

Graduate Council 2021-2022

March 3, 2022

Members present: Iraklis Anagnostopoulos, Amaka Anaza, George Boulukos, Lisa Brooten, Randy Burnside, Phillip Chu, Buffy Ellsworth, Craig Gingrich-Philbrook, Usha Lakshmanan, Junghwa Lee, Liliana Lefticariu, Ruopu Li, Adrienne Long, Matt McCarroll, Trish McCubbin, Caleb McKinley, Rachel Nozicka, Kyle Plunkett, Bethany Rader, Sophia Ran, Thomas Shaw

Executive-Officio: Lizette Chevalier, Gary Kinsel, Stephen Shih

Guests: Heidi Bacon, Julie Lindsey, Scott Hamilton

Meeting started at 8:02 AM

Shaw: Consideration of the minutes?

Shaw: Hearing none, do I have a motion to accept the meeting minutes?

McKinley: Moved

McCubbin: Seconded

Minutes approved (16-0-1)

Report from Council Chair

Shaw: I received emails yesterday or the day before mentioning that the chancellor as well as the provost are unable to attend today's meeting due to participation in the St. Louis event. With that, associate provost, Dr. Lizette R. Chevalier, mentioned she is going to come in and give a report. Look forward to her report.

Remarks from Associate Provost

Chevalier: Thanks for letting me do this. I just have a few comments that the Provost asked me to present to everybody.

Mask Update - A reminder that between February 28th-March 28th masks will continue to be used inside the classrooms and in lab settings. The memo that was sent out from the Chancellor also mentioned healthcare services, the bus and other places like that.

Unit Effectiveness Plans- Another thing we are initiating now that the strategic plan has been released and we have the five pillars, is a campus wide effort to do what's called "unit

effectiveness plans". What these plans will be doing will allow us to set up strategies that have actual action items, some benchmarks and a chance to reflect and assess whether or not we are achieving our strategic pillars. This has gone out to all the provost direct reports and I'm sure the other vice chancellors. I think Gary could probably speak about how this has gone out to his unit.

Enrollment Management - Enrollment management is continuing to have weekly meetings where they are focused on the yielding of admitted students. We have a couple of positive trends that are worth noting. For our first-time and full-time freshmen, we have an increase of applications compared to this time last year which is 25 weeks before classes. Our applications are up 15.2%. When we get down to what's been admitted within that, we have an increase of 31% on the admits. Again, looking at yields, how do we get these students to actually register and come to SIU? The other place where we see a positive trend is transfers for our off-campus programs. Here, our applications are up 16% and our admits are up 8.5%. Where we still have some challenges is with our transfer students on campus. The applications are down 6.4%, but when we get admitted we also see were down compared to this time last year 14.7%. We also have some challenges with graduate students. Our applications are up 23%, but admissions are down 24%. Those are the four comments I was asked to represent to everybody on behalf of the Provost. Any questions I can help with?

Questions for the Associate Provost

McCubbin: Lizette, Stephen or others, what's the explanation for that disconnect particularly on graduate students where were down 24% in admits?

Chevalier: My understanding is that it has to do with the fact that the admissions are done within the academic units as opposed to the undergraduates are done through admissions, so enrollment management. The review by faculty has a different timeline. Let me step back and let other folks address that too.

Shih: Yeah, I concur with Lizette. The ball is in the academic units court. We admit students, but we are still waiting for the academic units to make timely decisions. That is very important.

McCubbin: If the Provost was here, I think she would remind all of us that we have to keep moving in a timely manner because we have graduate students that have other offers. We, as faculty members, slow the process down a little too much sometimes.

Remarks from the Vice-Chancellor for Research

Kinsel: Good morning everybody. I have just a few things to update you on including information and deadlines.

