WEBVTT

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and start the recording right now. Very good. webinars started and recording is starting now

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Hey, hi! Everyone Welcome to the design for environmental sustainability in computing.

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Alex, i'll pass to you to to start off I just wanted to make sure that someone really started.

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Yeah. So So, thanks to my and and thanks for being here to to get us kicked off. I I wanted to give you an opportunity to say a little bit about

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The you know the the support for this program, and how it relates to some of the high level efforts in in size.

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And so if you have a a moment to just to say a few words, i'd love to have that, and then I can sort of jump right into the slides. Thank you.

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Thank you so hi everyone i'm Demoda Silva I'm.

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The division director for Ccf computing and communications and I'm. foundations, and i'm here, speaking of course, on behalf of all my other division directors and colleagues at size, so we are all very

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excited about this program, the the concern about what we can do to advance the sustainability in our field.

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It's something that we hear from any of our pis and many of our people in our community, as we attend conferences and things like that.

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And so the program directors and here worked have been working in this this area for a while, and you probably may have seen that we had a dear colleague letter.

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You know, a description and encouragement to the community to submit in this area in the past, and we we received as a report for that to sell several angles that could be used to pursue this vision of designing for environmental

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sustainability in computing. So we based on that.

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We are excited to see that there is a space for a program that our communities thinking about it and developing new ideas.

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And now this program, we hope, will help people to collaborate towards advancing in building that vision.

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We see this as a critical program in the future of computing this polls Moore's Law world.

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We often articulate that it is critical to in general feature of computing, but also when we talk about chips and science acts that many of you have heard, and we talk about investments and critical investments in size.

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We highlight that this is our opportunity for our commits.

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Come up and and and start and develop the work that they're already doing.

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Of course, in this front. So I think the working group for making this program reality the solicitational reality.

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Now, the Pis people who be watching this webinar for considering this thinking about a ways of approaching this problem from a global perspective.

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So this is not about less consumer energy, I think Alex and the from the other.

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A program. directors in the call will make sure that they explain.

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You know what we are envisioning for this program, but just want to say that we are very excited, and I really look forward to seeing the submissions that will be coming up to this program. Alex.

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Anyone else anything else that you thought I should have said that I may have forgotten.

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This is great, Doma. Thank you so much, and thank you much.

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So much for your support. for this program and for this area, and we're excited to get started and and to talk about the first round of solicitation submission deadlines and and the whole program itself in this

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webinar. So thanks again. for that great introduction.

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And with that let me go ahead and officially jump in and kick off the webinar

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So the we can get you some information about this exciting solicitation.

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Nsf, 2, 3, 5, 3, 2 designed for environmental sustainability, computing or desk.

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My name is Alex Jones. and I am the co-director of the desk working group here at nsf on behalf of my co-director Goalie as well as program directors

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Danielev. Jim Fowler and Denella Danella Joe from the division of

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Computing and communication foundations, and C or Ccf.

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Eric Ruin, vand Linda bush now and von Layman and I'm. also from the division of computing and network systems.

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Dan costly Rebecca Hua and Sylvia Spangler from the division of India intelligence systems and Varun, Genola and Jen Lee from the office of advanced cyber infrastructure it's a lot of

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folks, but we're all excited to be here with you and to talk about this program.

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So please do, now that questions about the solicitation in the webinar, we'll have an opportunity to be posed today through the chat.

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But if they're not answered today, they can also be sent to desk, Dsc.

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At Nsf gov as well as other inquiries about the solicitation

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So just to give you a a little bit of a start of where, where this program is coming from.

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So energy efficiency has long been a topic of interest in monarch competing research and the development of information and communication technologies or ict.

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So, for example, it is, it's arguable that energy was a first order metric.

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When we started to see that power thermal barrier that became an important concern in the in the opportunity to continue scaling silicon Cmos to advance deep sub micron semiconductor technology notes of

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course, energy is a first order concern of mobile computing, and started with laptops, but expanding to smartphones iot cyber physical systems.

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Amongst the many type of mobile computers so naturally energy consumption of Ict in particular from electrical generation, using fossil fuels like whole and natural gas, that generate a significant amount of of carbon

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dioxide became recognized as a significant first order.

