129TH MEETING OF THE

NATIONAL PETROLEUM COUNCIL

THURSDAY, DECEMBER 12, 2019

9:00 A.M.

WILLARD INTERCONTINENTAL HOTEL

WASHINGTON, DC

Reported by: Linda Metcalf, CER

C O N T E N T S

P R O C E E D I N G S

- - - - -

(9:00 a.m.)

MR. GREG ARMSTRONG: So good morning, ladies and gentlemen, and will the 129th meeting of the National Petroleum Council please come to order. I want to welcome all the members of the Council, our honored guests, members of the press and the public. We have a very full agenda today to lead us through what I think will be a very productive meeting and a lot of information to cover.

One of the highlights of today's meeting is that we have the honor of having Secretary Brouillette joining us, and I'll make a few more comments about the Secretary here in a few minutes, not before we dive into today's items -- the items on today's agenda, I have a few logistical and administrative issues that we do need to cover.

First, I want to make the customary safety announcement. There are no scheduled fire alarms today, so if the alarm sounds, we will evacuate through the doors at the back, up the stairs, through the lobby, to the street. The rally point will be across the street in Pershing Park.

Second, if there's no objection, I'll dispense

with the calling of the roll, but I will note that for the members of the Council, the check-in at the Buchanan Room will serve as our official attendance record. Any member or observer for a member who has not checked in, please do so before you leave so to ensure we have an accurate record of today's attendance.

Third, I want to note that as in prior meetings today we have an online audience that will be able to watch the livestream of today's proceedings. The audience includes Council Members unable to attend today, as well as many of the individuals who contributed to these two study efforts that we'll consider this morning, and we welcome their attendance electronically.

And then, finally, I have the honor to introduce to you and for the record the participants with me at the head table. To my right, we have the Honorable Dan Brouillette, Secretary of Energy, whose remarks you'll hear just shortly. Next is Larry Nichols, who is the NPC Vice Chair. Next to Larry we have the Honorable Steve Winberg, Assistant Secretary for Fossil Energy and Government Cochair of the CCUS's study Coordinating Subcommittee.

On my left is Alan Armstrong, Chair of the NPC

Committee on U.S. Oil and Natural Gas Transportation Infrastructure. Next is John Minge, Chair of the NPC Committee on Carbon Capture, Use, and Storage. And, finally, Marshall Nichols, Executive Director of the Council, and without whose assistance I could not have made it through the last three years.

So the first order of business is to hear from the nation's 15th and newest Secretary of Energy, Dan Brouillette. Before being chosen by President Trump as Secretary of Energy, Dan served as the Department's Second-in-Command and Chief Operating Officer. Dan also served as Secretary Perry's Designee and the Government Cochair on both of the study committees, so he's very intimately familiar with these. And prior to returning to public service, Dan had a successful career in the private sector with companies such as Ford Motor Company and USAA, and it's with great pleasure that I introduce to you the Honorable Dan Brouillette.

(Applause.)

SECRETARY BROUILLETTE: Wow, thank you, Greg. Thanks for that kind introduction. And thank you for the opportunity to speak to all the members of the National Petroleum Council. I want to first say thank you. Thank you for your leadership that you've shown

over the last few years and your outstanding service as the outgoing NPC Chair. It was an absolute honor for me to work with you, and I really appreciate the good work that you have put in over these past few years. We're going to miss you. I know you're not going very far, but we're going to miss you as Chair, so thank you for that.

You know, two years ago, then-Secretary Rick Perry asked the NPC, this organization, to conduct studies on two key energy imperatives for our country. They included bolstering the infrastructure that delivers our energy and commercializing carbon capture utilization and storage, or what we refer to as CCUS, to make that energy even cleaner. And I'm delighted that as we meet here this morning, as we meet here today, the initial drafts of those studies have been completed. I look forward to receiving them.

I witnessed firsthand the hard work and the dedication that was involved from the very beginning of this process, and I want to just take a moment and express my deepest appreciation to the members of the study teams for their invaluable service to our nation. I am very anxious, and I look forward, to receiving the studies and to looking at those recommendations.

