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SPEAKERS

Venki Uddameri, Alex Ortiz, Brad Ewing, Tulsi Oberbeck, Kay Tindle, jdealmedia, Christie Bratcher, Bell Canyon, Leonard Levine, Carlos Galdeano, Danny Reible, Raj Khare, Marshall Watson, Cui Romo

Kay Tindle 01:23

Good morning, everyone. Thanks for joining us this morning. We still have several trickling in so we'll give everyone a chance to join. All right, welcome, everyone to our second meeting of the Texas Produced Water Consortium. We're happy to have y'all here this morning. And we look forward to the conversation regarding membership structure and plans for the consortium moving forward. So with that, I will turn it over to our faculty co directors that are on the call today, Marshall and Venki. If you all don't mind introducing yourselves again for those that might have missed our meeting last week. And then we can jump into our discussion this morning.

Marshall Watson 03:23

Oh, sorry.

Venki Uddameri 03:24

Go ahead,

Marshall Watson 03:29

Marshall Watson, I'm chair of the Bob L. Herd Department of Petroleum Engineering and one of the co-directors in the program.

Venki Uddameri 03:39

I'm Venki Uddameri, professor in civil environmental and construction engineering and the Director of the TTU Water Resources Center. Okay, back to you, I guess.

Kay Tindle 04:06

So I'm Kay Tindle, Assistant Vice President for Research at Texas Tech University currently filling in for our soon to be started project manager for the consortium. Mr. Rusty Smith has accepted our job offer and he is starting this Friday on October 1. So we're very happy to have him and we'll be onboarding

him. Very, very quickly. He's already jumping in. So we're looking forward to that. Anyone else at Texas Tech like to introduce themselves?

Danny Reible 04:44

Danny Reible, a professor in engineering and also Horn Professor and I'm playing an advisory role in this effort.

Brad Ewing 04:56

And I'm Brad Ewing also at Texas Tech University. I'm an energy economist in the Rawls College of Business. And like Danny, I'm also playing an advisory role in this consortium.

Christie Bratcher 05:09

I'm Christie Bratcher, and I'm the Associate Dean for Research and the College of Agricultural Sciences and Natural Resources. And I am also playing an advisory role. And then we have the third faculty co director is Eric Bernard who is in landscape architecture. And he couldn't join us today due to a death in the family. So I guess I'll be representing him today also.

Raj Khare 05:36

I'm Raj Khare, Assistant Dean in College of Engineering, my role is somewhat similar to Kay. And the I'm coming at this from the administration side.

Kay Tindle 05:56

Excellent. With that, I'll turn it back over to the co-directors to lead our discussion this morning.

Venki Uddameri 06:03

Yeah, let me go ahead and make a quick presentation, can I share my screen? Think the presentation should be visible. So just before us, was there, can you see the presentation? Right?

Kay Tindle 06:34

We can see it. Thank you.

Venki Uddameri 06:36

Yeah, so just wanted to give a quick update. For those of you know, those of you who weren't there the last meeting, I know many of you were here. But the idea is that the water demands in Texas are certainly growing, we anticipate major deficits, particularly in the West Texas region, because our resources are limited to groundwater resources, which are fast depleting in the Ogallala Aquifer. But we also see a new substantial source of water being available, particularly the produced water. So the key question then becomes, you know, how do we put this water to the maximum beneficial use possible? There's a lot of work already being done in terms of like the use in this water in hydraulic fracturing operate, you know, operations. But can we extend this to other areas, particularly non-oil and gas related activities, including agriculture, municipal water use, and extra water use and such. So the Texas Produced Water Consortium kind of came out of that idea that many of you worked with Senator Perry, was created with Senate Bill 601, during the 2021 legislative session that just ended. And the consortium was charged to study the economics of the beneficial reuse of water technology needed for

