, etc.) for device fabrication or process repetition.
3. Relevant process information including:
    a. Resolution, thickness, and material properties (e.g., sheet resistance) that can be obtained with the developed recipe
    b. Tolerance and yield of components, along with a comparison to device manufacturing processes that are currently used in the industry
    c. Consistency of print quality (line edge roughness, loss or gain in dimension, uniformity in thickness and layer roughness) of the layer(s) in the device
    d. Consistency in device properties (resistance, capacitance, inductance, etc.) along with a comparison to similar devices that are commercially available
    e. Optimized print equipment parameters (print speed, ink volumes, ink viscosity, curing conditions, print environment, etc.)
    f. Mechanical constraints (e.g., tensile strength, bending) of the printed devices
4. Details of the method of test and measurement performed during development to establish TRL and MRL advancements.
5. Identification of the specific task and outcome that results in TRL and/or MRL advancements.
6. Cost model framework and associated assumptions for the proposed manufacturing technique.

In addition to reports and other deliverables just described NextFlex requests physical “hardware” deliverables from all projects, sufficient to demonstrate and showcase the development work completed in the project. These may take many forms, such as sample parts produced in a process development process, test coupons for new materials, functional systems or subsystems from platform demonstrator projects, etc. The proposed physical deliverables should be described in the proposal and may be the subject of negotiation for projects selected for award consideration. The rare case of projects not intending physical deliverables should discuss this with NextFlex during proposal development.

Proposals that focus on the development of technology platform demonstrators should describe the relevance of the application in sufficient detail that reviewers who are subject matter experts in hybrid electronics and other application areas can assess and compare proposals that address varying application areas. Generally, technology demonstrator projects may address quite disparate applications within a particular topic area, and as such the business case and relevance of the application is a technical merit factor. Technology demonstrator proposals shall also describe specifically the technical need and commercial value of hybrid electronics to this application area within the proposal’s innovative claims and commercial strategy sections.

Platform demonstrators should showcase the capabilities of novel technology solutions and clearly illustrate the value proposition of utilizing hybrid electronics manufacturing approaches. NextFlex cannot fund product development, however, proposers are encouraged to develop ‘product-like’ functional

demonstrators that achieve this goal. This refers to demonstrators that include necessary packaging, software/firmware, support, etc. and are polished and comprehensive exhibits of the technology. Proposers are strongly encouraged to also generate images and videos of demonstrators functioning to showcase their capabilities and provide them to the Institute and government partners.

The following section outlines the topic areas for PC 11.0. Each topic includes a maximum funding level and project duration; proposals requesting lower funding amounts and/or shorter timelines are welcome. Topics are organized into defined sub-topic areas, each accompanied by specific technical focus areas that describe the key challenges and outcomes of interest. These technical focus areas are intended to guide proposers toward priority needs identified through the roadmap and stakeholder input.

Proposals should clearly align to at least one sub-topic and address one or more of the associated technical focus areas. While proposers are not required to address every listed area, competitive proposals will demonstrate meaningful alignment with these defined needs and articulate how the proposed work advances the stated objectives of the topic. Alternative approaches that fall within the overall scope of the topic and address relevant manufacturing gaps may also be considered, provided they are well-justified and aligned with the intent of the topic.

Topic 11.1: Resilient Manufacturing of Hybrid Electronics and Printed Circuit Boards

Note: This topic has dedicated funding from DoD / OSD ManTech for inclusion in PC 11.0.

$500,000 maximum Institute funds / Up to an 15-month duration

This topic seeks proposals that advance efficient, resilient, and scalable manufacturing approaches for both hybrid electronics and traditional printed circuit boards (PCBs) through the adoption of digital, additive, and process-optimized manufacturing methods. Emphasis is placed on improving yield stability, reducing process variability, enhancing materials durability, and enabling scalable domestic production across one or both manufacturing domains, including relevance to modernization and capability expansion within the DoD Organic Industrial Base (OIB).

Proposed efforts should demonstrate measurable improvements in process control, repeatability, manufacturability, environmental performance, and/or domestic supply chain resilience. Projects should align validation activities with applicable industry and defense standards where appropriate and generate structured process and reliability data that support MRL advancement.

The examples outlined below are derived from the TWGs gap analysis and direct demand signals from industrial base and government stakeholders. Successful proposals will prioritize one of these areas, directly address cross-cutting barriers limiting scalable adoption of hybrid electronics, and demonstrate clear, measurable impact not only to the proposing organization(s), but to the broader industrial base.

a. Additive and Hybrid Fabrication Workflows for PCB and Hybrid Electronics Production

Development of semi-additive, fully additive, roll-to-roll, or hybrid circuitization approaches that reduce or eliminate high-chemical-intensity etching, plating baths, and / or subtractive processing steps. Projects may address conductor formation, dielectric deposition, multilayer stacking, inline metrology, or pattern transfer methods compatible with existing PCB infrastructure or scalable hybrid electronics manufacturing processes.

Potential projects should address one or more of the following areas of need:

- **i.** Establishing standardized metrics for ink/substrate adhesion and electrical stability
- **ii.** Defining environmental control parameters to improve uniformity and repeatability
- **iii.** Improving layer-to-layer registration and implementing inline metrology for verification
- **iv.** Integrating additive processes with pick-and-place or mixed manufacturing assembly flows
- **v.** Demonstrating yield stabilization and reduced batch-to-batch variability in pilot-scale builds

b. Biomanufactured and Biobased Materials for Circuit Fabrication

Development and validation of biologically derived or bio-fabricated solvents, conductive inks, dielectrics, substrates, laminates, encapsulants, or structural materials suitable for PCB and hybrid electronics production. Efforts should address materials stability, conductivity performance, environmental durability, and compatibility with scalable manufacturing.

Potential projects should address one or more of the following areas of need:

i. Scalable additive conductor manufacturing approaches with improved conductivity consistency
ii. Shelf-life stability and printability retention over defined storage intervals
iii. Substrate or encapsulant durability under humidity, thermal cycling, chemical exposure, or mechanical stress
iv. Integration of domestically available feedstocks to reduce supply chain risk

c. Recycling, Upcycling, and Waste Stream Reduction in Circuit Manufacturing

Recovery and reintegration of materials from PCB fabrication or end-of-life electronics into new manufacturing workflows. Projects should reduce environmental burden while maintaining or improving electrical and mechanical performance.