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Sustainability concern so energy efficiency.

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And this operation energy consumption became a somewhat narrow definition that became generally accepted in in the area of what we would think of as environmental sustainability.

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And this is, you know, natural, because it aligns with some of these other concerns.

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But recently there's been a considerable amount of interest in discussion, or, you know, in terms of the relationship of energy efficient Ict.

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To environmental, and climate goals there's studies that extrapolate as much as 20% of the world's power will come from, or the world's power demand will come from ict by 2,025 many

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studies use data centers as an exemplar of this impact.

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However, energy efficiency, has really significantly increased the the capabilities of data centers to handle large loads.

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And so we see in this chart that while Internet traffic is increased by almost 17 hex

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The the actual increase of energy consumption of data centers in the last 10 years has been in approximately 10%.

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So energy efficiency has done a lot to to help with these with these concerns.

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But there's been also advances. such as improved provisioning of machines.

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Reduction of power, usage, efficiency, pee, or the ratio of non compute energy.

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To compute energy, such as lighting and cooling.

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To have contributed to this to this trend however, the environmental impacts from computing far exceed this narrow definition. And that's part of the reason we're talking about this program, for example, recent life cycle

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assessment or assessment of the carbon emissions of a product through its lifetime of a dell server included that carbon emissions from manufacturing The system is also known as embody

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carbon. we're nearly equal to the carbon emissions from from operating the system on a 4 year lifetime.

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So the split maybe do to the relatively high utilization factor of the cloud server, because in other cases, such as tablets and mobile phones, this embodied carbon can have reach as much as 80% of

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the lifetime carbon carbon footprint of the device.

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Even highly energy, optimized, compact computing systems, I can reach even higher amounts of ratios of embody to operational carbon footprint.

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And so, while we think about energy efficiency, while we think about trying to reduce the operational energy carbon impact, we're calling Ondale's law you want to look at the highest contributor of

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system level carbon, and that in in this case may not be always the operational energy efficiency.

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In, unless these kinds of areas can come back into battles.

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Of course. Any other factors remain of import in terms of sustainable computing and current in terms of usage of rare earth elements.

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Planned obsolescence of consent, Computing systems which could be considered a corollary to Denard Scalia Morris law has has has has led to considerable amounts of E waste due to

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the continued desire to change systems over every 12 to 18 months.

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Additionally, as applications expand their computing requirements enabled by computational advantages, compute and storage, intentive app in intensive applications.

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Who's not exhausted list includes things like blockchain and homeomorphic encryption as well as ai drive.

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The need for new in innovative accelerators this often requires new classes or processors, and hardware that leave obsolete a waste in their path.

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And so we're trying to look at a more complete definition of sustainability in terms of environmental impacts in this field of sustainable computing.

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As we look at desk, so there are several under studied areas of environmentally sustainable computing things like minimizing greenhouse gas emissions, such as carbon dioxide and methane.

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Particularly over this, the full system, life, cycle, understanding and mitigating technology development forces that are contrary to environmentally sustainable computing such as 12 to 18 month, cell phone replacement cycles in part due to

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planned Ops lessons to do things like battery wearout energy.

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Efficiency alone is not sufficient to solve these challenges.

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And this is where we. We believe that the desk solicitation comes in.

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So. Nsf: 2, 3, 5, 5 design for environmentally sustainable competing or desk.

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The overarching of jacket is to build a community of interdisciplinary researchers for disruptive improvements in the sustainability of next generation.

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Computing desk mission is to address one or more

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The following key challenges in each research project that it funds for realizing environmentally sustainable.

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Computing of these key challenges, we consider applying principles of sustainable and life cycle science to computing.

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This is the concept of cradle to grave thinking about computing, including manufacturing, including disposal, reuse and and recycling as well as operational impacts that impact the environment defining

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measuring and optimizing computational sustainability. These are metrics that go beyond energy efficiency.

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And and that relate to minimizing negative environmental impacts or are trying to build on positive environmental trends.

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Pushing the parato optimal boundary. This is the question of how to align sustainability with other metrics, or how to come up with the best trade offs.