I am enormously proud of the work that we

have accomplished during Secretary Perry's tenure. President Trump charged Secretary Perry and now myself -- I was sworn in yesterday at the White House, so this is very, very new to me -- with --

(Applause.)

SECRETARY BROUILLETTE: Thank you. Thank you. You're very kind. You're very kind. It's still a little bit surreal to me, so excuse me if I look a little bit dazed and confused from time to time.

But, you know, the President was very clear in his direction to Secretary Perry, and yesterday he was very clear to me as well. We want to implement -- he wants to implement what he refers to as an "all of the above" strategy that will increase the United States' energy independence. And I am beyond excited to share with you how we're meeting that charge at the Department of Energy and how we're addressing the challenges that lay before us.

The United States remains in the midst of what you know, because you're in this business, an unparalleled energy renaissance, one that is already transforming our nation and our world in ways that were unthinkable just a few short years ago, certainly within my lifetime. And within this revolution is a major progress -- is major progress, I should say, in

clean energy. We're producing our energy more abundantly, more affordably, and from a wider range of sources than anyone could have ever imagined just a few short years ago.

We're now the world's second-ranked generator of both wind and solar energy, and we are the world's largest producer of both oil and natural gas. Thanks to that -- give yourselves a hand.

(Applause.)

SECRETARY BROUILLETTE: Give yourselves a hand. Thanks to that incredible progress, in 2017, we became a net exporter of natural gas for the first time since the Dwight Eisenhower Administration. Since 2017, we've doubled the number of countries that receive USLNG, from 18 to 36 countries, and they now span five continents.

And since July of last year, stemming from President Trump's agreement with the EU to increase imports of US LNG, we've increased our LNG exports to the European Union alone by nearly 600 percent. This monumental rise is putting EU countries on a path to liberation from Russia, which has long wielded its energy supply as an instrument of coercion and subjugation.

Meanwhile, this enormous energy bounty has

kept global supplies reliable and prices stable for consumers, while marginalizing some of the bad actors like Iran in our global economy. And the same nation that leads the world in oil and gas production, the same country that has dramatically increasing its energy footprint worldwide continues to lead the world, including every signatory to the Paris Accord, in reducing energy-related emissions.

Add to this record a booming economy and unemployment at a 50-year low, and the conclusion is absolutely clear. We have proven beyond any doubt that we can grow our economy, we can develop our energy, we can make our environment cleaner, all at the same time.

What's driving this impressive success story? One simple word: innovation. Through innovation, we've increased our generation of renewables, zero emissions nuclear, and low emissions natural gas. Through innovation, we've made coal progressively cleaner throughout the decades. The CCUS study underscores just how critical this topic is. Using CCUS technologies, we can and we will drive emissions down even further. And I'm encouraged by the cooperation on CCUS that we're seeing both domestically and around the world.

Last year, I attended the Ninth Clean Energy

Ministerial. At that Ministerial, the United States, Norway, and Saudi Arabia launched a new CCUS initiative to advance global collaboration. And earlier this year, at the Tenth Clean Energy Ministerial, energy ministers from around the world and business representatives came together to support increased investments in CCUS.

And while the members also -- during the same period, the members of the Oil and Gas Climate Initiative announced their intention to collaborate on public-private partnership to accelerate CCUS technologies. And more recently, the leaders of both of these initiatives affirmed their intent to launch a CCUS initiative and industry worldwide.

We strongly believe -- this Administration strongly believes -- that CCUS has tremendous potential, and we are eager to see the full results of this NPC final study.

If we want to continue this renaissance, however, we must ensure that our energy infrastructure remains fully up to the job to delivering the energy that we produce. Those of you in business know this. Our production numbers are up tremendously. That’s beautiful, that’s great, that’s fantastic. If you can’t get the product to market, we’re going to have a

problem, and that's our challenge today. And it underscores the importance of this infrastructure study.