those issues. And then after October 1 2022, the first part was to look at the economics and technologies, their technology, how much does it cost? Is it feasible? And after that, get into more of a research and investigation more to see what can happen, you know, how do we improve this process even further. And so the report, we are charged to produce a report no later than September 1, 2022. That's less than a year from now. That suggests changes to law in terms of how to enable beneficial uses, guidelines for establishing permitting and testing standards, economically feasible projects, identify a pilot project to show how these operations can be done, and then come up with an economic model for use of this resource efficiently while being protective of environmental health, public and environmental health. So the consortium structure, Texas Tech is the administrator of the consortium. We have a Stakeholder Advisory Council, a Government Advisory Council, again, and then we have a consortium and consortium members. So that's the overall structure. So as we've said, there are three co directors on this. You're happy to note that Mr. Rusty Smith will be joining us as our executive director and then we've got the technical and economic Steering Committee, which comprises of Dr. Bratcher, Dr. Ewing and Dr. Reible. So certainly we want you to participate. The consortium seeks input on a broad range of issues. Membership structure as I said is being worked out. We had some initial drafts that was sent out to you. This meeting is in particular wanting to learn about your thoughts and ideas on you know how we should work together and how should we move forward and then look at some of the committees and subcommittees structure to help organize ourselves better. So by statute, we are required to have a government Advisory Council which is in place. We have a stakeholder Advisory Council, which includes representatives from oil and gas, ag, industrial water, environmental. So literally the entire lifecycle of that produced water, if you may, from cradle to grave, and then a technical and economic steering committee. Again, these are members appointed by TTU to provide economic and scientific expertise and then consortium members who will join in as members and receive access to data produced by consortium research investigators subject to, of course, non-disclosure agreements, which tend to be central in this type of work. So for the first year, we have proposed a membership fee of \$1,000. And this will be from October 1 this year to September 30 of next year. We have identified four major committees: Policies Committee, the Standards Committee, the Technologies Committee, and the Economics Committee. Of course, these are broad, so we would expect subcommittees to be formed and look at things in more detail. And this first year, our goal is to also get the consortium members together to determine what the fee structure is going to be and how we are going to proceed moving forward, because the expectation from the legislature is that they're going to seed fund us this first year, but then increasingly, this has to be self-funded effort. So clearly, for such an effort to happen, the industry and other stakeholders have to see benefit in what we're doing. And for me, this is exciting, because this is use inspired research, we are going to be looking at user problems and trying to develop what the research agenda should be and how we should tackle this problem moving forward. So with that, Marshall, do you want to add anything to that? I hopefully short introduction of...

Marshall Watson 12:38

Sure, I mean, obviously, I think everybody is aware or may not be aware of the overall reaching issues that Dr. Uddameri just spoke of, but one that the oil and gas industry is seeking to work with agriculture, and end users here of water in the West Texas region together to come up with a solution that meets everybody's needs, in oil and gas, in addition to wanting to be more environmentally friendly, and finding ways that I think all the companies are striving to work with on the ESG parameters that they are

as equally interested as agriculture is developing up standards and methodologies to come up with clean water that could be used. From another reason they need it is they would rather see useful benefits of the water is as opposed to injecting it. Most of you may be aware of the seismic activity in the Midland area that they're having right now. And this is strictly due. It's much mis-represented in the media. The media blame it on hydraulic fracturing and has nothing to do with hydraulic fracturing. It only has to do with the injection of water, mostly in deep reservoirs such as the Ellenberger, which is pre-cambrian, rock that, no, I'm sorry, I just messed up all my geology. It's what the oldest rock right on top of basement here. But what's happening is as we inject near basement, it finds its way into existing faults that are in the basement, which are causing the seismic activity and in this recent activity noted in Midland, was at depths of a couple miles. So obviously, hydraulic fracturing is at a depth of maybe a mile half at best. And so it's not associated with hydraulic fracturing. It's associated with injection of water. So the win-win situation here is that if we find technology to get water usable, then both agriculture industries and also the oil and gas industry win. So what we need to realize is obviously one of those, all those, their policies, so is there existing laws and administrative issues that are preventing us from using the water to standards. So what kind of water do we need for each type of use? Such as agriculture, that's obviously straightforward. You know, we've got food, we have food crops, and we've got non-food crops, so that water is different, we have water that's available for roads. We have the issues of drinking water, which really I think all of us realize that may not be economically attainable, at the present time. Then, of course, we drift into technologies to recycle and use this produced water. And obviously, technologies are going to be different depending on the type of standards you need for each application. And then obviously, economics, it's got to be a win-win situation for everybody at hand here. So obviously, you can see the needs for, in this membership, because members are expected to join one of these committees, the policy, standards, technologies and economics as Dr. Uddameri. just spoke of, and contribute to that. So with that, I will turn it back over to Kay, if you want to direct the meeting where we ought to go to next. I think we had an agenda if I'm not mistaken.