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When this alignment is not possible, her boning, designed for environmental sustainability as a talk to your goal, this is placing sustainability, metrics, and studies on the same footing with performance energy

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reliability, security, and other critical metrics for next generation, computing leveraging opportunities for sustainability across the computing continuum.

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So this refers to both across the stack as well as to different types of systems.

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That that we would like to to design in our next generation of computing goals, and finally avoiding planned obsolescence.

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Avoiding this 1218, 20, more, 24 month, disposability cycle through things like repurposing reuse and design for for longevity

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We're excited to solicit projects, to address these key challenges related to topics from all across the Slice Directory, For instance, we seek models and metrics that can best quantify environmental sustainability

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approaches to reduce environmental impacts from resource.

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Intensive techniques, techniques to promote reusability of technologies.

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Across the stack from software down to the underlying hardware and potentially many points in between new, sustainable, sustainable hardware design approaches and computing architectures.

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Sustainable algorithms, sustainable development workflows, environmentally aware and optimized systems on the continuum from cyber physical nodes to edge cloud components, new programming languages, new development frameworks, new tools, that

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address, environmental sustainability, sustainable software and interface design design of sustainable cyber infrastructure.

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And this is certainly far from an exhaustive list.

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Pis are encouraged to consider how environmental sustainability of computing can be advanced in computing fields of their own expertise and develop project proposals.

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Around these ideas. Now there are intentional boundaries to the scope of the desk.

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Solicitation, particularly rated, related to topics that are supported by size, core programs, or other existing processes.

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Incis, or across the foundation, For instance, projects that propose to advance performance and or energy efficiency alone are out of scope for desk.

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These projects are still of interest in this up, but they should be submitted to solicitations to design to advance these goals, including, but not limited to the core programs.

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Additionally, desk is designed to advance the sustainability of computing and communication technologies.

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Wow! while we're. the goal projects, that attempt to advance, using computing to advance sustainability of other sectors alone are not in scope.

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Moreover, projects must focus on environmental sustainability all the goals of improving social justice or economic impacts, or both.

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Related to computing our worthy topics they're generally not in scope for the solicitation.

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If they are not considering environmental sustainability as a principal concern.

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The desk. Solicitation is seeking a different way of thinking about sustainable computing.

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The best projects we seek will seek and transform it and impact.

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Often they may be clean slate approaches to improve environmental sustainability.

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These approaches can target a reasonable level across the computing, continue, and often make the cross-disciplinary nature.

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But they may also be very focused to a particular point. In the computing spectrum.

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However, it is critical that these projects be able to quantify and measure their improvement in environmental sustainability, and we encourage these to be projects with ambitious goals.

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For these improvements. Of course, these boundaries can be gray potential Pis are encouraged to contact the desk working group with a short for instance, one page overview of their potential project idea to get feedback on the scope and

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suitability for the desk call

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Terms of best practices hopefully by attending this webinar today.

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This will help solidify the intent. This, behind the desk program. as with all of our solicitations, we encourage you to read the written information closely, as many questions may be answered by detail scrutiny of The materials

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however, we recognize that there may be many questions not directly addressed, and we encourage you to write questions in the Q.

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And a box for the webinar, and we will attempt to answer these questions during the Q.

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And a portion of the webinar. If we are unable to get to your question, or if you have questions after the conclusion of the webinar, you are encouraged to send email to desk at Nsf Gov interested

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pis again. you may wish to send information or request feedback on project ideas related to the desk program in this fashion as well.

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The desk program, and the solicitation contains 3 types of projects: type.

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One or small projects are in some sense analogous to small projects of the size core programs.

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But of course, on the topics related to desk as previously discussed, the first round desk line for type.

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One project proposals is March seventeenth, 2023.

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This is a Friday. These projects allow budgets up to $600,000, 600 K.

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With the maximum of a 3 year duration.

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This type of project is typically designed to fund one to Tpis, each with a graduate student researcher.

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Although this is certainly not a strict limit. a pi copi, or senior person, maybe listed on no more than 2 type.

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One proposals during a particular competition type, 2 or large projects.

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The first round that deadline for type. 2 projects is also March seventeenth, 2023.