We at DOE believe that reliable, uninterruptible delivery of our energy is perhaps our most critical challenge. Ensuring delivery means, first and foremost, that we protect existing infrastructure from threats ranging from cybersecurity, cyber attacks, to natural disasters. DOE, as you know, is the lead agency responsible for that type of protection, and we continue to collaborate and coordinate with industry in the pursuit of the same.

And clearly your study recommendations on this topic will be of great interest to me, our department, and to the entire business community. But protecting the infrastructure we have, while critical, is still not enough to ensure reliable energy delivery. In order to do that, we must build infrastructure that we absolutely need, and industry has been playing a leading role here, making significant investments in critical infrastructure development across the entire energy value chain. And given our historic surge in energy supply, this is an absolute necessity.

But industry is being held back in certain cases from building enough infrastructure by what we

feel are onerous rules and regulations, and recognizing this problem, President Trump, through his executive orders on infrastructure, took serious steps toward removing them. But federal regulations aren't the only problem. We must counter those who would do anything to stop the use of many important sources of energy, from outright banning energy sources to filibustering and blocking the construction of necessary infrastructure. Certain bad actors are trying to slow job creators and decrease the benefits for consumers.

Just two winters ago, a tanker was docked in Boston Harbor -- I know that you all read about that -- selling Russian gas. Why Russian gas? Because New York State refuses to allow pipelines to be built that would transport clean, affordable natural gas from Pennsylvania to New Englanders who need it. Due to one state's extremist policies, the entire New England region is cut off from receiving cheaper American natural gas. Money that could stay in the United States to keep our family and friends warm in the wintertime could be used to sustain jobs in Appalachia, or even create them across the Adirondacks, is now going to a nation who continuously demonstrated its eagerness to weaponize energy as a means of domination.

Clearly we must deal with these threats to our energy delivery, and we are grateful to the NPC because your study aims to do exactly that. So thank you again for the tremendous effort that you've invested in two of the most critical energy issues of our time. It's our hope that as we look into the future our country deals with this thoroughly with both of these issues, making our energy cleaner and ensuring its reliable delivery by innovating our way to genuine answers.

Thank you for the honor of being with you today. I look forward to continuing our work together. Greg, thank you again for your leadership. Alan, thank you for your leadership. I look forward to working with both of you. Thank you.

(Applause.)

MR. GREG ARMSTRONG: Thank you, Mr. Secretary. Great remarks. Very great remarks. And as many of you know, as the Secretary said, he was sworn in yesterday, and so unfortunately his schedule demands that he goes and talks to the people he's going to be leading directly in the DOE. We thank you so much, and we look forward to working with you in the future. Thank you.

(Applause.)

MR. GREG ARMSTRONG: So our next order of business this morning is to address the reports that

the Secretary mentioned. The first is the NPC Committee on U.S. Oil and Natural Gas Transportation Infrastructure. We'll discuss the findings and recommendations, and we'll vote on the adoption of the proposed final report. Many members of the Council provided their outstanding leadership, as well as significant commitments of their personal time and their organizations' resources to respond to the Secretary's request for advice on this important topic.

Alan Armstrong, Chair of the Committee, will kick off the presentation and results of this comprehensive study, and I must just say, both for Alan and John, when I asked them to undertake the leadership of these studies, I think little did any of us understand exactly how broad and deep they would actually be, and I'm just glad they're both still talking to me.

So, Alan, if you'll lead us off there.

MR. ALAN ARMSTRONG: Thank you, Greg, and really thanks for the opportunity to get to chair this. This is pretty impressive to see such a large and diverse group of people come together to present such a -- what I think is a tremendous body of work that I think will inform us for a long time and I think provides some very important recommendations.

And so I'm just going to provide a real brief overview here on the Secretary's request and how we formed and structured to respond to that and how the study was guided from the Steering Committee level, and then Amy Shank is going to come up, and for those of you all that are not close and familiar, when the chair of the Coordinating Subcommittee is the one that carries most of the load in terms of leadership day to day on bringing people together on this, and it's really been my pleasure to get to work with Amy in doing that and see what a tremendous job she's done. And as Greg -- Greg always says, you have a cat-herding role, but the problem with that is many of those cats are actually lions and tigers. And so -- and no doubt -- no doubt -- there's a lot of strong opinions on the subject that we took on here.