Potential projects should address one or more of the following areas of need:

i. Reduction of scrap rates through improved process control and variability management
ii. Reduced water and solvent consumption relative to conventional subtractive PCB baselines
iii. Reintegration of reclaimed materials without degradation of functional performance
iv. Structured reporting of environmental, yield, and reliability performance data to enable benchmarking across the NextFlex membership

Topic 11.2: Demonstration of Hybrid Electronics for Installation Resiliency and Efficiency

Note: This topic has dedicated funding from DoD / OSD ManTech for inclusion in PC 11.0.

$900,000 maximum Institute funds / Up to an 15-month duration

Note: Platform demonstrators should showcase the capabilities of novel technology solutions and clearly illustrate the value proposition of utilizing hybrid electronics manufacturing approaches. NextFlex cannot fund product development, however, proposers are encouraged to develop 'product-like' functional demonstrators that achieve this goal.

Proposals that build on previous NextFlex-funded efforts to demonstrate a transitionable capability are strongly encouraged. The design information for the *NextFlex-developed 'A21' flexible microcontroller device can be made available to NextFlex members to serve as the basis for demonstrator development. For additional information regarding the specifications and capabilities of the A21, please contact proposal@nextflex.us.*

Proposals that include an engaged DoD stakeholder will be given strong preference. Examples of engagement include: a signed Memorandum of Understanding (MOU), a co-development partner from a service lab, requirements from a representative of a Portfolio Acquisition Executive (PAE) or Program Executive Office (PEO), etc.

This topic seeks proposals that demonstrate the use of hybrid electronics in mission-relevant applications that measurably improve installation resiliency, operational efficiency, and readiness. The reduced size, weight, and power (SWaP) capabilities of hybrid electronics enable distributed sensing, embedded intelligence, conformal antenna integration, flexible power architectures, and lightweight interconnect strategies in ways not achievable with conventional rigid systems. These capabilities directly address documented performance gaps in long-duration sensing, environmental survivability,

interconnect durability, integrated power management, and conformal RF integration across defense-relevant platforms and infrastructure.

Emphasis is placed on product-like demonstrators that leverage hybrid electronics to reduce sustainment burden, improve inspection timelines, lower life cycle cost, and strengthen operational awareness across DoD installations and maintenance activities, including depot-level and sustainment operations executed within the OIB. Demonstrators should validate performance under mission-relevant environmental and mechanical conditions and generate structured reliability and performance data suitable for transition planning and MRL progression.

Projects should clearly articulate the use-case being addressed and quantify the resulting impact to readiness, cost reduction, asset availability, inspection cycle time, logistics visibility, or infrastructure efficiency, particularly where improvements enhance sustainment throughput and operational effectiveness.

The examples outlined below are derived from the TWGs gap analyses and direct demand signals from the industrial base and government stakeholders. Successful proposals will prioritize these areas and deliver a 'product-like' demonstrator that clearly showcases a novel capability while demonstrating measurable impact not only to the proposing organization(s), but to the broader industrial base.

a. Sustainment, Inspection, and Repair Technologies

Hybrid electronics-enabled systems that improve sustainment and repair of platforms and infrastructure, including aircraft, ground vehicles, ships, runways, bridges, fuel systems, and facilities. Aging platforms, increasing depot backlogs, and workforce constraints are driving demand for embedded sensing and conformal inspection capabilities that reduce teardown, accelerate return-to-service timelines, and decrease recertification burden.

Examples include embedded or conformal inspection technologies, non-destructive evaluation aids, condition verification tools, repair validation sensors, and distributed inspection nodes that demonstrate one or more of the following:

- **i.** Stable signal performance under combined mechanical strain and environmental stress
- **ii.** High-vibration survivability suitable for aerospace and ground vehicle environments
- **iii.** Strain-tolerant printed conductors and durable rigid–flex interconnect architectures
- **iv.** Quantifiable reduction in maintenance labor hours, inspection cycle time, or unplanned downtime

b. Autonomous and Intelligent Systems

Hybrid electronics devices integrated into intelligent or semi-autonomous systems, with particular emphasis on Unmanned Aerial Systems (UASs), to enhance installation operations, inspection capability, and logistics resilience. Workforce limitations, contested environments, and distributed operations are increasing demand for lightweight, conformal sensing and communications systems integrated directly into autonomous platforms.

Examples include low-SWaP sensing and communications modules embedded into UAS platforms; conformal or structure-integrated antennas and sensor arrays; distributed edge-processing nodes enabling onboard predictive maintenance assessment; and lightweight hybrid sensing architectures that support autonomous inspection of runways, infrastructure, vehicles, and facilities while reducing reliance on centralized infrastructure. Demonstrators should show one or more of the following:

- **i.** Conformal antenna integration with minimal performance degradation under strain
- **ii.** Stable multilayer RF and interconnect performance under temperature cycling
- **iii.** Lightweight distributed control and sensing modules with limited added system mass
- **iv.** Integrated flexible power architectures enabling sustained autonomous operation

c. Low-Cost IoT Devices for Logistics and Supply Chain Visibility

Thin, lightweight hybrid electronics labels or sensor nodes integrated into shipping containers, pallets, packaging, or mission-critical assets for location, temperature, shock, tamper, or cold-chain monitoring. Distributed and contested logistics operations require persistent, low-cost monitoring solutions that improve asset visibility, reduce loss and spoilage, and strengthen decision-making across complex supply chains. Successful proposals in this area will focus on how the technology solution can be operationalized in a relevant environment.