- **Advanced Energy Institute Proposal** - Myself, Lin Lin burg and Kent Anderson from the Advanced Energy Institute have been working forever on a very large proposal that's going into the build back better regional challenge for the state of Illinois. If you recall, I stated in the fall we participated in a phase 1 application. There were over 500 different

organizations that submitted to that original phase 1 proposal. The information was that the Economic Development Agency (EDA) would be picking roughly 50 or 60 of those who would then go on to compete for phase 2 for \$100 million. We teamed up with a bunch of other institutes throughout the state of Illinois and it was led by a group called "mHub" up in Chicago. We submitted the phase 1 application and we were very fortunate to get selected to go onto phase 2 out of approximately 500 applications. We were one of 60 different units or groups that were selected to go to phase 2. We are now in the competition for phase 2 funding. We've been working for about a month and a half to get this phase 2 proposal together. Right now, it's quite a political thing. If you can imagine, if they're going to fund 25 or so of these phase 2 proposals, there's a lot of states that want to make sure some of that federal money is coming to them. Therefore, we've been doing a lot of outreach to regional politicians, state politicians and state leaders in business to make sure we have lots of support behind this. We've also reached out to our federal legislators. The goal is for us to get awarded the phase 2 award at some level. If we're successful, it looks like the southern Illinois region would get about \$9 million of that. This money would go towards the electrical engineering program for their grid system they have on the roof of the engineering building as well as to the automobile technology program. All of this is oriented towards modernization of the energy economy in southern Illinois, specifically having to do with moving in the direction of using electric vehicles in a rural area. You can imagine seeing electric vehicle charging stations being installed as well as the workforce being trained in knowing how to handle those vehicles. That is a quick snapshot of what's going on in that area. I want everyone to cross their fingers. If anybody mentions it to you, make sure you speak positively of the impact this will have on southern Illinois. This has a sizable impact not only on the university, but also the region as a whole. I want to make sure everyone is aware of this.

- **Illinois Innovation Network Grant Opportunity** - Next, the Illinois Innovation Network is putting out another seed for a grant funding opportunity that was sent out through the research matters list. The deadline for those proposals is May 9th. The proposal requires that you have a partner at another hub institution such as the SIU Edwardsville, Illinois State or Northern. Most of the universities in the state of Illinois have one of the Illinois Innovation network hubs. If you have a colleague at another university in the state of Illinois, you can get together and talk about whether or not you can write a grant for this type of seed funding. The general theme of this seed funding is sustained ability. That's a pretty broad category and they treat it as a broad category. This category doesn't just mean somebody developed a new battery, it can mean all kinds of issues relating to sustained ability such as pollution, reduction in greenhouse gasses or even simple literacy in the population at large. If you have some ideas and you have a colleague, consider submitting an application to that funding opportunity. Our research and creative activity forum is scheduled for April 14th. We already have the registration sign up for any students who would like to present posters. The students need to go in and submit the registration indicating they are going to submit a poster in order for us to get an accurate count and organize this better. Please tell your undergraduate or graduate

students that if they would like to present a poster at the creative activity and research forum to go ahead and register.