So let me -- so this is the Secretary's request, and you can see here really at the top where we explain really the existing infrastructure and the need for additional infrastructures, the first topic there. And so think about that. That by itself was a pretty massive undertaking to describe the infrastructure in the U.S. today that we utilize to get products to market. And really everything from pipeline, rail, and marine traffic, tremendous amount

of effort that went on to describe that and just to start there.

Then, of course, the effort was to understand what changes were going to occur as supply developed in new locations and markets developed in new locations, and particularly, as we all know, we're lucky enough to have the markets that are now along the coast, which is changing the infrastructure dramatically here in the U.S.

Secondly was to review and understand any constraints and bottlenecks that would begin to exist as this was developed, and particularly constraints that might limit our ability to continue to produce and grow our production -- oil and gas production -- here in the U.S. And then, finally, looking at technology and what could be done to improve the safety and resiliency of our system and the efficiency.

And so all of these topics are large in their own manner, and then on top of that, you can see here the key questions that were thrown out, so -- from the Secretary as well. And so, again, supply and demand, infrastructure, a number of forecasts. You can imagine with all the changes going on in the markets today on both the supply and the demand side and the impact of concerns over climate change, wide, wide variety of

supply and demand forecasts out there that the team reviewed and tried to understand what impacts that would have long-term on U.S. infrastructure. Again, a question about what could be done, particularly the DOE's got some great technical resources, and trying to understand how and what both the industry and Government can do to continue to support the industry with technology.

And then, finally, and probably where a lot of the big issues are today is understanding at the regulatory front what can be done to streamline and help with the development of infrastructure, and as well looking at policies in the future.

So I would just say underlying this important request, as you just heard from the Secretary, is the tremendous bounty that U.S. oil and gas producers have created for our great nation. I often marvel at how far the oil and gas producers of our nation have brought us both in terms of our economy, low-cost energy, and yet often it feels like we've done something bad rather than something good from my perspective. And I will tell you, from my vantage point, I often wish there was a real, full appreciation for what's been done there.

Having said all that, the innovation, the

continuous improvement, the free markets and capitalism that we have here at home are very difficult to duplicate around the world. We are very lucky to have the structure and the capitalism because it truly is the drive and innovation that comes with capitalism that has continued the improvement here in the U.S. of oil and gas production. All of that bounty is fantastic, but it really can't be realized unless we can get the product to market in an efficient, safe, and low-cost manner. And that really was the underlying effort of this study.

And so we really are in a great position, and we sit and struggle with this issue like it's a problem, and, in fact, it's a huge opportunity for us to be in this position today where we're the nation's largest oil and gas producer and trying to figure out how we can continue to help our economies prosper here at home. But, importantly, as we look forward to the growing and emerging economies that are going to be looking for ways to grow their economies in a low-carbon environment, the U.S. has a tremendous amount to offer, but we've got to be able to get our infrastructure to the coast to help on that.

So this study really helps illuminate both the opportunity and the need to provide safer, more

efficient means to get our great resources to the markets here and around the world. So as we look at how we develop the structure for this, you can see here the Steering Committee and the four task groups that were developed below that.

And so for those of you not familiar at the NPC level, there was about 50 Council members that were assigned to this particular study, and from that, as you can see, we had about nine Steering Committee members engaged in this, and really the role of the Steering Committee members was to make sure that the efforts were adequately resourced and that when there was direction required on stickier issues, that the Steering Committee was there to help guide those difficult directions.

And I will tell you, I've been -- I was so lucky to get to have such a great Steering Committee to get to work with, very diligent and very thoughtful engagement on their part to keep the study moving ahead, even at times when there was difficult issues, like how we address climate change within the infrastructure. And I'm going to comment on that very quickly because that's probably one of the most sensitive and delicate issues that the study group faced, was that we know from an infrastructure

standpoint, we know that the big challenge to putting infrastructure in is concern over climate change.