Solutions should demonstrate one or more of the following:

i. Persistent low-power sensing suitable for long-duration deployment
ii. High-vibration survivability in transport environments
iii. Efficient integrated power management for distributed nodes
iv. Environmental durability maintaining signal stability across extended logistics cycles

d. Asset and Structural Health Monitoring

Distributed hybrid electronics sensing architectures that provide persistent monitoring of structure or asset condition. Installations and operational platforms require long-duration, low-power monitoring solutions that support condition-based maintenance and reduce unplanned downtime in both depot and expeditionary settings.

While the promise of the value of these potential capabilities is clear, the path to broad adoption is impeded by unmet requirements to demonstrate qualification and certification of the technology for use in key application domains. Proposals in this area must demonstrate an understanding of how certification and qualification occur in the proposal application domain, leading to technology transitions.

Examples of interest include embedded strain, vibration, temperature, corrosion, or degradation monitoring for infrastructure and operational platforms; large-area sensor networks for depots and logistics hubs; or long-duration, low-power nodes enabling persistent condition awareness that demonstrate one or more of the following:

i. Long-duration operation with low-power distributed architectures
ii. Integrated flexible energy storage with validated charge/discharge stability
iii. Maintained sensor accuracy under mechanical strain and thermal cycling
iv. Signal integrity under humidity, temperature, and combined stress environments

Topic 11.3: AI/ML-Enabled Materials and Process Data Infrastructure for Hybrid Electronics

$500,000 maximum Institute funds / Up to an 15-month duration

Over multiple project calls, substantial technical data has been generated across hybrid electronics materials, processes, reliability testing, yield performance, and environmental validation. However, much of this information remains distributed across individual technical reports, limiting accessibility, comparability, and reuse. This topic seeks to implement secure artificial intelligence and machine learning tools capable of mining, parsing, structuring, and organizing existing project call technical report data into a standardized materials and process database framework. Emphasis is placed on creating a reusable, searchable, and structured data infrastructure that accelerates technology maturation and cross-project learning while maintaining strict data governance.

Data security is imperative. Proposed solutions must incorporate controlled access mechanisms, protection of proprietary and controlled information, and clearly defined data segmentation protocols to prevent unauthorized disclosure. Proposers must work closely with NextFlex and appropriate government partners to define the database architecture, data schema, access controls, and implementation strategy to ensure alignment with programmatic requirements, data rights considerations, and long-term sustainability.

The examples outlined below are derived from the TWGs gap analysis and direct demand signals from industrial base and government stakeholders. Successful proposals will prioritize these areas, directly address cross-cutting barriers limiting scalable adoption of hybrid electronics, and demonstrate clear, measurable impact not only to the proposing organization(s), but to the broader industrial base.

a. Secure AI/ML Parsing and Data Structuring of Technical Reports

Development of AI/ML workflows capable of extracting structured materials properties, process parameters, yield metrics, reliability data, and environmental validation results from existing technical reports to support standardized documentation and benchmarking.

Priority technical areas include:

- **i.** Automated extraction and normalization of process parameters tied to documented performance metrics
- **ii.** Structured capture of adhesion, conductivity, registration, and interconnect stability data
- **iii.** Tagging of environmental validation results including combined stress and mission-relevant test profiles
- **iv.** Creation of traceable linkages between materials, processing conditions, and measured reliability outcomes
- **v.** Auditable workflows ensuring traceability to source documentation

b. Materials and Process Database Architecture Development

Design and implementation of a scalable database framework that organizes materials systems, processing conditions, inspection data, yield performance, and reliability outcomes into standardized schemas.

Priority technical areas include:

- **i.** Standardized parameter documentation across builds to support process repeatability benchmarking
- **ii.** Structured storage of qualification matrices and environmental stress validation results
- **iii.** Searchable failure-mode datasets enabling cross-project reliability comparison
- **iv.** Integration of manufacturing readiness indicators aligned with documented process maturity metrics
- **v.** Tiered access permissions aligned with proprietary and controlled data requirements

c. Secure Data Governance, Access Control, and Implementation Framework

Development of a secure data management architecture incorporating role-based access control, data compartmentalization, encryption, logging, and audit mechanisms to ensure protection of proprietary, competition-sensitive, and export-controlled information.

Priority technical areas include:

- **i.** Segmented data architecture enabling controlled sharing of benchmarked performance metrics
- **ii.** Governance policies for data ingestion, validation, normalization, and anonymization where appropriate
- **iii.** Implementation plans supporting long-term secure hosting and maintainability
- **iv.** Structured reporting formats that enable benchmarking while preserving data rights protections

SECTION 5. PROPOSAL SUBMISSION PROCESS

All proposers, including experienced NextFlex project teams, should pay attention to this section, as changes have been made to certain proposal elements and the evaluation process and structure over the last several project calls.

5.1 Project Call 11.0 Timeline

Project Call 11.0 will utilize a single step proposal process. Proposals are to be submitted directly with no pre-proposal or white paper stage

To ensure that proposal teams have an opportunity to receive feedback from NextFlex on their project concepts, teaming, roadmap and DoD priority alignment, and other relevant criteria, proposers are **strongly encouraged** to contact NextFlex to schedule a conference call with Institute representatives. These pre-submission consultation calls are a valuable opportunity for all proposers. For proposers that are new to a NextFlex Project Call, this step may be particularly helpful in understanding the nuances of proposals and reviews within the Institute framework. To schedule a pre-submission consultation, please contact proposal@nextflex.us.

Submitted proposals undergo a rigorous multi-tier evaluation as the selection process. Key steps and target dates are outlined in the table below.

Project Call Announcement and Posting	03/19/2026
Optional PC 11.0 Proposers Day and Teaming Event (Virtual)	03/26/2026
First Date for Optional Pre-submission Consultation	03/30/2026
Proposal Online Cover Sheet Due	05/13/2026
Proposal Submission Deadline	**05/20/2026**
Approximate Technical Council Review	Mid July
Approximate Governing Council Review	Late July

5.2 Required Proposal Elements

A complete proposal shall consist of three separate files:

1. Technical Proposal – following the format and content guidelines below in Sections 5.3 and 5.4
2. Summary PowerPoint Slide – for review purposes, this is considered part of the Technical Proposal although it is submitted as a separate file. Additional information and template link are found in Section 5.3.
3. Budget Workbook (Cost Proposal) according to the NextFlex provided template, to be submitted in Microsoft Excel format. Additional information may be found in Section 5.5.