Venki Uddameri 17:07

She might be muted.

Kay Tindle 17:09

Yes, I'm muted. Okay, so, um, I think we are at the point of opening it up for discussion, to discuss this proposed language for year one. We'd especially like, we had a few conversations with Tulsi with TXOGA, so we'd really appreciate hearing from you Tulsi if you're on, I didn't see. And others that might have questions or comments, we would like to open that up at this point.

Danny Reible 17:59

You want to display the membership agreement as it sounds for reference?

Kay Tindle 18:03

This language right here that's open. So not the technical language, not the technical document. But this general language of this first year, this inaugural year having a membership fee of \$1,000, to participate and be a part of the subcommittees or one subcommittee and then working together to determine the membership fee and the structure for years two and beyond.

Leonard Levine 18:41

I have one question. This is Leonard Levine from Gulf Coast Authority. Was this, will a member be defined as an organization or as an individual in the organization?

Kay Tindle 18:54

As an organization. That's a good question.

Venki Uddameri 19:02

individuals from that organization can participate in subcommittees.

Kay Tindle 19:09

Alex, you have a question?

Alex Ortiz 19:12

Yeah. Hi, Alex Ortiz from the Sierra Club. Is there going to be a limit for members to only one subcommittee? I guess that's sort of...

Kay Tindle 19:25

No limit.

Alex Ortiz 19:26

Okay, cool. Good to know.

Bell Canyon 19:32

Hey, Steve Jones from Waterbridge. Yeah, looking through this. I think this all makes sense. Some of this, some of the policies, standards, et cetera, really involve the Railroad Commission. The Railroad Commission also had some legislation passed, I think, directing them to come up with standards for produced water, commercial produced water, ponds. Are they going to be participating in this?

Kay Tindle 20:06

Yes, we have a government agency council, that per the statute that includes a Railroad Commission representative and those that are required to be on that government agency advisory council. Those are not paying members, because per the statute we have, and there's the list, thank you Venki, on the right hand side of the, different government agencies that are required to be a part of this consortium.

Bell Canyon 20:38

Great, thank you.

Kay Tindle 20:41

We had a question in the chat. Has there been a consideration of having the membership fee tied to company size? At this point with this first year, because we really need to move forward towards our deadline of September 1, 2022, for the report, we are just keeping it at \$1,000 flat fee. And then as part of the conversation as we move forward discussing structure and how things will look like in the future,

decision making processes and the like at that point, then we can have this discussion about tying maybe perhaps tying in membership fee to company size or not. So that's at the discretion of the members that are part of this inaugural year.

Tulsi Oberbeck 21:36

Hi, Kay, this is Tulsi with TXOGA. Thanks for working with us on this membership agreement. Some of the questions that we're getting is kind of the timeframe on when you're looking to have this, I guess, officially released for members to sign up. I know, we're still collecting feedback from our various members. There's quite a few of them. So I know we're looking to, just, we have a few more thoughts, we'll probably want to add, but, you know, knowing the timeline would be helpful. And another thing that was asked was, is there an anti-trust provision in the membership agreement or a conflict of interest provision? I, we didn't notice that. But it's a lengthy document, so we could have missed it.