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These projects are for up to 2 million dollars over an up to 4 year duration, and are typically designed for a more interdisciplinary or cross layer research agenda requiring potentially a larger team of pis than a

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small Api copi or senior person. they participate in only one proposal during each competition.

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Additionally, there is a limit that Pis copies and senior persons may only participate in a total of 2 proposals of either type, one or 2 during each competition. Us.

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A. P. I. cop. our senior person mesa been a vaccine move to type, one proposals or a maximum, one type, one and one type, 2 proposal type, 3 or workshop projects.

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These projects are designed for community building to catalyze research activities, particularly in areas where sustainable computing has not received significant attention.

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These projects may be up to one 100 k for 100 year for excuse me for a one year, and how they, and have no limits on participation of pis copies or senior personnel.

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The limits on this program are independent of other limits.

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On other Nsf solicitations, including the size core programs.

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However, api co-pr senior person may participate in no more than 2 type, one awards, and no more than one to award.

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During the life of this program that includes all 3 listed submission deadlines.

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Thus: if A. P. I want to type 2 award in the first competition, they would not be eligible to submit bye more than one type, 2 proposal.

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Excuse me to submit a type, 2 proposal later rounds, because the limit on the large proposals is one during the life of the program. but they would be able to submit up to 2 type type one proposals similarly if a

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Pr: 1, 2 type, one awards. In the first round they would not be able to submit a type.

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One proposal in subsequent rounds, and and so on, and so forth.

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And a little bit more detail. There are 3 stated submission windows for desk.

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The upcoming deadline is March seventeenth, with sub subsequent deadlines.

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In September thirteenth, 2024, and September twelfth, and 2,025.

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Each of these are Each of these dates are Fridays small project Proposals follow the standard rules. allowing a 15 page project description, please, of course, see the new path G, and read the desk solution solicitation carefully.

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For all logistical details on a submission. As previously mentioned, these proposals are designed to be small research investigations, however they may also be used as preliminary explorations for a type.

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2 project, However, unlike some programs that include a quote, unquote planning proposal To prepare for a large award type, one projects must remain fully.

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Research projects. Thus type, one projects must be self-contained.

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Research projects. However, we're type one projects that are expecting to go on for type.

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2 funding. It is recommended that the type one proposal present the broad vision of the entire project and clearly articulate how the research in the type one project prepares for the intended research in the type 2 project We expect to

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fund up to 10 type, one awards for each solicitation, deadline life type.

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One projects the same. deadlines hold for submitting type. 2 projects type, 2 projects fall.

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Similar guidelines for other large proposals. they are Alar allowed a 20 page project description, and must include an up to 3 page management and coordination plan.

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Of course. Please see the desk solicitation, and for all details.

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In the patch. you for all details and submission requirements.

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Type. 2 large projects do not require previous type. one funding, however successful type.

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2 projects could be supported by a prior type, one small or related award, such as funding from the design for sustainability and computing.

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Dcl. that occurred last year. If a type 2 project builds on a prior award, it should explain how the new research both leverages the prior work. But as novel and not incremental to this prior exploration ideally the

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prior research could provide a foundational to new transformative foundation to new transformative research.

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Ideas, results, and agenda, concurrent and overlapping.

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These Dcl. and type, one small funding is allowed with the type.

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2 large award. However, this support is intended to be dovetailing all the type one small and type. 2 large proposals from the same pi are allowed during the same submission.

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Window. These could only be distinct proposals, so called connected type.

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One small and type. 2 large funding should not be submitted.

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Concurrently during the same funding round the intent is that some of the type, one research exploration will have been completed prior to submission of the type.

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2 project proposal to better articulate the foundational research and the novelty and difference of the type.

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2 funding up to 2 type. 2 project awards are expected for each deadline

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The standard Nsf Merit review, criteria of in intellectual merit and broader impact will be applied to all desk.

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Proposals, however, type one and type, 2 projects will be subject to additional review criteria.

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They should address relevant notions of environmental sustainability.

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For instance, projects that purely address, performance or sustainability will be noted as out of scope for desk.

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They should articulate how the vision of sustainability will be attained.