Proposals will be accepted online at https://nextflex.formstack.com/forms/pc11_proposal_submission until **5:00 PM PACIFIC TIME** on **May 20, 2026**.

5.3 Technical Proposal Format Guidelines

To maintain consistency through submission, review, and approval processes, please follow these guidelines:

Submission. The proposer shall submit one (1) word-processed electronic copy of their proposal via online submission form at https://nextflex.formstack.com/forms/pc11_proposal_submission.

Figures, Graphs, Images, and Pictures. Figures and tables must be numbered and referenced in the text by that number. They should be of a size that is easily readable and may be in landscape orientation. They must fit on an 8.5 by 11-inch paper size.

Font. Proposals are to be prepared with easy-to-read font (such as Times New Roman or Arial), 10-point minimum), single-spaced. Smaller font may be used in figures and tables but must be legible.

Page Layout. The proposal document must be in portrait orientation except for figures, tables, graphs, images, and pictures. Pages shall be single-spaced, 8.5 by 11 inches, with at least one-inch margins on all four sides of each page.

Page Limit. The main body is limited to 15 pages for the proposal. The page limit includes all required sections of the proposal except as indicated in Section 5.3. Pages that exceed these guidelines may not be reviewed.

Page Numbering. Number pages sequentially within each major section of the proposal (frontmatter, proposal content, appendices).

Summary PowerPoint Slide. Each team is required to provide a single PowerPoint slide for their proposal which outlines proposed budget, funding, duration, objective, and deliverables, to be used by the Technical Council while reviewing the projects for selection. Graphics or other relevant and impactful materials are often helpful in this regard. A template for this slide may be downloaded at: https://www.nextflex.us/project-call/project-call-11-0/. Proposals that are selected for funding will be required to provide a version of this slide for public release as part of the contracting process.

5.4 Technical Proposal Content Guidelines

The proposal table of contents and guidelines are provided in this section. Please follow instructions in Section 5.2 for format and other requirements. Use the standardized cover page format (Appendix A). The table of contents for the proposal is outlined below. If required, additional tables may be included, but may not be used to artificially exceed the proposal page length. Please ensure that all table or figure references include a clear numbering system and are cross-referenced in the proposal text. Please ensure that proposals clearly identify the current capability and the quantitative target specifications that will determine success of the project.

Proposals must define milestones that are tangible, measurable, and demonstrable. The specifications of each milestone achievement should be clearly defined as well as the starting state of the art for the same characteristics that the project is improving upon. Examples of tangible milestones may include performance specifications achieved by physical samples, written reports containing collected data, provision of design files, live demonstrations of functionality, etc.

Please note that this is not a typical government grant or contract opportunity. NextFlex staff are available and encourage clarifying questions and will provide guidance during the process of the proposal preparation.

Content: The proposal shall comply with the following content and structure. Importantly, the budget sheets must be filled out completely and consistent with format provided.

Proposal Table of Contents

Frontmatter – Not Included in the Page Count	
Page I	Cover Page (see Appendix A)
Page II	Table of Contents
Page III-IV	Executive Summary: A succinct summary of **no more than two pages** clearly articulating the big picture problem being addressed, proposal objectives, relevance to hybrid electronics, approach to address all critical technical and non-technical aspects, expected outcome and overall cost/cost share information.

Pages 1-15: Proposal Content
There is a 15-page maximum for the proposal, excluding appendices and PowerPoint Slide Project Description; the page count in each section is for guidance. Total number of pages is more important than the page count in each section.

Proposal Content – 15-Page Maximum for Sections 1-7; Sections 8-9 are Excluded from Page Count	
Suggested Length	**Section and Contents**
~1.5 Pages	**1. Background and Need** 1.1. Identify the Hybrid Electronics Opportunity and Proposed Solution 1.2. Describe Background, Current State-Of-The-Art, and Alignment to NextFlex TWGs and DoD Critical Technology Areas* and Priorities 1.3. Addressed Roadmap Gap (or manufacturing gap not previously identified) and Problem Definition
~4 Pages	**2. Technical Objectives, Scope, and Approach** 2.1. Technical Objectives 2.2. Technical Scope and Approach 2.3. Innovative Claims† 2.4. Performance and Reliability Metrics/Standards 2.5. Key Target Specifications
~5 Pages	**3. Work Plan** 3.1. Project Schedule 3.2. Detailed Description of Milestones, Tasks, and Deliverables 3.3. Project Risk Assessment and Mitigation Plan 3.4. Project Management Approach, Roles, and Relationship of Key Personnel
~2 Pages	**4. Commercialization Strategy** 4.1. TRL/MRL Assessment (current state of the technology, expected level to be achieved, and explanation of how the proposed work will advance the TRL/MRL) 4.2. Market Analysis and Business Case for Proposed Technology (including relevance to the hybrid electronics ecosystem)‡ 4.3. Manufacturing Partners and Approach 4.4. Technology Transition / Commercialization Plan 4.5. Tool Accessibility to NextFlex Members and Broader Ecosystem (this section is required only for proposals that are developing equipment/tools for manufacturing or test and software such as design or modeling tools) 4.6. IP: Existing Portfolio and Future Strategy (related to the proposal topic)
~1 Page	**5. Budget Justification and Cost Share** 5.1. Summary breakdown of costs (labor, materials, travel, etc.) by project team member. Sources of funding including NextFlex funds, participant cost share, 3rd party cost share, and any other sources. This section provides budgetary information for the technical reviewers. Use the table below as the basis for summarizing the budget breakdown in this section. Add additional rows and columns, as needed.

*The DoD has described technology focus areas critical for ensuring continued advantage over potential adversaries. If applicable, proposals should call out and clearly describe how the project aligns with one or more of these focus areas. (https://www.cto.mil/cta/)

† For demonstrators, clearly define the value to the ecosystem, long-felt need, and justification for why hybrid electronics technology is appropriate/advantageous.