Kay Tindle 22:23

So to your first question, the answer is as soon as possible. So we want to start working with individuals to execute the membership agreement. Start working with organizations to execute the membership agreement between us and the organization as soon as possible so we can get started on these subcommittees. For your second question. I'm going to kick it over to our one of our lawyers on the call, I believe Cui you're on if you could speak to that that would be appreciated.

Cui Romo 22:59

Yes, there is not at this point in time, there is no conflict of interest language. And let me double check on, I don't think there is any antitrust language either...no there is not. Now if TXOGA has anything that they would like to offer, we're definitely open to any language that anybody feels that needs to be into the, in the membership agreement. But we'll have to go ahead and review that pretty quickly and see if that really kind of fits with where, what we would like to do with it, with the consortium.

Tulsi Oberbeck 23:41

Thank you for that. Do you think if there are additions, you would amend it for everyone? Or if there are special tweaks that need are needed for certain members? Would that be an individual agreement, type of situation? How do y'all plan on handling that?

Cui Romo 24:00

We, in my experience and what we've done other consortiums, we really want to keep this a one, I mean, a membership agreement, all the members really should be on the same playing field. So we would want to keep it same for, pretty much for everybody. So we'd like to have language there that would kind of work for every member. There might be some language that could be put in that is really kind of directed towards certain members that won't hurt or basically affect the other members. I have seen language like that in other consortium's membership agreements, to where it really is kind of directed and gives a, gives a uh, gives an option or condition for certain types of members because yeah, we do have educational institutions on here and then if there is private companies, and even other governmental entities, we kind of want it to be a one size fits all. But we also do not want to keep negotiating every single membership agreement that would take a long time. And it would all of a

sudden, people will be on different playing fields on this, we really kind of want to be one consortium and one membership agreement, hopefully a one size fits all,

Danny Reible 25:24

Cui, however, when we move to situations where we're looking, perhaps in subsequent years and demonstrating technologies, you're presuming that there will be some different requirements for that, perhaps non-disclosure, specific agreements that would come up at that time, but not in this initial membership here.

Cui Romo 25:46

And definitely, and I think, can't remember everything that's in the initial agreement...I should because I drafted it...but we should have certain situations. For this inaugural one, we did want to keep it simple to get everybody in and get the committees, and everybody going to try and get participation, and see which direction this is headed. And we do plan on having probably a little bit more robust membership agreement later on. If there is anything during this inaugural year, where we need to have non-disclosure agreements for certain subcommittee members or companies that are going to be talking about certain areas, we will definitely have a nondisclosure agreement that we can do a multi-party one for that area. I don't know if everybody that would be part of the consortium will be in every single discussion. But if that were the case, we would go ahead and handle that, when that comes, comes around. Yeah, so there will be certain situations where there will be either an additional document or for year two, a little bit more robust membership agreement that probably does handle certain situations. I hope that answers your question, Dan. Anything else?

Kay Tindle 27:22

You have a couple of questions in the chat. SB 601 says the consortium shall solicit participation from environmental interests. What measures will be taken to accomplish this?

Venki Uddameri 27:41

Through the consortium membership is open to you know, all interests, everybody who's interested in water that includes environmental interests, we have reached out to some of the key players like Sierra Club, Environmental Defense Fund who are on the call today. So you know, we'll be happy if this, if y'all can help us spread this word around and get more people everybody who is involved in, or they have an interest in this, come to the table and participate in those subcommittees. So there's no, we're not. This is not just an industry Consortium. This is a much broader consortium that involves all aspects of water. As Dr. Watson mentioned, what we are seeking are those win-win situations where we can find water being beneficially reused for betterment of Texas, and of course, we want to do it safely and effectively as well. So certainly, you know, everybody has a voice, you know, coming into the subcommittee's so, so we certainly are looking forward to participation from environmental interests. And if there are people, you all know, that should be in the table that we have not, we have missed out, I think we passed a pretty broad net, a wide net, but if there are, we'll be more than happy to hear from him. You can send it to the TXpwc@ttu.edu. That's our generic email address. All the people, key personnel on this project will get, will get to have access to that email and we'll look at it and very soon.