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Both theoretically and and experimentally. This is intended to allow evaluators to comment on the potential impact of the proposed work to address the challenges of environmental, sustainable computing.

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And how, and to discuss how this can be tested quantitatively.

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Finally, the proposal should define appropriate sustainability metrics such that one they reach beyond performance and energy efficiency.

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2. They can capture the impact of environmental sustainability, and 3, they can be quantified and evaluated.

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Some metrics from life cycle. Science may be appropriate, such as greenhouse gas, emission emissions, but other relevant metrics may be proposed by the pis

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Time. 3 workshop proposals may be submitted at any time up to, and including the last stated submission. Date of the desk.

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Solicitation in 2,025. However, we hope to fund more type 3 projects early in the program to provide an opportunity for the workshops, to develop and bear fruit for project teams, to submit type one and type 2 projects

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in the the duration of the desk. Solicitation workshop projects may include an up to 8 page project description, and should generally follow the format for conference proposals, as stated in the apache in chapter

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2 point F successful type. 3 workshop proposals will encourage exploration of environmentally sustainable computing in a size topic area, particularly those topic areas for which sustainable computing has yet to become a significant

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priority, or for which, connecting to sustainability beyond energy efficiency, is more subtle or difficult to envision.

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While we expect to award up to 5 workshop proposals annually.

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We hope to receive more of these early early in the solicitation again, to allow these to bear fruit for later submission.

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Deadlines.

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Similarly type. 3 workshop proposals will be asked to address additional review criteria.

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Workshop proposals should explain how the workshop will advance.

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The notions of environmental sustainability Broadly, broadly, to the topic area of interest in size.

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These workshops should focus to discuss how a vision can be developed about theoretical and experimental advancement of environmental sustainability.

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For this field. Additionally, the proposal should address, how works, how the workshop provides the potential for seating new metrics Approaches and research.

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I ideas for environmental sustainability within the discipline.

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In some cases these workshops can be critical. to help start a conversation about how to connect a particular field with the site size community, to sustainability concerns where the connection may be less apparent.

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As Doma mentioned in her opening remarks, we are extremely excited about the transformative research into a addressing the impact of Ict.

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On climate. Hopefully, you agree that this program addresses a potentially under studied research area that can.

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How transformative impact throughout the size topical areas we hope you'll consume.

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Consider submitting a proposal to the desk program Again.

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Of course, we encourage you to to consider preparing and submitting one page project summaries to desk at Nsf Dotv to get initial feedback on suitability and fit for your project idea related to the challenges in new

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enumerated by desk i'd like to stop here in terms of the scripted portion of this webinar, and open the floor to questions from our participants, which I and the members of our working group will attempt to

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answer. Of course, if we cannot immediately answer your question, or you do not get your question. answer due to lack of time in the webinar.

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Please feel free to send these follow-up questions to desk at Nsf.

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Gov: Of course. this information will also be posted after the webinar concludes, so that you can access or share this information with your colleagues.

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Thank you for your time and attention, and we look forward to discussing your questions

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So with that i'd like to invite varuna to help us read the questions and invite our program officer panel to offer answers.

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Sure, Alex, let me read out the open questions that are there.

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So there's this is an easy one it says ppt and video record will be shared.

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I guess the question is, will will these be shared? and the answers, Yes, these will be.

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Is that right? These will be posted on the Nsf website and shared so that they can be viewed later.

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Thanks, Alex. So let me read out the Another question here, which is but type 3.

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It seems to be too late to submit it before the March seventeenth deadline. while working on other type proposals.

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I was wondering if we can apply for type 3 sooner, so that we can benefit from initiating the project until we hear back from Nsf.

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For our submitted proposals on March seventeenth.

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Thanks. Thanks for reading. Yes, We would encourage you to submit type.

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3 workshop proposals. right away. we.

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We can accept these at any time. and so if if you are prepared to submit a workshop proposal these these are items which we can turn around a little faster and give you the opportunity to get working on a

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workshop, so please feel free to submit these right away.

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The The deadlines for these will be there there's no actual deadline in through the the lifetime of the program.

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So. perhaps it would be difficult for a workshop proposal to bear fruit.