And the ambiguous nature of NEPA and some of the policies for permitting today allow the indirect impact of climate change to get into every single major permitting project. And so we really chose to not ignore that issue. We could have ignored the elephant in the room, but in reality, that really is the primary issue that causes opposition to infrastructure today, and so we address that, and you'll hear from Amy precisely how we addressed that, but I want to thank the Steering Committee and the whole study Committee for being supportive of the direction that we took on that.

I also want to -- I did get the chance to work with Secretary Brouillette as the Cochair for this, and I want to thank him as well. And then finally the leadership of the Coordinating Subcommittee, Amy Shank, Kristen Drew, Shawn Bennett from the DOE, Christopher Freitas, and Jim Slutz from the NPC all did a tremendous amount of effort to keep the study moving ahead with about 300 different study members.

The task groups were divided into four task groups, and you can see here Supply, Demand, and Resiliency was the first task group. Infrastructure

Mapping and Analysis was second. And that was a bit of a hot potato. That is a major undertaking, and thank goodness to both Exxon and Chevron for bringing the resources to pull that together because that is -- that was a massive undertaking of data and analysis.

And then finally the group that we referred to as PSSLO, which is the Permitting, Siting, and Social License to Operate group, and I will tell you that that group was the one that wrestled with a lot of the more difficult issues and the more sensitive issues around climate change and the permitting process around that. And then, finally, the Technology group that looked at a lot of really interesting technologies that could be brought to bear along with a lot of help from the DOE on that.

So I want to thank the leaders of these task groups. They did a tremendous job for us and fought through some pretty difficult decisions as we moved the study forward.

And now you can see why, this is the diversity of the study teams. You can see here about 300 members, and you can see less than half of those working in the oil and gas business directly, and so very wide variety of individuals. Most of the major oil and gas companies were certainly included in this,

a lot of state and federal government experts, as well as NGOs, all coming together to try to put something together that allows us to move jointly ahead rather than continue to have a very divided perspective on how we permit and install infrastructure that we all recognize is needed to move our great nation ahead.

So that brings me to the report structure, and you can see here it's pretty simple. This is centered around the four task groups that I just provided, a transmittal letter that will go to the Secretary as a cover to this document, a preface executive summary that's a pretty lengthy document by itself, and the body of the work, which I will tell you has a very large thud factor to it, but it is an amazing document. And if you take the time to distribute that around your organizations as that comes out, it's a tremendous reference document, a lot of great recommendations and findings in it, but as well there's some tremendous reference that's been pulled together in that document.

So with that, I just wanted to say a big thank-you and introduce this, and I'm going to introduce Amy Shank, who next time I come looking for somebody to take on a little special extra project, she's going to be running, but has done a fantastic job, and I really appreciate her leadership.

(Applause.)

MS. SHANK: Good morning. Wow, I can't tell you how glad I am to be here. I want to start off by thanking the NPC members and staff. Throughout this process, I've been extremely impressed by the enthusiasm and passion of Jim Slutz, John Guy, and Marshall Nichols. And I'm thankful for organizations like the NPC that exist for the sole purpose of collecting diverse viewpoints and providing perspective and advice to the Government.

I want to thank Alan for providing me this opportunity to lead this important study and express how honored I am to be the one up here that's communicating the work product of so many amazing people. I want to thank the DOE professionals -- many of them are sitting in the back of the room -- who sat on every level of the Committee, and they provided such amazing and valuable feedback and resources. We couldn't have done it without them. Of course, they all had to be there, so...

I want to say thank you to all of the companies and organizations who gave generously of their most valuable resource -- the time and talent of their people. I don't have time to thank everyone, and you're probably glad about that, but I do want to

acknowledge a few individuals before jumping into the presentation.