- **Judges Needed for the Research and Creative Activities Forum** - Related to that, we need faculty to be judges. If you have a couple of hours of time on your hands, we would love to have you consider volunteering for the forum. We also need judges for the REACH applications. The winners of those applications will be announced after the forum. We will be announcing REACH award winners, winners of the foundation grants, Sigma Chi will be announcing some special winners from their organization and other things will be going on. I would like to stress that it's not just STEM applications that we receive, we get applications across the spectrum. If you have a few hours to spare and would like to be a judge, please reach out to Jackie Linderburg in my office and let her know. We would love to have you on board for that process.
- **Submit Grant Proposals to Sponsored Projects and Administration Office in a Timely Manner** - For those of you who submit proposals through the office of sponsored projects and administration, one of our research projects specialists who do the pre-awards is going out on medical leave. For the next month or so, we will only have 2 folks on the pre-awards team; therefore, we need you to be timely on your submission. When there are only 2 people working in that office, it becomes much harder to process grants that are submitted on a day before notice. If you can, please be considerate of those who are trying to keep up with the large load of grants that come through that office and give them as much notice as you possibly can. We are in the process of hiring some replacement staff. In a few months, we will have some hands to help out. For the moment, we need you to be considerate of their time. Please pass this on to your colleagues so that they don't walk in the day before a grant is due. There is a good possibility they will be told no and we simply can't turn that in before the deadline.
- **Quarter 2 Results of Grant and Contract Funding** - In quarter 2, we had 91 proposals submitted compared to 86 last year. This year we have had a total of 182 proposals submitted compared to 159 compared to last year. So far in quarter 2, we have received \$20.6 million of awards compared to \$16.7 million of awards in quarter 2 last year. We've received a total of \$52.6 million compared to \$38.7 million the last year at this time. That's about a 36% increase in research funding. As a result, we are on a positive trajectory. There's a realistic possibility we will exceed \$70 million of research funding. We might even approach \$80 million of research funding this year. That is the combination between the Carbondale campus and the School of Medicine campus, which is how we typically count these numbers. There are many reasons to celebrate here. I will be excited to report if we receive over \$70 million of research funding. Congratulations to everyone who has received awards and thank you to all of you who have made efforts to make that happen.
- **Second Annual Southern Illinois Hemp/Cannabis Symposium** - Taking place 8 a.m. to 1 p.m. March 26 in the Southern Illinois University Carbondale Student Center auditorium and international lounge. Attendees may join in person or virtually. Hemp cannabis is an interesting field because it goes all the way from agriculture, how to grow the plants, how to test them, the medicinal properties and how they are used in the

market. There are also legal issues that are always evolving. If you have any interest, I would encourage you to register.

Questions for the Vice-Chancellor for Research

Lakshmanan: When would be a reasonable timeline to submit proposals for grants? If the deadline is on a certain date, how much time is needed for these two people to process the grant? Also, since there are a lot of grants submitted around this time, would it be possible to hire a temporary person?

Kinsel: Sure. There is a written policy in the sponsored projects and administration office asking that you submit proposals 10 days prior to the deadline. A lot of people misinterpret what that means. Some people think that means they have to have the proposal done 10 days in advance of the deadline. That is not correct. You need to get your budget submitted 10 days prior to the deadline. To submit a proposal, you need to be submitting a preliminary budget so that it can be reviewed and any problems can be reconciled. When you submit the proposal itself, the pre awards team will make sure you have checked all the boxes. In terms of hiring additional support staff, we will have one new person on March 15th and they will have to be trained. We will have another person hired at the end of March and they will have to be trained as well. We are working the best that we can with the staff shortage. Although hiring a temporary person is a good idea, there is a lot of training that needs to happen to ensure they are contributing in a way that we would like.

Remarks from the Associate Dean and Director of the Graduate School:

Shih: Good morning, everyone.

3MT (3-minute thesis) Competition - The Grad School hosted the 2022 SIUC 3MT Competition last Friday. We had 7 contestants nominated by various colleges and schools. We have come out with 3 winners: Sandipty Kayastha (Plant Biology) placed first in the competition, followed by second-place winner Ashani M. Thilakarathne (Forestry) and third-place winner Madan Ghimire (Pharmacology). My sincere congratulations to them all on their outstanding presentation and well-deserved award! The 1st place winner will be representing SIUC to compete in the 78th Midwestern Association of Graduate Schools (MAGS) 3MT Competition (to be held during the 2022 Annual Meeting, scheduled for April 6-8, 2022, in Milwaukee, Wisconsin). My special thanks go to Dr. Tom Shaw, Dr. Lizette Chevalier, Dr. Junghwa Lee, Dr. Ed O'Donnell, Dr. Craig Gingrich-Phibrook, and Dr. Lingguo Bu for serving as the judges of the competition. Thank you for your support! I cannot thank you all enough!

Assistantships and Fellowships - The grad school also hosted a workshop for the grad study staff and the directors of grad studies about two weeks ago. We provided overviews of procedures from all aspects of the Grad School from Admissions registration, assistantships etc. We had a great turn out. If I remember correctly, we had over 50 attendees. The last month has been a busy month for our assistantship office because we were in the process of nominating and selecting fellowship recipients. We have come up with the results. This year we offered 5

Graduate Fellowships, 11 Doctoral Fellowships, 10 Master's Fellowships, 2 PROMPT Assistantships and 2 Morris Fellowships.