‡ For demonstrators, describe the defense and/or commercial need / value of the hybrid electronics solution for this application.

	<table><tr><th>Organization</th><th>NextFlex Funds</th><th>Cost Share (Incl. Type/Source)</th><th>Total</th></tr><tr><td>*Lead Org*</td><td></td><td></td><td></td></tr><tr><td>*Partner Org 1*</td><td></td><td></td><td></td></tr><tr><td>*Partner Org 2*</td><td></td><td></td><td></td></tr><tr><td>Total</td><td></td><td></td><td></td></tr></table> **Do not include any proprietary rate information (labor, G&A, overhead rates, etc.) in this section; appendix includes detailed costing.** 5.2. Value and Quality of Cost Share
~1.5 Pages	**6. Capability to Meet Technical and Business Goals** 6.1. Key Personnel Experience and Qualifications 6.2. Prior Work Toward This Specific Effort 6.3. Relevant Facilities and Equipment Infrastructure (pertinent to the proposal)
Brief Statement	**7. Education & Workforce Development** 7.1. Education and Training Component of the Proposal. Proposals that include substantial education or workforce development activities (e.g. beyond inclusion of graduate or undergraduate student researchers/developers to carry out technical tasks) should expand this section.
As Needed; Excluded from Page Count	**8. Appendix** 8.1. Bio-sketches 8.2. Facilities and Infrastructure Detail Relevant to the Proposal 8.3. Technical References and List of Patents 8.4. Letters of Support, MOUs
Excluded from Page Count	**9. Single Page PPT Slide Project Description (format provided)***

5.4 Cost Proposal Guidelines

Proposal cost calculations shall be in the Excel format provided; the spreadsheet must be submitted as a separate file with the submission, not included in the Technical Proposal. For clarity, the technical proposal Section 5.1 includes a high-level budget summary that technical reviewers will use to evaluate the proposal; the cost proposal is used for detailed evaluation by NextFlex staff and government advisors. Cost proposals are not shared with the Technical Reviewers.

The cost proposal spreadsheet may be downloaded at https://www.nextflex.us/project-call/project-call-11-0/ Additional worksheets should be added to the Workbook for additional partner organizations.
Cost proposals must include labor (by staff position / role, not by individual name), materials, travel, and all other direct expenses, and overhead, including overhead rates, each divided by source of funds. Questions about cost proposals including submission of rate information should be addressed to NextFlex at proposal@nextflex.us.

SECTION 6. ADMINISTRATIVE TOPICS

6.1 Confidential Information

It is recognized that it may be desirable to include information that is considered confidential and proprietary by the submitter to fully and effectively convey the technical merits of the proposal. All submitted proposals are distributed for the purpose of review to a slate of reviewers. Besides NextFlex staff, the majority of NextFlex's proposal reviewers are NextFlex members, and as such, they are bound to customary

confidentiality provisions (no less than reasonable care standard, marking requirement or written confirmation for oral disclosure, standard exclusions such as for publicly available information) via NextFlex's IP Policy to maintain the confidentiality within the NextFlex membership (relevant IP Policy sections will be made available upon request). Representatives of the U.S. Government also serve as proposal reviewers. NextFlex reserves the right to engage other persons or entities as part of the proposal review process (e.g., third-party SMEs), in which case NextFlex will require such reviewer to enter into a special purpose non-disclosure agreement. Please keep the foregoing in mind when determining the information to provide in your proposal. It is recommended that the included confidential or proprietary information be clearly marked and be limited to the minimum necessary to convey the highlights of the technical approach.

Additionally, proposers must refrain from including Export Controlled information in their submissions. If a proposer believes that inclusion of Export Controlled information is required to fully respond to the technical topic or to fully convey the merits of their proposal, they should contact NextFlex by email to proposal@nextflex.us to discuss this fact no later than the online cover sheet submission deadline; alternative submission and review procedures may be required.

6.2 Financial and Cost Share Requirements

Development agreements will be awarded as cost reimbursement, not-to-exceed contracts, with periodic payments to be made linked to achievement of milestones as presented in the proposal. If the proposer's organization has a US government-approved rate structure, please use it. The methods used to value "cost sharing" must be the same as those used to value the full project costs. All developers are expected to have a government approved or industry standard accounting system by which actual project costs are tracked and reported. This is an absolute requirement to be sure that cost share obligations are met. Overall guidance on the working principles and requirements of cost-share (in-kind cost share, and cash and cash equivalent cost share), including various regulations governing federally funded programs are given in a separate document, "Cost Share Definitions and Guidance," available at https://www.nextflex.us/project-call/project-call-11-0/.

6.3 Work Requirements

To submit a response to PC 11.0 and to be subsequently considered for an award, the following requirements must be met:

- Proposal teams should include at least one corporate/industrial organization and are encouraged to be industrially led when appropriate.
- The company or composite team of companies/government labs/academics must have a significant presence in the US in the form of R&D activities and/or manufacturing. One hundred percent of the work activity (funds) must be spent within the United States operations.
- The company or companies must be committed to making available the developed products and providing to NextFlex and its Members on a right-of-first acceptance basis. Applied research conducted by universities will be considered and does not need to meet this requirement. However, in the latter case, a pathway to commercialization must be envisioned and described.
- Process development projects should include sufficient documentation that the method is replicable at the NextFlex Technology Hub in San Jose, CA, or member companies' facilities or both as appropriate.
- Test methods, materials data, or design tools should be foundational and available for incorporation into tools for the advancement of hybrid electronics manufacturing and not limit collaboration.
- The total project funds must be matched at a minimum of 1:1. Teams may determine how to divide that requirement among their members. The cost share is defined in the Participation Agreement to include matching share of the development cost in cash and in-kind contributions, e.g., labor and materials, of at least 50 percent.