I want to start with Shawn Bennett, the Deputy Assistant Secretary for Oil and Natural Gas for the DOE. So Shawn was my Government Cochair on the Coordinating Subcommittee, and he was by my side for every meeting. During that time, I developed a tremendous respect for him, his knowledge, and experience, as well as his capacity to synthesize large amounts of information. I'm convinced Shawn read every word, all 630 pages, because he provided feedback on almost all of it.

I'd like to thank the individuals who chaired our four task groups and helped to coordinate the development of the executive summary, and I'm going to introduce them individually. I'm going to start with the Supply and Demand chapter that was chaired by Paul McNutt from Conoco and his Government Cochair, Ken Vincent.

Next is Infrastructure Resiliency, Mapping and Analysis that was led by Lydia Johnson and Brooke Harris from Exxon, along with Rich Cain from Chevron, and Doug Macintyre, who is their Government Cochair from the DOE.

The Permitting, Siting, and Social License to

Operate task group was led by Maria Dunn from Phillips66 and Mark Gebbia from Williams, along with their Government Cochair, Christopher Freitas.

And then there was the Technology Advancements and Deployment task group that was led by Jay Churchill and Doug Sauer from Phillips66, along with their Government Cochairs, Jared Ciferno and Eric Smistad from the National Energy Technology Laboratory at the DOE.

And then there was Tom Eizember, who's retired from Exxon, and you might recognize his name. He's worked on several of these studies, and he had the daunting task of authoring the executive summary.

And, finally, I want to acknowledge Kristen Drew from Williams. Kristen was my assistant on the study, but that title doesn't begin to describe the level of her contribution. Through Kristen's tireless efforts, immense dedication, and superb organization, she made sure all those hours spent in all of those windowless conference rooms were the most efficient and productive that they possibly could have been, all while contributing her own experiences and knowledge to the study. So for that and everything else that you did, Kristen, I want to say thank you.

So in May of this year, smack dab in the

middle of the study, I took a three-day weekend, and I went to Panama City Beach, Florida. I was facing a half-Iron-Man triathlon, which anybody who knows me will tell you is what I do when I'm not working. Now, normally, Panama City Beach is a beautiful place, and it's a great place for family vacations. You can build sand castles and drink little umbrella drinks for hours. It has sugar sand beaches and light ocean breezes and pretty mild temperatures, at least that's what the website said when I signed up.

But on this weekend, there were thunderstorms in the area, and at 6:00 a.m. on that Saturday morning, I found myself standing on the beach with about 2,000 other athletes facing five-foot waves, riptide warnings, high winds, and unseasonably high heat and humidity. And even as I faced those challenging conditions, I knew that not competing was not an option. I mean, I'd paid a ton to be there. I'd shipped my bike, so there was no doubt that the day was going to be difficult, but I trusted my training, and I knew that I wasn't in it alone.

The only way through it was forward. So when it came my turn to start the race, I scanned the crowd and found my husband. I gave him the thumbs-up, and I headed into the water. That experience reminds me of

the challenges that we faced on this study. We were charting a course for oil and gas infrastructure into the 21st Century. The conditions for permitting in several regions are very hard, and our future energy needs were hotly debated.

The pathway to reconciling these frictions appears to be difficult and sometimes even impossible, but those of us in the industry, our stakeholders, and our government partners are in this together. It's going to be a journey that we take one step at a time, and the only way through it is forward.

And just like how I started that day on Panama City Beach, facing the three intimidating elements of waves, winds, and heat, the study identified three overarching challenges. First, we must modernize the National Environmental Protection Act and its associated permitting processes. We must develop a national climate policy that considers today's social conscience. And we must draw on smarter policies, better technologies, and the intensive engagement with stakeholders that's needed to meet our nation's growing energy demands. And we have to do all of this while keeping our economy strong.

"Dynamic Delivery: America's Evolving Oil and Natural Gas Transportation Infrastructure," analyzed

multiple supply and demand scenarios. Can we go to the next slide?

So we analyzed multiple supply and demand scenarios which provided the foundation for our analysis and our recommendations. You won't be surprised, as Secretary Brouillette and Alan Armstrong both indicated, that the U.S. is now the largest producer of oil and natural gas in the world and that it's provided phenomenal and historic economic, environmental, and reliability benefits.