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For the first March submission of type, one and time 2 projects, but certainly we hope that it would be available for at least the second round of projects.

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Thanks, Alex. let me read another one again from an anonymous attendee.

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How does this call different than the d Sc. Dear colleague, letter call?

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We submitted a one-page letter in response to that call which was given a knot of interest.

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Response. Is it worth resubmitting a one pager?

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So. let me. it's a 2 part question let me answer the first part, which is the difference between dse and desk.

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So Dfc. or the the dear colleague.

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Letter was the an open call for projects in this environmentally sustainable computing space to be submitted to the size core programs.

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Desk is different in that. It is a new solicitation unrelated to the size core programs.

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And that's why, for instance, the number of submissions that you can, that you can do for desk does not have impact the number of submissions that you could do for the size core programs.

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The second part of the question in terms of the one page project I I'm.

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Not sure that I was the one who read this particular project, but I would say that generally the desk mission is similar to the mission that was enumerated in the Dse.

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Dcl. and we would certainly be happy to receive your your one page idea again, but would encourage you to consider working through the solicitation, and some of the examples given to see if perhaps there's an opportunity to better

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tie. You were your one-page project idea to the mission of the program before sending us the one pager

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Thanks, Alex. this is from Andre. The description of the calls seems mostly related to computing as hardware our proposals that focus on sustainability of software systems also welcome or likely to be more out of school so certainly sustainability

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of software is is in scope. And we encourage submissions of this type to the program.

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The challenge is, and and continues to be, how to relate that to sustainability goals of reducing, for instance, greenhouse gas emissions.

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And so we would encourage you to consider preparing a project.

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One desk pis, so that we can give you feedback and and help to guide you in terms of what ideas you might have that are in scope, and what ones might be out of scope or more appropriate for the

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core. Thanks, Alex. This question is, is the small project Encourage to be led by 3 pi or copies.

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No, certainly that that was not the intent. The intent was to say that, like so other types of small projects,

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Certainly a single pi or twopis might find this to be an appropriate budget amount to to work on a focused research agenda within the desk space.

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And so it's certainly appropriate for a single or even 2 pis to work together.

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What I didn't want to do was exclude the opportunity. If if it seemed that 3 Pis could, or more through work together in a small project, if the budget was sufficient, and the research agenda warranted this type of

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team. Thank you, Alex. Next question. as the solicitation states, by the submission deadline. any Pi Copi or other Senior Project personnel must hold either a tenured or a tenure track position or a primary full-time paid appointment in a

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research or teaching position. So I think the question is, what counts as a researcher teaching position.

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And the reason given is that our Grants office is having a part time with this, since many of our researchers are in staff positions, such as programmer and analyst, so this is similar language to things like our core programs, can I ask our

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panel. If anyone has a a a good answer to explaining this part of the eligibility question, one answer that I've heard given in webinars like this is that Nsf describes who is eligible to submit

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proposals in the solicitation and it's really up to individual universities to interpret who on their staff fits that eligibility requirements.

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So if your sponsored research office says Yes, you are one of those people in our university, then can submit proposals to Nsf. Nsf.

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Will not quibble with that and so it's really up to your University to assigned to individual positions at that university.

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Which of them are eligible to submit to nsf It's not something that Nsf we we put out the we put out the definition, and we let individual universities decide who fits that definition and if the university

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says you're eligible we don't quibble

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And I think, Eric mentioned university, but this could also include other organizations as list yes, I I i'm i'm guilty by by being at a university of sort of thinking of universities.

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First. But if you look at this, if you look at the solicitation, it describes which institutions and which and how people are eligible, and how the individual institutions define that is up to those institutions, and if they say you're

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good. We don't argue thanks. eric let me go to the next question for model development is there an interest for a particular application example.

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Can we develop and obsolescence model that can be applied in the wind, energy, or hyperformance domain?

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Or it should be for data centers so trying to unpack this a little bit. I think we need to be sure that the the goal here is not to, for instance, redevelop integration into mark grids, but rather that we're looking

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at trying to understand and improve the sustainability of computing and communication technologies.

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So, does it have to be for data center? Certainly not.