Grad Council Elections - The last comment on my list is about the grad council elections. It's about time for the grad council rep election. We are now at the preparation stage where we gather data about faculty at different colleges and schools. Last year was the first time we used the Microsoft Teams to create a poll and survey. I think it worked well, so we are going to be using the same procedure this year. I plan to send out the nomination memos to the colleges and schools around mid March. I expect to complete these tasks in early April. Stay tuned. This is what I have for today, so I'm happy to take any questions.

Questions for the Associate Dean and Director of the Graduate School:

Shaw: I have a question about the 3MT presentations. What did the winners present over?

Shih: I need to look into my files. I believe the first place winner presented over bacteria. I'm going to make a special presentation with the winners' names and their PowerPoint slides to highlight the first three winners.

Report from Council Chair: – Indirect Cost Recovery Task Force-update

Shaw: If you recall, the director of Salukicare was going to speak about the resources available to the students in January. I emailed them to see if they could speak today and I did not get a response, so we're not going to have this particular section. As you know, we've been working on the indirect cost recovery task force. We're progressing and past the foundational stage and reviewing where the money has been distributed throughout the university. We're trying to decide where our priorities are as far as using this money with the new strategic plan and with the 5 pillars of research and innovation. Our goal is that we have a product by the end of April. Gary, do you want to add to this?

Kinsel: I concur. I think the committee is making good progress. I want to say thank you to various elements on campus. It's been useful to receive information about how our indirect is currently being spent. Everyone is thoughtfully considering those expenditures. I also think it's important to point out that the committee and I agree that we ought to review how the overhead dollars are being expended to ensure they're being expended in a way that everyone feels comfortable with. I've suggested that we have an annual review of how overhead dollars are expended. I think the goal is to have a report and recommendation certainly before the end of the semester and maybe at the end of April.

McCubbin: In December, we discussed there was a concern that a committee was extremely unbalanced in gender. Was that this committee and was that addressed?

Kinsel: Yes and yes.

Report from GPSC

McKinley: Morning. Quick update form GPSC.

Award Opportunities for Research, Teaching and Service - We are going to be giving out awards for research, teaching and service. If you know of some graduate students who are doing some wonderful research and you would like to nominate them, the application to do so will be on our website very soon. Teachers, if you have graduate teaching assistants they can also be nominated. The application requires a couple letters of recommendation, (at least one from a current or former student), a teaching philosophy, an ICE and any qualitative data from teaching. Awards will be happening near the end of April.

Questions for the GPSC:

Lakshmanan: Would it be possible to send a link to the website? I would like to send the link to my colleagues as well.

McKinley: Absolutely, I will be happy to send this link to the grad council so you can nominate your students.

Lakshmanan: I wanted to find out more about the awards. One award is for research and one is for teaching? What is the amount of the award?

McKinley: Yes. That depends on the budget. Last year, the top recipient received \$1,000 and the second recipient received \$500. The teaching award recipients received \$300 a piece. However, the reason we were able to give out so much money last year is because we had a lot of carry over from the previous year due to COVID.

Chevalier: I wanted to mention that we are reopening applications for the NTT teaching excellence award as well as the scholar excellence award up until March 15th. We did not have any applicants for the NTT. There has been a nominee for the 10-year track, so we are not reopening that application.

Ellsworth: I had one question about the awards for the graduate students. When are those due?

McKinley: I believe the end of April. Because our website is down, the due date is not set in stone.

Report from Council Vice-Chair

Junghwa Lee: Nothing to report.