You might, however, find it surprising that at the same time that the U.S. was seeing this exponential growth in oil and gas development that our overall CO2 emissions decreased by 15 percent. Now, this is primarily due to natural gas replacing coal for electricity generation, but there's also the benefit of some technology advancements.

One of the most surprising findings, and the one that I use in the elevator speech that I give anytime anybody asks me what I've done for the last 18 months, is that no matter what scenario you choose, even the low-carbon, high-renewable scenario, America's need for oil will remain significant, and the demand for natural gas will continue to grow well into 2040.

There's no doubt that the shale revolution has

been huge. It wasn't that long ago, and I think we can all remember, when the prices at the pump were at all-time highs, and the industry was scrambling to build LNG import facilities. But then everything turned on a dime. Natural gas and gasoline prices plummeted, and the industry all of a sudden found themselves in a situation where they had to try and figure out how to turn all those import facilities into export facilities. And some of them hadn't even been commissioned yet.

If history has taught us anything it's that when it comes to oil and gas supply sources the only constant is change. Tomorrow's supply centers will most likely not be where they are today. American ingenuity will continue to surprise us. And while our existing oil and natural gas infrastructure is amazingly flexible and resilient, the study shows that it has flexed just about as much as it can.

More infrastructure will be needed if we're going to allow these benefits to continue. Connecting new supply and demand centers in the future will hinge on the industry's ability to secure significant public and private investment that's needed to expand pipelines, ports, rail, and inland waterways. When new infrastructure is delayed, bottlenecks form or worsen,

such as what we're already seeing today in New England, as well as in the Port of Houston, also in the form of export capacity limitations.

These bottlenecks result in regional pricing discrepancies, fuel shortages, and the missed opportunity for all U.S. citizens to benefit from the lowest possible energy alternatives. And even when we have adequate investment and projects that are already permitted and shovel-ready, the study found that we are currently experiencing skilled labor shortages, and those shortages will increase in the future, providing yet another challenge.

The value of our existing infrastructure is impressive. Oil and gas infrastructure accounts for 10.3 million jobs that provides $714 billion in income and $1.3 trillion in total economic benefit, along with billions and billions in tax revenue. This graph shows that as production has grown, the cost of utilities and ultimately the cost to customers has decreased.

And you can see here that the price impact of the shale boom has driven energy -- the energy costs of goods production down in almost every sector, anyway from 2 to 8 percent. But even with all the societal benefits that we highlight in the study, projects are being delayed and sometimes stopped entirely. And the

permitting process has become unnecessarily complicated.

In order to maximize infrastructure value, we must find a way to minimize the negative impacts on interstate commerce brought on by friction between federal and state interests and preferences. The NPC recommends that all levels of government should engage in constructive dialogue about the overall economic benefits from the nation's energy resources. And at the same time, industry must engage with stakeholders and work to minimize impacts and risks.

In order to maximize economic contribution of ports and inland waterways, the NPC recommends that Congress fully appropriate the revenue coming into the Harbor Maintenance Trust Fund and the Inland Waterway Trust Fund to restore and maintain all of our U.S. ports and waterways to their authorized dimensions and expand where needed.

To ensure a skilled workforce is ready and able to build and maintain the infrastructure that we need, the NPC recommends that the federal government, states, secondary schools, and industry work together to promote vocational career education and advocate for registered and accredited apprenticeship programs.

This graphic depicts one of the many supply

chains that we studied and illustrates that it takes many types of infrastructure working together to provide the resilient systems that we enjoy today. And I'll again use the example of the shale revolution to illustrate this point. Up to now, our flexible, resilient, interdependent infrastructure systems have combined with technology improvements to facilitate the development of the tight geologic formations that previously had been inaccessible, bringing tremendous benefits to consumers. And that need for flexible and resilient infrastructure is not going to go away.