Marshall Watson 29:42

Well, yeah, I was just gonna further comment to that. I mean, I think the engagement is the joining our members, members joining one of those subcommittees that are noted on that page.

Kay Tindle 29:58

Thanks Marshall, we have another question in the chat. How will the committees be structured/governed? Two-part question I'm asking you the first part now.

Venki Uddameri 30:10

So the first step is to identify who the members are, who are the members who are interested in being in that committees. Certainly they will be TTU representative from the executive team on one of these committees. And then the next order of business would be to identify chair and it doesn't have to be a TTU member in my opinion, but we'll have to work those details. And then try and find if we can create subcommittees if there are key questions that come up in that committee and say, these are the four things we need to do. As far as the policies are concerned, you know, there might be a group that wants to look at what have other states done, for example, in terms of policies, what worked, what did not work? What are some of the key elements in the state of Texas that we need to look at, so we could create some subcommittees inside. So at this point, it's pretty flexible. Partly because this is a new problem. And partly because we want to make sure we are not driving it. We want the stakeholders to drive this process to the extent possible. So

Kay Tindle 31:19

Just to add to that. I think he said our internal leads for each of these policies is Eric Bernard. Our I guess we'll call them coordinating leads. So making sure that we're including all of the right players in each of these subcommittees for standards and technologies. For both of those, we have Marshall Watson and Venki Uddameri. And then for economics, we have Brad Ewing. And to respond to Tulsi's second question, how will policy recommendations be recommended or approved? So the subcommittee is putting together the recommendations, that's their charge, but per the statute, they have to work in coordination with the government agency advisory council. And so I'm assuming that that is kind of the oversight board that would then be approving what will be recommended. We have another question in the chat that says, could you please show the slide that lists the faculty members for the technical economic advisory committee?

Venki Uddameri 32:40

What was the...

Marshall Watson 32:43

Yeah, which one has the names by each of these, Venki?

Venki Uddameri 32:48

I don't think we have a slide

Marshall Watson 32:51

I know there's an email that, uh...

Kay Tindle 32:54

Oh, that's just an internal. Yeah. Not including the other. So for the statute, we are to work with other state institutions of higher education. And we will be soliciting members from those institutions. And we're currently putting that together. We just are working on reaching out and pulling people onto that. There was a question from a previous conversation with TXOGA, of would we include industry representatives on that technical and economic advisory committee?

Venki Uddameri 33:38

Absolutely. And, because you are the people who use the technology, and so it's particularly important that you participate and tell us what has worked with some of the technologies, what has not worked your use cases, and the lessons learned, play a very big role in moving this forward. So we certainly look forward to industry participation.

Kay Tindle 34:04

And on- Sorry, sorry, Venki.

Venki Uddameri 34:09

Yeah, one of the things that's part of this charge is not to create new technologies that may or may not work 30 years down the road, you know, that Senator Perry made it clear that we are looking for technologies that currently exist currently that industry can, industry has access to in terms of using it and then seeing how can we refine it moving forward. So certainly we are very interested in having that participation from the industry and input from that industry, from the industry on that.

Kay Tindle 34:39

Sorry. I was just going to add to that, that this is this is part of this first year discussion of how will we identify and how will we determine who will serve on this technical and economic steering committee and what, maybe there are certain roles and responsibilities for this committee that would then preclude individuals or organizations from then partaking in other activities, maybe some, some funded activities for projects and things like that. So all of that will be worked out in this first year. And we'll be working with our government agency advisory council on that as well.