Report from Faculty Senate

Rader: Good morning, everyone. We have had 2 faculty senate meetings since the last grad council meeting, so bear with me for the long list of accomplishments and updates. In our December meeting, we approved four full professors for appointment to the judicial review

board through the elections committee. We approved the Resolution to Support Professor Mingqing Xiao through the Faculty Senate's Faculty Status and Welfare Committee. Through the undergraduate education policy committee approved a resolution to Rename the Touch of Nature Environmental Center to the Touch of Nature Outdoor Education Center and approved the Resolution to Recommend Approval of the RME to Rename the Advanced Coal and Energy Research Center (ACERC) to the Advanced Energy Institute (AEI).

At the February meeting, the FS members approved several resolutions. Our Governance Committee had a "Resolution to Appoint a Parliamentarian" which was approved by the FS members. Our Undergraduate Education Policy Committee presented seven RME's and resolutions which were approved by the FS members: an RME to make changes to the BFA in Art; an RME to create minor in Communication Design within Art; an RME to create minor in Studio Art within Art; an RME to rename specialization within the BS in Management from Personnel Management to Human Resources Management; an RME to eliminate the BS degree in French-Education (TEP); an RME to eliminate minor in Museum Studies; and an RME to change specializations in Automotive Technology and add a minor. Let me know if you have any questions.

Chevalier: Just a clarification on what Bethany said, we're not eliminating those art specializations. We're merging them into a studio specialization that's more interdisciplinary. All of the elements will still be a part of the curriculum.

Rader: Thanks for the clarification!

Report from New Programs Committee

Ran: Hello, everyone. We have received 3 RME's. I'm going to talk about the RME that we have a resolution for. The other two RME's will be presented at the next meeting because we still have some questions that we would like to clarify.

This is a Resolution to Recommend Approval of Elimination of the MS in Mathematics and Science Education in the School of Education. Whereas, the Master program in Mathematics and Science Education in the School of Education that was established in 2008 had not student enrollment from 2012; and Whereas, the lead faculty member for the program is no longer with the university; and Whereas, education for mathematics and science is currently provided by the existing program of Curriculum and Instruction Secondary Education; and Whereas, no budgetary consequences of elimination of the program are anticipated; and Whereas, formal elimination of the program will help clearance of inventory; Whereas, review of this RME by the faculty of the School of Education received strong support by a vote of 19-3-2; Whereas, there is unanimous support from the New Research Programs Committee of the Graduate Council by the vote of 6-0-0; Therefore, be it resolved that the Graduate Council Committee recommends approval of the RME to eliminate the MS program in Mathematics and Science Education in the School of Education.

Questions for New Programs Committee

Shaw: Any discussion? Do we have a recommendation to accept?

Lakshmanan: I see that the faculty in the school have voted yes. Who was this program catering to? Was it catering to potential students in Southern Illinois who needed this? What will these students do who want to get such a degree?

Ran: The rationale for the resolution is exactly that. There has not been any admissions for this program since 2012. Part of this program is provided by the existing program in curriculum in the school of education. There is no point in keeping this program when there is no enrollment.

Lakshmanan: Why has there been no admissions since 2012? Is it due to a lack of interest or due to a policy or a decision that was made?

Chevalier: I can provide some insight on this. My understanding is that it was a program that went forward based on a grant. Then, the grant ran its course and it was a cohort model. They shut down any admissions to it because there were other opportunities and other venues within the school of education and the college of education and human sciences. This is cleaning up some of our inventory that is no longer offered. If we don't clean up this inventory, it gives a false sense of degrees that we are offering and could impede us from moving forward with new degrees.

Ran: In my personal opinion, if we do not clear up our inventory this can be confusing for applicants, existing students and faculty and can reduce our credibility with the degrees that we offer.

Shaw: Any other questions?

Shaw: Do I have a motion to accept the resolution?

McCubbin: Moved

Shaw: Second?

Chu: Seconded

Shaw: Any further discussion?

Shaw: Hearing none, all of those in favor to accept the approval for the Approval of Elimination of the MS in Mathematics and Science Education in the School of Education.

Resolution to Approve Elimination of the MS in Mathematics and Science Education in the School of Education (18-0-1)

Report from Research Committee:

Chu: Nothing to report.

Report from Program Review Committee:

Shaw: O'Donnell had to attend another meeting, but he mentioned in the chat he had nothing to report.