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But it does have to relate to computing and computing and communication technologies and the the environmental impact from those technologies being improved in in some fashion.

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So if if wind energy is part of how you are integrating with cyber physical systems, Internet of things mobile computing.

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And and this is a a part of how you develop the systems that work on these work.

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From this type of energy. Perhaps that is, that is a a project in scope for desk.

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I would encourage you to to write up a one pager and submit it. for us to to provide you with direct feedback.

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Thanks, Alex. So this question is from daniel do projects need to have actual implementations or simulations are okay for evaluation.

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That's a that's a good question I think in terms of answering this question.

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We often see projects now that that use simulations and models on to solve various computing problems.

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And one of the things that this desk program solicits is improved.

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Models and metrics for understanding environmental sustainability of computing.

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So certainly simulations are reasonable. the better that simulations can be validated.

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Is is useful, and there's always I I would say a certain level of excitement, of seeing an actual implementation of a particular idea that might go along with other simulations.

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I think it's up to you or other pis to decide what?

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Where is the appropriate investment for your project? Agenda, your research agenda?

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And and how your evaluation matches that agenda in terms of the focus in in related to the budget that you are are requesting for Msf.

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Is there anybody else on the panel want to chime in on that

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No, I I agree with what you, said Alex. that makes sense Okay, let's move to the next question.

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Thank you. this is would you recommend the Pi meeting?

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The project comes from a computer science or engineering program, or someone from mechanical engineering with research focus on sustainability can lead it.

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I have a feeling that the program is more towards computer engineering than mechanical or aerospace engineering.

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So certainly. there's no requirement that the pi come from a particular type of program.

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I think, topically. it. it's important to on to understand the goal of the program is to address sustainability of community computing communications, technology.

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So if if there's somebody in a mechanical or aerospace engineering department that has a particular project idea and and appropriate background to provide solutions for for a research agenda in that space that is perfectly fine

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for them to lead a desk project. However, if the project is going to be more heavily focused on, for instance, mechatronics or space computing they would need to make sure that the agenda is appropriate and compatible

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with desk program

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Alright. So I think that that we are at the end of the open question.

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So maybe if anyone has any outstanding questions, this would be the time to type them in, or people who ask questions earlier.

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If if there's some part that we did not answer please let us know

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So we can take 1, one or 2 more minutes to see if there are any additional questions.

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Otherwise i'll just quickly mention. as Well, please do take take a few minutes to read the solicitation in detail.

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I know. the solicitations can seem quite long, and in some cases may feel repetitive.

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But there there are often a lot of Gotchas and little details that can be

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It inadvertently overlooked in a submission and we certainly don't want to have projects submitted with missing information that that can't be considered as part of the competition.

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So, for instance, particularly if you're submitting a workshop or a large project to note that the project description has a a non standard page duration or page limit large projects can reach up to 20 pages, and

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workshop projects. have a limit on of 8 pages, and of course the the large projects also have that management and collaboration plan requirement that must be included.

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Of course, pay close attention also to those criteria for for evaluation.

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This can help to ensure that you're research Agenda is best aligned with the desk solicitation.

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And of course this is what reviewers will be asked to consider in in addition to intellectual merit and broader impact of the projects as they're submitted.

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So we would also like to encourage Pis to to to be very to think broadly and about how sustainability can apply to their project to their project area of expertise.

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And we were already had a question about software projects we definitely want to encourage projects from all over the size spectrum to participate in this program, and it may take some effort to understand the connections to to sustainability if

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that's the case that's something that should be very very clear in the project.

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Description of the proposal I think we do have another question.

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Yeah, I think there's one says software optimizations that lead to higher energy efficiency thereby leading to lower greenhouse gases.

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Are these in line with this program. So again, we we mentioned a few times that energy efficiency alone is potentially not a sufficient metric for for desk.

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We agree that energy efficiency can and has in the past led to lower greenhouse gas emissions, as we saw in the last 10 year, trying for data centers, however, with renewable energy integration and data centers that

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this is likely to become a and asymptotic impact.

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In other words, we're not necessarily expecting to see the same energy efficiency benefits, as we integrate more low carbon.