Venki Uddameri 35:28

And I also want to add that, you know, industry member, consortium members from the industry are welcome to join other committees as well, because technology doesn't work in isolation. It works in conjunction with policies, standards, and of course, economics. So certainly, don't restrict yourself to technology, your work, you know, if you see that there are opportunities in other committees, please have your representatives in there.

Kay Tindle 36:02

Were there any other questions regarding this language?

Joe de Almeida 36:07

Well, this is Joe de Almeida from Oxy, I just wanted to offer a comment, please. And it pertains to that line there that says, that speaks to economics. And when TXOGA had submitted its thoughts and

helping to develop the Senate Bill 601, although I understand the model here for utilizing produced water efficiently, but we were thinking more in terms of economics of technology. In other words, it's not it's not a challenge to find technology to clean water to anybody's standards, to be frank and honest about it. The true challenge is, we it's going to be very difficult to find a cost-effective technology to render the produced water for any fit for purpose that we might be think of thinking of whether it's edible crops or not. So I just wanted to add that, hoping that it's a helpful comment that it's, I don't think many of us think of it as a model as much as it is the cost efficiency of the technology.

Kay Tindle 37:11

Yeah, absolutely. And I- go ahead, Marshall,

Marshall Watson 37:15

No, I, hopefully, I'm sorry, I didn't make that clear in my introduction there. But yes. Obviously, working in petroleum engineering and been in industry myself for many years, totally understand the concept of the, you know, a lot of people's perception of academia as we come up with a lot of these great ideas and inventions that are totally not economic. And it couldn't be further from the truth. I mean, there's no question that both myself and I've worked with Brad Ewing, he's also on this call of at Rawls School of Business. And he's one of our advisors. And he's working, obviously, advising on this economics. So he and I've worked in many projects together in the past, looking at, okay, how do we marry technology and economics for everybody concerned? So there's no question that that is in the forefront of our mind-thought is far as coming up with technology that is economical.

Joe de Almedia 38:19

I thank you for that, Marshall. Appreciate it.

Kay Tindle 38:32

Okay, do we have any questions about the actual membership agreement that we sent out? Whenever I sent that out last week, I believe.

Leonard Levine 38:46

This is Leonard Levine with Gulf Coast again, Authority again, I have a, has the confidentiality piece of this, has been vetted against what the open records requirements are for public entities? That's for the lawyer.

Cui Romo 39:18

I am here sorry, took me a second to get the buttons. The, we have at Texas Tech University, we have a mutual non-disclosure agreement that we can set up for multi-parties. We have language in there that basically talks about the Texas Public Information Act. We don't have it, at this time, I don't have it set for any Public Information Act. But we do have a clause in there that discusses that if we need to, because I know a number of potential members are probably from New Mexico, or even other organizations that might be, have other Public Information Act requirements or even Federal Public Information Act requirements. We'll go ahead and add some language to that, that that covers all of those. There will still be a requirement, of course, for any, even Texas, Texas Tech, we, we are still required to notify organizations and private industry that certain information might be subject to

disclosure and then be allowed to file for, you know, protection or protective order on that. So that's what our language usually says. And hopefully that answers your question regarding that.

Leonard Levine 41:00

I guess my question is, is it going to be incorporated into the membership agreement section under confidentiality?

Cui Romo 41:07

I'm sorry, it's not at this point in time. But if that is one of the, if that's something that we need to look at, and go ahead and add, we can go ahead. And like I said, we'll go ahead and take any options and anything that anybody thinks that needs to be in the membership agreement, we'll review and then have another one for everybody else's review again, soon. And we'll try and get this done pretty quick.

Leonard Levine 41:39

Good, thank you.

Venki Uddameri 42:00

Any other questions about that?

Tulsi Oberbeck 42:05

If we have additional language for the membership agreement, when should we get that to you, like what's, what's the timeframe? I'm assuming this week, but is there a specific date that we need to get you agreed to language by?