Report from Educational Policies Committee:

Philbrook: Hi everybody. When last we met as a whole body, Usha raised a concern about what we might think about as the inequitable burden and inequality in fellowship application requirements in relationship to citizenship and the kind of transcripts required for them. We forwarded that to my committee. I also went through a Covid experience, so I was not available to be with them as much as I would've liked to. I've put in the chat a document that outlines what those requirements are. I wanted to make sure we understood what those requirements were. Part of the concern was the question about official transcripts. Regarding the nature of the transcripts, the transcript language says final transcripts. It doesn't say official transcripts and so I think we need to clarify either with the people who are interpreting that or the language in relation to what the real intention is there. Perhaps the larger issue is the question about citizenship. Citizenship is certainly a loaded term and it's been mobilized in a variety of political ways. I have a good friend that does a lot of rhetorical analysis of how the word "citizenship" and how the word "citizenship" is deployed rhetorically. As I look through the descriptions in the different fellowships, some of them require citizenship and some of them do not. The language is not uniform across fellowships. I'm not sure if there are real differences in the requirements. This is an issue our committee will be looking at. I present it to you all today to bring it to your attention and respond to the concern. I also invite you to do two things. I put my email at the bottom of this document. I am interested in knowing how we assess the intent of these requirements as well as if you and your graduate directors in your programs have what we might think of as case studies in the under burden that is imposed on international applicants. I'd be interested in gathering some of those case studies to help the committee make sense of how we go forward. I'm happy to answer questions. This is a request of information and sharing of what I found in the description of the different fellowships.

Questions for Educational Policies Committee:

Lakshmanan: Actually, this came up in the School of Psychological and Behavioral Sciences. There are two people who are being considered. One person was being considered for the Dean's Fellowship a couple of days before the deadline. We found out that he was not eligible for the Dean's Fellowship. I think the Dean's Fellowship is for people who have experienced or undergone trying circumstances. The GPA required is lower, but then to our surprise we found that person was not eligible because he was not a citizen or a permanent resident. However, this student was eligible for the Master's Fellowship. Another student was being considered for the Doctoral Fellowship, but was missing a transcript from 10 years ago and her application was rejected. Both of these students would have met the requirements, so this is troubling.

Philbrook: If you look under the Graduate Dean's Fellowship, it says "ALL degree granting institutions" and I think that is potentially confusing. I think this is a point of clarification that we need to address as well. It may be helpful to get a sense of how this requirement has been interpreted and how it has affected people.

Kinsel: I just had a question. What is the source of the money? If the source of the money is coming out of the foundation, in many cases how you utilize the money is defined by how whoever initially set it up. To be honest, some of the awards have such strict requirements, that we find ourselves in a position where we're rarely able to give them out. Unfortunately, on occasion, the individual who set up the endowment has since passed away and it becomes difficult to get the requirements to change.

Philbrook: That is wise. We will try to find that out. We can work with Stephen to see if we can try to identify where to begin in establishing this trail and getting this information. I still invite you to write me a reflection on how the requirements have been interpreted and utilized as well as the consequences they've had.

Shih: I'm going to look into various fellowships with regard to their intent. I echo most of Usha's concerns and suggestions. I think we need to hold a meeting sometime together and do some initial investigation. If necessary, I'm going to invite Kevin Clark from the foundation.

Philbrook: Thank you. Thank you all.

McCubbin: I want to say this was helpful.

Shaw: Thank you Craig for your information and working on this concern.

Research Spotlight:

Shaw: Let me go ahead and introduce you all to Scott Hamilton at Brehm. Scott received his B.S. in 97' from California State where he studied bacteria inside the abdomen of prehistoric bees trapped in Amber. He worked for the Promega biotech company for four years before returning to academia. He received his PhD in biochemistry and molecular biology in 08' from the University of Georgia. In Athens Georgia, he worked on the hyperthermophile pyrococcus furiosus otherwise known as the "trashing fireball". He expanded his expertise with extreme microorganisms in his post-doctoral research position at Oak Ridge National Laboratory from 08' to 12' and then the Desert Research Institute in Las Vegas, Nevada from 12' to 16'. Now, we are fortunate enough to have him in our microbiology department at SIU, where he is continuing his research in culturing and characterizing subsurface microorganisms. With that introduction, I welcome Dr. Scott Hamilton-Brehm.