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Renewable energy sources into data centers and other and empowering other computing technologies.

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And so the question then becomes, How does one minimize carbon?

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For instance, if carbon comes from more or fewer systems, how do you think about provisioning?

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How do you think about using the systems that exist with?

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Soft, different software optimizations to to better use pot potentially fewer systems or simpler systems.

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And achieve similar goals. that this is another way that one might consider how you can reduce carbon emissions or other types of emissions, or how slower impacts the longevity of systems alright So

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so heavy loads could potentially make systems fail more quickly.

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Which could have an impact in terms of environmental sustainability.

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I think you know, in in terms of the software. space. these connections are are are more challenging and more subtle, and often have some connection to their underlying hardware.

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So perhaps there's an opportunity for one or more workshops in that, and related areas to discuss and look at opportunities in in this sort of desk space to see what kinds of projects might emerge that are that are exciting

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and and in line with the the goals of the program.

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I I I can expand on that also just a little bit, because you know one of the questions that we can't ever answer.

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No matter how many times people ask the question, is if I propose this, will it be funded that's just not a question that we that we can answer a priori?

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You can submit things there'll be panel reviewed by our panel, and we can make recommendations best based on what our panel tells us.

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But we can't say yes. if you submit this this is this will be funded, and the other interesting thing about that question is that one of the goals for this desk?

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Solicitation was to try and encourage proposals that wouldn't farewell in a normal competition for the size core programs.

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And so if you have, for example, software optimizations leading to higher energy efficiency that might actually play well in the regular size core program.

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And so what we're hoping for with the desk solicitation, I think, is proposed proposals that go a little further into the larger issue of sustainability than would be a natural fit for the regular size, core program

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So this is something you might consider submitting to the regular size core program.

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Then it might better be a better fit for that program if it's something where you have a sustainability angle that you think might not play well in the regular size core program that might be a perfect fit for the desk program

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and it's hard to say what that means thanks eric and and to expand on that we we're trying not to answer questions with this will.

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Farewell, or this walt farewell But rather this is within the scope of the types of projects in the program versus ones that are generally not in scope for the program.

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So there's one more question here. it's what do you mean with first order metrics.

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So, going back to the early days, what we cared about performance performance performance right?

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So the first order metric was always, How fast can we?

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We do the computer. Later performance was joined by things like how much energy in power

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And I sort of talked about this at the beginning. That part of that was due to how scaling was working and and that there were thermal concerns from scaling, and later on, other metrics became important things like how secure is your

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system. And And how big of a problem can you solve?

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And the scalability the these can be first order metrics for computing what we're trying to avoid.

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By saying, we want sustainability. to be a first order.

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Metric is to say, Oh, yeah, we'll make the program faster

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And by doing so It'll be more energy efficient so it'll be sustainable that makes that makes sustainability.

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Not a first order metric, but a side effect and that's not what we're looking for here

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Alright, thank you, Alex. So I don't see any more question oh, well, this just one triggered in.

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Let me read it. So Isx. exploring successful sustainability practices in other domains for computing and communication technologies within the scope of this opportunity.

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So we specifically are excluding, using computing and communication technologies for other sustainability in other domains.

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For instance, to make buildings. you know more better for lead, certification, or for sustainable agriculture.

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These are very worthy goals, but they're not what we're trying to target here.

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We're what we're trying to target here is to make the actual computing and communication technologies more sustainable.

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Now it's certainly reasonable just say I want to use these technologies in a sustainable domain, such as acts, and in doing so I want to show how I can make them the ict itself more sustainable while

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solving this problem to me. but the focus needs to be on that sustainability of the Ict.

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Not just on making the agriculture more sustainable, or the building more sustainable, or or other types of or electricity generation more sustainable.

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Those kinds of things. Thanks, Alex. I think we are at the end.

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I do not see any other open questions so with that as we're reaching the the top of the hour.

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I'd like to thank you again for attending the webinar. I'd like to thank dilma for getting us started, and for our all of our panelists for the both their hard work in in getting the

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solicitation through the process, and available to the community, but also for participating in the webinar and helping to answer questions.

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We will be available to receive your questions. at desk at Nsf. Gov.