Cui Romo 42:26

I think by Friday would be really good. Because that would be October 1, the membership agreement at this point in time since this is annual, and we've kind of been, it's gone pretty quick, since the senate bill was passed this summer, and really kind of set forth September 1, we do want to, we kind of have to keep year one and year two, along with Texas' fiscal year. So members agreement technically would start, be effective September first, but I understand we're almost set to October 1. But it's been, been kind of a quick deal here in September. So if by Friday would be good, give us some a little bit of time to quickly go through those and, and make any adjustments that we think that would be appropriate for everybody, for separate, I mean, a single membership agreement. So I think by Friday, by 5, by close of business would be would be perfect. Even if it came over, in over the weekend. We'll still try and look at that. Look at all that stuff.

Venki Uddameri 43:44

And I'm assuming the members can join later in the year, Cui, if there is a new member who wants to come in, not now but you know, some point later in the year, is that, that's allowed, right? Just clarify that for the sake of the members, of course, they'll miss out on some of the exciting action, but, but...

Cui Romo 44:14

And right now, we don't have a, at least, I don't I don't have any prorated language in there. That might be something that we could we could think about because we definitely want more members, membership...

Venki Uddameri 44:32

Regardless of the fee structure, if they want to say come, you know, they come to hear about this later and say January. Exactly. I mean they can, right, yes. Yeah, there was a... I was looking at a couple comments in the chat and just wanted to reiterate that members are encouraged to join more than one of the subcommittees. Again, as I said, there is no restriction on how many subcommittees members can work. Again, if you're an individual who is part of an organization, you are allowed to be part of the subcommittees, so you can participate in this subcommittees. So.

45:53

So, Kay, just a logistic question... so...20 employees, will there be one membership fee or 20? Membership fees is the question. I think it's by organization. So the organization for, at least for the first year, the organization would get a membership and all the individuals who are involved with that organization get to participate.

Kay Tindle 46:26

Correct. Yes. So, it's by organization, doesn't, you could have 100 people. That means we have 100 people helping and working towards helping us find the answers for the report. And that's fantastic. And it's just for this first year. And then as we move along, we will identify a different, or, a membership structure 2.0. maybe. We have another question, will the consortium be open to participation by higher ed institutions other than Texas Tech? Yes, as I mentioned before, per the statute, we are to work with other states systems of higher education. And so we will be reaching out to make sure that those systems have a representative on our initial Texas, technical and economic steering committee for this first year. And then we will also make that part of our discussion with our membership structure in year two and beyond.

Venki Uddameri 47:31

But higher ed institutions can join in as members.

Kay Tindle 47:35

That's right.

Venki Uddameri 47:51

There was a question on will BEG or some other organization capable of causing seismic causation be part of the committee? This seems like a missing piece. Yes. I think this issue happened after 601. But we certainly plan to have a broad representation from all universities. So we recognize the role that BEG has played in this space. So we will certainly try to have them involved. To the extent they want to participate. So just a logistic question there. Okay. Perhaps we should have some discussion on this. But I'm assuming once the membership, at least once the membership language is straightened out, and then we have those memberships in place. We'll be reaching out to the members in terms of like committees and who will participate in the committees, is that what your thinking is, or...

Kay Tindle 49:15

I believe once we have the membership agreement enacted between Texas Tech and said member and we've received the membership fee, we'll provide them with a link to identify who from that organization and which committee they would, or committees, they would like to be a member of. And we, our plan is to start these subcommittee meetings as soon as possible. It would be great by the end of October to have all four subcommittees up and running and, with plans and internal deadlines and things of that nature, that might be my optimistic, idealistic view. But I think it's always good to have maybe, maybe set the bar a little high. So we can, can work towards that. And I just want to reiterate that we are, we have our charge from Senate Bill 601. And so there might be really beneficial tracks to pursue of research that might not necessarily be in the scope of this first year, we have to very strictly follow the charge that's set forth by Senate Bill 601. But these other paths of research might be something that we could then pursue in years two and beyond.