Hamilton: Hi, thank you. Thank you for inviting me and I'm happy to share our recent win here. I'm still trying to reel in out how this all happened and the fact that we're successful. We have a small team that consists of me, Tia and Jennifer. We entered a student XPRIZE proposal for carbon removal and we won. To give you a background of what this is, the XPRIZE funds all sorts of different challenges from new protein to new communications. The Elon Musk

Foundation put in \$100 million to answer the question of “Can we upscale in turning carbon frustration to a real industry so that we can make a difference?”. They have different phases. The first phase is a student team. As long as there are 50% or greater of students in the team, you can also have a professor. I am the mentor here. There were 23 teams selected in the first phase and we were one of them. This is an international competition. The initial win is \$125,000. Then, we have to put in a progress report in June and we will receive another \$125,000. The XPRIZE has a laundry list of criteria we need to meet, so it wasn't easy and not like a traditional proposal. We know that currently there are rising levels of CO₂ in our atmosphere. We have different analyses out there from monitoring the air quality to ice cores. As far as human history is concerned, we have never seen these levels of CO₂ being produced and put into our atmosphere due to the last 250 years of industrialization and burning fossil fuels. This is not to say this hasn't happened in earth's history, it's just we humans have never been around to witness this. It's like a simple chemistry experiment, if you start adding a chemical or a gas into the environment, there are going to be some changes such as different enthalpies, exchanges of energy, weather patterns and so forth. Therefore, we are entering uncharted territory.

We've seen such effects such as melting glaciers and erratic weather. The XPRIZE basic knowledge is that there is no way we're going to eliminate burning fossil fuels. We need it to support human infrastructure, but we should look at ways of limiting it and reducing the output. We need to take care of the backlog of the last 250 years of accumulating CO₂. This was the XPRIZE challenge: can we come up with a method that will go after the existing amount of CO₂ in the atmosphere? There are methods being explored, we call them Carbon Capture and Sequestration (CCS). Basically, it's capturing flue gas or trying to pull it right out of the air and pump it back into the ground. There's a lot of reasons why this is problematic. For one, this is not efficient. All of the pilot studies have been funded by DOE and other countries. There is no way to make this feasible on a large scale to make it profitable. For the XPRIZE challenge we wanted to break this and create a better system. The earth breathes carbon every year in all seasons. The earth fluctuates because plants grow fixed CO₂ and then drop their leaves and so forth. If you were to measure this, every year we fluctuate between 12-16 Gt of carbon. That's a lot of material. We're constantly going up every year and that is us humans putting more carbon into the atmosphere. The question is: can we intercept this? Can we take a cut out of this fluctuation and put it back underground? There is one organism on this planet that does it really well, plants. Plants fix CO₂ and it's a part of their metabolism. This kind of comes back into my history and my past. We were working using the cellulose and carbon in plants to make bioethanol. However, we could never break it down. There is no feasible way to do this. 10 years later, I met Dr. Anderson and found out he discovered a method that requires pressure, heat and water and a little oxidant to liquefy any biomass into a water soluble solution liquid that has carbon in it up to 90% conversion, which is phenomenal.