6.4 Membership Requirement

To qualify for funding awards, lead organizations on projects that are selected for an award, as well as the other performers on their project team that will receive funding, who are not already members of the Institute, must join NextFlex at the appropriate membership Tier (not Observer Level or Associate Member) before a development agreement can be finalized with the project lead. Suppliers from whom standard parts, components, or materials are acquired, such as those with a catalog part number or industry standard supply chain (e.g., build-to-print part) are exempted from this requirement; this exemption may include experimental grades of materials, components, or parts that are provided at competitive fair market price for the purchased units, not paying for the full development cost of that experimental item. It is the responsibility of the project lead(s) to communicate this requirement to their respective partners and coordinate their membership process with NextFlex. Potential members can find out more at: https://www.nextflex.us/membership-inquiry-form/.

SECTION 7. PROPOSAL EVALUATION CRITERIA

All proposals are evaluated using a three-step process.

1. Review by Subject Matter Experts
2. Selection Recommendations from the NextFlex Technical Council
3. Selection by the NextFlex Governing Council

Details of these steps are found below.

Proposals are assigned to slates of technical reviewers comprising subject matter experts (SMEs) from among NextFlex industry, government, and academic institution members. In rare cases, NextFlex may engage 3rd party SMEs who are not NextFlex members as part of the review process.

Reviewers independently review the technical proposals and provide feedback to NextFlex according to proposal evaluation criteria described below. Based on the quantitative and descriptive feedback from the reviewers, NextFlex formulates a set of recommendations that are considered by the NextFlex Technical Council, which through voting creates a set of recommendations for selection that is sent to the NextFlex Governing Council. Infrequently, the Technical Council may recommend certain proposals subject to modifications. The NextFlex Governing Council, comprising representatives of certain NextFlex industry, academic, and government member organizations, has final selection authority and considers the recommendations from the Technical Council in voting its recommendations.

In soliciting proposals, NextFlex plans to provide and administer funding that must be matched (1:1 minimum) with funds in the form of cash and in-kind contributions provided by the recipients to cover the total project cost. It is not a requirement that each team member demonstrates a cost share at a minimum of 1:1. However, the entire project must be cost-shared at least 1:1, and ratios greater than 1:1 are highly encouraged.

In responding to this solicitation, partnering among industrial companies or industrial company/R&D organization/university/government teams is very strongly encouraged. Individual company responses may be appropriate where company size, breadth, and expertise are sufficient to effectively cover all areas (e.g., technical resources, financial stability, and market presence) critical to the successful delivery of the demonstrator, prototypes, processes, or material proposed. Engagement with industry partner(s) will strengthen the value of the submission.

Pre-submission Consultation with NextFlex: All proposers are *strongly encouraged* to schedule a pre-submission consultation with NextFlex while developing their proposal. The purpose of discussing proposals with NextFlex prior to official submission is to receive feedback on all aspects of the proposal, including technical approach, partnering, connection to previous NextFlex projects, etc. This consultation is meant to strengthen the competitiveness of the proposal. It is the responsibility of each proposing team

to decide how to incorporate or not incorporate the feedback. This consultation does not factor into the proposal evaluation.

Proposal Evaluation: Reviewers assess proposals based on the criteria outlined in the table below, considering overall funding worthiness, pros, and cons. The 14 criteria are grouped into Technical Merit & Transition Potential (criteria 1–8) and Non-Technical Factors (criteria 9–14). Scores within each category are averaged to generate a Technical Score and a Non-Technical Score, with combined reviewer scores producing both average scores and a Technical Ranking. Project selection primarily depends on the Technical Score and Ranking, while the Non-Technical Score and reviewer feedback help differentiate closely rated proposals and identify outliers. Ultimate selection relies on the numerical scores, descriptive reviewer feedback, and balance of the project portfolio.

Proposal evaluation criteria, aligned with the proposal Table of Contents, are detailed in the table below. Appendix D provides guidelines for submitters and reviewers on relevant information and supporting details.

Reviewer scores and comments will be compiled, ranked, and prioritized for the Technical Council, which may request modifications before making recommendations to the NextFlex Governing Council. Upon approval, proposals proceed to Development Agreements before funds are awarded. If the lead developer or partners are not NextFlex members, they must also sign a Participation Agreement.

During the final selection process, NextFlex may engage with proposers regarding terms, conditions, specifications, deliverables, schedule, or other relevant factors contained in the proposal prior to awarding contracts. All awards are contingent upon continued availability of US government funding and are subject to mutually agreeable terms and conditions.

Section	Section Title	Criteria
1.0	Background and Need	(1) Problem statement, innovative solution, and potential impact on technical gap and/or DoD priorities
2.0	Technical Objectives	(2) Technical scope and approach
		(3) Logical technical plan; key deliverables and specifications
3.0	Work Plan	(4) Project organization
		(5) Probability of success
4.0	Commercialization Strategy	(6) Business case, value proposition
		(7) Manufacturing approach
		(8) Technology transition potential
	Manufacturing Readiness and Accessibility	(9) MRL/TRL assessment
		(10) Tool accessibility (for proposals developing tool hardware and software proposals only)
5.0	Budget Justification and Cost Share	(11) Cost and cost realism
		(12) Value and quality of cost share
6.0	Capability to Meet Technical and Business Goals	(13) Experience of personnel and quality of relevant facilities
7.0	Education & Workforce Development	(14) Quality of EWD section

Proposals that include use of the NextFlex Technology Hub should articulate the value proposition of this partnership to the project. Utilizing the Technology Hub is not an evaluation criterion. Technology Hub utilization in a proposal may be included in context with technical strategy leveraging state-of-the-art hybrid electronics capabilities, commercialization strategy, industry-relevant transition of manufacturing

processes, and demonstrating manufacturing gaps. Any proposal team intending to utilize the Technology Hub in their project should engage NextFlex about this well ahead of proposal submission (as they would any other partner). Proposers needing introductions to the appropriate Technology Hub staff can request introduction by email to proposal@nextflex.us. All projects are encouraged to leverage the NextFlex technical staff expertise.

In support of NextFlex's dual mission to (1) promote development and U.S. manufacturing of hybrid electronics and (2) support DoD technology transitions, alignment of projects to DoD Critical Technology Areas or priorities will be considered (as described above) in the evaluation of proposals. This alignment may be a factor in the consideration of proposals by the Technical Council and Governing Council. Partnering with DoD labs or other DoD components is allowed and encouraged, however NextFlex funds cannot be paid to DoD.