Marshall Watson 51:31

Yeah, good example just to give everybody an idea, we talked about policies like, okay, what kind of policies are we talking about? Well, one was, there was a issue that had that had to be cleared up as to, that for the benefit of reusing produced water for fracturing, so there was, there were barriers set up and state rules/laws...I'm not an attorney, but they prevented that. There was a barrier for taking all this produced water, basically forcing operating companies to use fresh water when they were more than happy and wanted to use produced water. So the state came in and, and clarified this on a ruling that, who actually owned the produced water. And so the ownership of the produced water clarified that it was the producer, and that allowed them to utilize the water not only on the existing oil and gas lease but adjacent or nearby oil and gas leases, without having to worry about going through, well who owns it? Is it the landowner, is that the royalty owner, etc. So that would be a good example of a great policy that alleviated producers or almost forced them from using fresh water and allowed them to use produce water and fracturing operations.

Venki Uddameri 53:12

Yeah, the state has also put out some similar policies in brackish water reuse and ASR aquifer storage and recovery. So some of that similar language has to be extended to produced water if you're thinking about long term storage and use of this resource in other areas. We are almost nearing our meeting end time. So there are any other questions? Happy to entertain them.

Carlos Galdeano 54:11

Got a quick question, this is Carlos Galdeano with ExxonMobil. So, in terms of the Subcommittee meetings, how often do you think those...once a month, once a few weeks?

Venki Uddameri 54:22

So that's a good question and, a lot of that would depend on the subcommittees and once we have the subcommittee's in place. They know the charge of what they are they'll be working on and, and that would kind of dictate how, how, how frequently the meetings would be or how productive they have meetings at certain times. So, so I think that will be worked out individually at the subcommittee level to make sure that the time is being used optimally. And what, what time would work for the members who

are part of the subcommittee. So, but we are under a fairly tight deadline, because the report is due next September. So assuming this, you know, we will always need some time to look at, you know, what the members of what the subcommittees have given the report to the subcommittees and then aggregate it, we're probably looking at like a June or July deadline, end June, end of June probably. So, at the very, very latest, so, so it will be an aggressive timeline for sure. Just I think we, at this point, it's unclear as to what that times would be. So there was a question related, this seems like there might be a need for a subcommittee that addresses questions on environmental impacts. Such would include earthquakes, etc. We can certainly take that into consideration, although we'll discuss it with the executive committee.

Kay Tindle 56:19

Well, I just I want to reiterate what I said before that we have a charge by the statute by Senate Bill 601. And so we have to follow the terms that are included in that statute. However, this could definitely be something that is part of year two and beyond. I'm not saying it's not part of year one, I'm just saying our primary focus is fulfilling the requirements of Senate Bill 601.

Venki Uddameri 56:55

If we, if we end up showing strategies for maximizing the reuse of this water, we will be solving that problem as Dr. Watson said, a lot of induced seismicity is coming from injection of water into deeper formations as opposed to the production of oil and gas itself. So, so indirectly, I think that is one of the benefits that will come out if we, if you focus on maximizing the reuse of water we can directly solve that problem. So I think many of you have a hard stop, but...

Kay Tindle 57:55

If there's nothing further, please feel free, I dropped Cui's email address in there. So if you have questions specific to, or comments specific to the language and the membership agreement, then please direct those to him. If you have other questions regarding more of the structure this first year, subcommittees, things of that nature, please email TXPwC@ttu.edu. And one of us who has access to that mailbox will respond. With that, again, we want to thank you all for your time, this morning. We really appreciate the enthusiasm and the interest that we have seen over the last two meetings and we look forward to partnering with you as we move forward and work towards fulfilling the expectations that have been set for us. So thank you all, take care.