With collaboration, we put together a student proposal using a process called Oxidative Hydrothermal Dissolution (OHD). We were going to liquefy some waste biomass that no one cares about and feed this material to the microbes to see if they will convert it and eat it. Anything that has waste biomass, sewage or anything with carbon in it can be put through this process at a 90% conversion. This is the key part to making this process financially viable. For pulmonary studies, this is a bioreactor that we pump the liquid into and fused it with microbes

from The subsurfaces of Nevada. These are some of the samples I've collected from the research Institute and brought here to SIU. The microbes did not die, they actually re-organized themselves and adjusted themselves at different levels in response to this liquefied carbon. These were encouraging results, meaning that, if we pump this liquid into the ground, it's not coming back up and it's amended to the life forms down there. This can potentially turn back into fuel for future generations. Ultimately, it is a direct correlation of removing CO₂ from the atmosphere and converting it to a liquid form that is transported and linking it deep into the ground where it's going to stay down there. Part of our application required a video. Tia and Jennifer put together this video. Jennifer's father has a background in multimedia and so she is definitely a key player in making this happen. The video is only 1 minute long. If you allow me here, I'm going to play it.

video is played

The judges reviewed the video and they liked it. The video is now on YouTube and the whole world is looking at that video and seeing SIU's name. This opened the door to the next phase. We're into phase one now. Dr. Anderson and I submitted a proposal February 1st for \$1M. Only 15 teams will be selected out of 1125 registered international teams. These are not students, they are companies so the criteria has been raised. We have to show a process that can upscale to the Gt level and that is profitable. We have to get a third-party reviewer for this. We have to verify that what we are saying is accurate and that we are not lying. We got a reviewer from Springfield. The reviewer came down here, checked all the numbers and he gave us a thumbs up. This process is not carbon neutral, it is carbon negative. When you hear people say we are carbon negative, they are not including the parasitic load. The winners will be announced April 22nd. If we win phase 1, we go to phase 2. In 2024 and 2025 we will be going after the \$30M and \$50M awards. That's where we're at. The American Energy Society gave a nod to SIU last month. The XPRIZE and the Elon Musk brand has brought a lot of attention to this. Thank you Gary for helping us through this process. Any questions?

Research Spotlight Questions:

McCubbin: That's fantastic! I do have a question. I teach environmental law. One of the potential concerns about CCS is contamination of groundwater. Any implications here?

Hamilton: Well, one of the benefits is that it is a liquid. It doesn't want to expand and it doesn't want to get back up from the ground. Therefore, we are targeting abandoned oil fields, which are domed areas that are already sequestered from drinking water systems. You don't get your water from oil fields, so that's the thing. We're pumping into these areas. A lot of oil wells have salience systems in there, so we're literally pumping water into water. It's a very low concern. Our heaviest concern was building the facility. After that, as long as there is volume down there, we can do it.

Ellsworth: So just to clarify, it's the liquid that you're pumping? Then with the microbes, you're just verifying that you won't disturb microbes that are naturally in the ground? Or are you feeding it to microbes and then pumping?

Hamilton: Yeah, we're not pumping down any microbes to do the sequestering and modifying. I'm a little biased because I like researching carbon and there actually is a huge disturbance per day with them. My job is to make sure we're not causing any ecological harm by modifying the microbes down there. The subsurface microbes are robust and hungry. As long as that stays true, we are recharging what we depleted years ago.

Shaw: Scott, I found this interesting myself. How long does this take?

Hamilton: We'll, that's part of the student project. We are going to try to determine the time frame. The current studies we have are one month long. Even in one month's time period, we have witnessed at least 25% conversion of the material to normal products. Again, I'm using microbes from Nevada. I'm working on getting microbes from Illinois. We are going to have to tackle different microbes from different environments and carbon sources. There are a lot of variables. One of the things that we have to emphasize is in XPRIZE we can go in many different directions. Give us fair consideration that we've picked one way of doing it. This doesn't represent all the different ways we can do it. That's how we are different.

Shaw: The processing doesn't have to be at the drill point? Right? You can process it at one place and then carry it to wherever it needs to be deposited underground?

Hamilton: Yes, and it will be easy. you don't have to have a pressurized container or sky pipe. There are a lot of benefits. But we are small so we have to build ourselves up and show our presence.

Adjournment

Shaw: Any other questions or comments?

Shaw: Hearing none, thank you for your time and best wishes on your project.

Shaw: That comes to the end of our agenda. Any other questions from the body?

Shaw: Hearing none, have a great break and see you next time.

Meeting adjourned at 9:42 AM