Education & Workforce Development: Establishing a domestic manufacturing ecosystem in hybrid electronics will require not only the development of new manufacturing processes, but also training a workforce to design and manufacture hybrid electronic products. To that end, proposals that include an Education & Workforce Development (EWD) component that is well-integrated into the technical work and geared toward training tomorrow's workforce, retraining today's workforce, and/or K-12 STEM outreach activities are favorably considered. EWD may include, but is not limited to, undergraduate and graduate student contributions to projects, internships, microelectronics course development at community colleges or universities, short course development, the development of STEM programs, etc.

SECTION 8. CONTACT INFORMATION

Communication and questions during the proposal period and submission of proposals should be directed by email to proposal@nextflex.us.

SECTION 9. REFERENCE DOCUMENT KITS

All the following seven (7) reference documents are in the Project Call Reference Documents section of the PC 11.0 webpage (https://www.nextflex.us/project-call/project-call-11-0/):

a. Project Call 11.0 Guidebook
b. Project Call 11.0 FAQ
c. Hybrid Electronics Technology Roadmap Summaries
d. MRL/TRL Definitions
e. Cost Calculations Template
f. Cost Share Definitions and Guidance
g. Summary PPT Submission Template

Additional membership and submission information is available at the following locations:

h. Membership (https://www.nextflex.us/membership-inquiry-form/)
i. Online Cover Sheet (https://nextflex.formstack.com/forms/pc11_cover_sheet) – Proposal Cover Sheet must be submitted by **May 13, 2026.**
j. Online Submission Form (https://nextflex.formstack.com/forms/pc11_proposal_submission) – Proposal must be submitted by **May 20, 2026**.

SECTION 10. GLOSSARY OF TERMS

Abbreviation	Term
A21	NextFlex A21 Flexible Microcontroller Device
AI/ML	Artificial Intelligence / Machine Learning
CAD	Computer-Aided Design

COTS	Commercial Off-the-Shelf
CTA	Critical Technology Areas
DoD	Department of Defense
EMS	Electronic Manufacturing Services
EWD	Education & Workforce Development
G&A	General & Administrative (Costs)
IC	Integrated Circuit
IoT	Internet of Things
ISR	Intelligence, Surveillance, and Reconnaissance
MII	Manufacturing Innovation Institute
MOU	Memorandum of Understanding
MRL	Manufacturing Readiness Level
NIH	National Institutes of Health
NSF	National Science Foundation
OIB	Organic Industrial Base
OEM	Original Equipment Manufacturer
OSD	Office of the Secretary of Defense
PAE	Portfolio Acquisition Executive
PCB	Printed Circuit Board
PEO	Program Executive Office
PWB	Printed Wiring Board
RF	Radio Frequency
ROM	Rough Order of Magnitude
SBIR	Small Business Innovation Research
SMEs	Subject Matter Experts
SSO	Standards Setting Organization
STTR	Small Business Technology Transfer
SWaP	Size, Weight, and Power
TRL	Technology Readiness Level

SECTION 11. APPENDICES

Appendix A: Cover Sheet Template

The chart below is to help you anticipate what information will be requested for your online cover sheet submission. Submission of cover sheets is required by the specified date to allow NextFlex to anticipate proposals that will be received and pre-align reviewers to facilitate timely proposal review. Estimated (ROM) project costs are required with the online cover sheet; it is expected that proposal teams may still be finalizing proposals and budgets at the time of the online cover sheet submission. Updated and final costs must be provided with the proposal submission.

To generate and submit an online cover sheet, please fill out the form:

https://nextflex.formstack.com/forms/pc11_cover_sheet

NextFlex PC 11.0 Cover Sheet Template	
Project Title	
Date of Submission	
Project Leader	
Organization, Department, and Address	
UEI Number	
Project Leader's Phone Number	
Project Leader's Email Address	
Industry Partner / Subcontractor Organization(s)*	Provide full name, location, and other details
Non-Industry Partner / Subcontractor Organization(s)†	Provide full name, location, and other details
Supplier Organization(s)‡	Provide full name, location, and other details
Project Topic Category	
MRL Level – Start	
MRL Level – Finish	
TRL Level – Start	
TRL Level – Finish	
NextFlex Membership Status and Level	
Estimated Total Project Cost:	$
Estimated Cost Share (in-kind, labor, material, etc.)	$
Estimated Cost Request from NextFlex	$
Project Duration (Months)	

* Industry Partner / Subcontractor Organizations are companies with whom the lead proposer organization is collaborating on the development work. This does not include suppliers of COTS components.
† Non-Industry Partner / Subcontractor Organizations are organizations (e.g. Universities) that are not for-profit companies.
‡ Supplier Organizations are other organizations that will *meaningfully contribute* to the project but that will not carry out funded development work. This may include, for example, key suppliers of COTS parts or services.

Appendix B: Instructions for Filling Out Proposal Cost Calculations Excel Workbook

There are specific requirements for planning and tracking proposal and project spending when receiving federal funding for Institute projects. To support those requirements, please lay out the project financials in the provided format. While budget details will be entered into the Excel tables provided, the following should serve to clarify what needs to be documented and how:

Overall the following areas are important for the Institute to understand:

- Total project cost
- Total cost share, including percent and amount of funding requested from NextFlex
- Type of costs
- In-kind contributions and types thereof
- Hours and rates for labor
- Any equipment purchases planned
- Materials purchases
- Travel expenses

In addition to detail on the above, you must provide spending by calendar year for which the project operates and a breakdown by lead and partners.

Therefore, the following explanation may be helpful.

The spreadsheet includes columns for five budget quarters. PC 11.0 topics are limited to five quarters; do not plan a budget longer than the allowed maximum duration for the topic proposed.

Add additional “Project Detail” and “Cost Detail” tabs for each partner on the project, and please make sure to maintain one “Project Detail Total” and “Cost Detail Total” tab which summarizes the partner breakdown.

The primary objective of this supporting workbook for the project proposal is to ensure that the review process can adequately identify all details of the proposal. Proposals that advance to funded projects will be subject to further documentation and record retention requirements which will be provided in detail to the project lead at that point in time.

If the lead or any partners of the proposal team have audited indirect rates for labor, please use those.

If there are any additional questions on how to prepare the cost calculations workbook, proposers may contact proposal@nextflex.us for further clarification.

Appendix C: Questions for Pre-Submission Consultation with NextFlex

This list of questions has been developed to help proposal teams prepare for their proposal consulation calls with NextFlex. These questions are intended to help make the calls as productive and helpful as possible toward the goal of strengthening proposal competitiveness. The questions take cues from DARPA's Heilmeier Catechism (https://www.darpa.mil/work-with-us/heilmeier-catechism) with additions and modifications relevant to NextFlex project types.

Proposal teams are recommended to answer these questions in writing and provide to NextFlex well ahead of the scheduled call. Written responses must be concise – 2 pages maximum with 10 point font; figures may be included in this page count. During the call, teams will be able to ask questions on these topics or others specific to their proposal concepts.

Proposers should email proposal@nextflex.us to arrange a consultation.

1. Provide a synopsis of the proposed project (short paragraph). What PC 11.0 topic area are you addressing?
2. What is the proposed work attempting to accomplish or do? Avoid jargon.
3. How is it done today / what is the current state of the art, who does it, and what are the limitations?
4. Describe the team composition and team member roles. Why is this the right team to solve the problem? What capability gaps does your team have an what additional capabilities do you need to add (if any)?
5. What is innovative in your approach in the context of existing capabilities? Why do you think you can be successful?
6. What are the key technical challenges in your approach and how do you plan to overcome these? What is your biggest technical risk?
7. Who or what will be affected and what will be the impact if you are successful? Please be as quantitative as possible?
8. What is your proposed budget and duration?
9. What is the pathway to manufacturing or how will this work improve hybrid electronics manufacturing? What additional work will be required after this project is completed to deliver impact on industry, how much will it cost, and how long will it take?
10. What is the one main benefit that your project will deliver to the NextFlex Community and microelectronic ecosystem? How will the Hybrid Electronics Ecosystem and the NextFlex community benefit from the project?
11. What are the key non-technical challenges to your project and the barriers to adoption of the proposed approach?
12. Are you requesting support from NextFlex during the execution of your project (material, fab access, engineering services, etc.)?

Appendix D: Proposal Evaluation Criteria

PC11.0 Full Proposal Project Review Criteria / Score Card

Criteria for all Project Call topics | **Score Guide: Low=1, High=5; refer to scoring rubric worksheet**

Reviewer Name: ADD YOUR NAME HERE

Reviewer Organization: ADD YOUR ORGANIZATION HERE

	Proposal Section	Proposal Section	Criteria	Explanation of Criteria
Technical Merit & Transition Potential	1.0	Background and Need	(1) Problem statement, innovative solution, and potential impact on technical gap and/or DoD priorities	Evaluate the problem definition in line with the background information and the gap analysis provided. Is the proposal aligned with TWG roadmaps, DoD Critical Technology Areas and/or DoD priorities?
	2.0	Technical Objectives	(2) Technical scope and approach	Is the objective, scope and approach aligned with the problem definition? Are performance and reliability metrics and standards appropriately addressed? For demonstrator projects, what are the value to the ecosystem and the advantage of an FHE solution for this problem?
			(3) Logical technical plan; key deliverables and specifications	Do the specifications and deliverables meet the proposed objectives and final deliverables? What are the key tangible deliverables & how do we assess success?
	3.0	Work Plan	(4) Project organization	Is the project organized well with milestones and tasks; Are the task descriptions clearly articulated: Is the schedule aligned well with critical interdependencies identified?
			(5) Probability of success	Based on all of the above, including the cost and the team capability, assess the feasibility to achieve the stated goals within the planned timeline.
	4.0	Commercialization Strategy	(6) Business case/value proposition	What is the targeted application or market? How is the technology/product a differentiator or a game changer? Is the appropriateness of a hybrid electronics solution explained?
			(7) Manufacturing approach	Is the technology/approach matured and ready for manufacturing? Is it the right approach? Does it help advance the MRL/TRL goals? Does the team have the right partners? Are they US-based? How mature is the process and/or manufacturing infrastructure? How does it impact US manufacturing?
			(8) Technology transition potential	Is there a clear path for technology transition / commercialization? Does it address a significant need? Are the appropriate stakeholders engaged? Is there a plan to demonstrate that the technology will be sufficiently derisked?
Non-Technical Factors			(9) MRL/TRL assessment	Are the starting MRL/TRL accurate? Are the end MRL/TRL assessed correctly, and is it realistic considering the overall quality of the project and maturity of technology and approach?
			(10) Tool accessibility **(for proposals developing tool hardware and software proposals only)**	Will the equipment/tool/software developed as part of the proposal be available to the ecosystem, and where they will be located?
	5.0	Budget Justification and Cost Share	(11) Cost and cost realism	Evaluate if the cost assessment is pragmatic based on the overall assessment of the project relative to its objective, team, advancement, timeline etc.
			(12) Value and quality of cost share	Assess based on the cost share value, cost share source and the purpose of the cost share.
	6.0	Capability to Meet Technical and Business Goals	(13) Experience of personnel, quality of relevant facilities, and building supply chains	Assess the strength of the PI team as well as the partner/subcontract organizations to achieve the proposal's goals. Does this project build or strengthen organizational relationships / supply chains?
	7.0	Education & Workforce Development	(14) Quality of EWD section	What aspects of EWD are proposed? Is intern, graduate / undergraduate student, incumbent worker training, etc. included? Are courses developed and / or implemented? Are there industry and / or student outreach opportunities?

In addition to numerical scoring, reviewers are asked to respond to the following questions:

- General Comments (Please provide succinct overall comments, especially regarding any particular section under the average score)
- Strengths (Please list the key strengths of the proposal)
- Weaknesses (Please list the key weaknesses of the proposal)
- Does this proposal meet your standard to be fundable?