Okay, so you can't read this chart. It's got lots of timelines and really tiny print, and we actually knew that that was going to be the case, and it was actually on purpose. So I'll give you a second to soak in the complexity. This chart represents what can be required in the permitting process for a linear project like a natural gas pipeline. And it's included in the study to highlight our ninth key finding that overlapping and duplicative regulatory requirements, inconsistencies across multiple federal and state agencies, and unnecessarily lengthy administrative procedures have created a complex and unpredictable permitting process. Exhibit A.

The Dynamic Delivery report includes several

recommendations to improve what I call the spaghetti mess, but the top three are first the need for better coordination between federal and state governments, and we recommend the use of a nonpartisan, non-for-profit association of state and territorial environmental agency leaders called the Environmental Council of States to facilitate a common agreement between federal and state Environmental Protection Act review.

Second, the NPC recommends the development of a master model structure for state permitting and coordinating permit approvals. Having 50 different permitting pathways is difficult to navigate, to say the least. And we must have better collaboration for our linear projects like pipelines and railroads.

It would be extremely helpful if states identified one single point of contact for permitting coordination between impacted state and federal agencies. Some states already do this, and it's shown to be beneficial to both the states and the project developers. Because the U.S. Army Corps of Engineers plays a key role in almost all infrastructure projects, we have four recommendations impacting them, and they're all designed to help a highly decentralized agency provide more consistency across their districts.

The recommendations are a bit technical, but

they generally involve identifying lead districts, implementing rulemaking to provide more consistency across those districts, the establishment of a single point of contact for each major project, and providing more certainty around when the Corps requires notice and comments on federal environmental laws before construction begins.

Now, we recognize that the Executive Branch and Congress have been working together to try and improve the permitting process for years. And the new One Federal Decision is something that we'd like to see continued, although it could be improved and then possibly codified. One Federal Decision is an Executive Order designed to reduce the environmental review time for major infrastructure projects to no more than two years. Congress passed the FAST-41 Act and created FPISC, which is an interagency permitting committee designed to help expedite projects.

The NPC finds that these bipartisan efforts present positive steps, but they could be improved through more effective consultation with industry and others regarding what's working and what's not. So the NPC recommends that Congress reauthorize FAST-41 for another seven years but with the following improvements. We recommend expanding it to include all

federal energy infrastructure projects. We'd like to see the inclusion of incentives for states to comply. FPISC should be utilized to get states to do their reviews concurrently with the federal reviews. And once the process has deemed to be working well, we'd like to see the sunset provision eliminated.

Another key to successful siting, construction, and long-term operations of oil and gas infrastructure is effective stakeholder engagement. The Permitting, Siting, and Social License to Operate Task Group held multiple listening sessions with various stakeholder groups and Indian tribes with the idea to identify current gaps and best practices.

As a result of these sessions and our research, the NPC recommends that infrastructure companies better utilize best practices for early and enduring engagement with all impacted stakeholders, all individuals, groups, and governments. Companies should provide education and increase awareness regarding the needs and benefit of infrastructure and how concerns are addressed through the safe design, construction, and operating practices. And they should work together to encourage the adoption of policies for responsible energy development. Our industry really does have a good story to tell, and we should do a better job of

telling it.

One particular set of stakeholders that have been increasingly active are the individuals and groups that connect the development of oil and gas infrastructure with the negative impacts on climate. The NPC recognizes the dual challenge of providing affordable energy while addressing the risks of climate change. And while we share the concern that climate change is a serious issue requiring action, we believe that fighting individual projects in the courts is an ineffective way to get the change that's needed.

The NPC recommends that all oil and gas infrastructure companies strive for outstanding environmental compliance records and continue to work to reduce emissions from their operations. We list several programs in the study that the industry can use to demonstrate and highlight their performance and progress in this space.

But good environmental stewardship should be a minimum expectation. We have to recognize that the voices about climate change are becoming stronger and have been successful in challenging, delaying, and sometimes even stopping infrastructure projects. The trend is expected to not only continue but to increase in intensity as long as litigating the permitting

process is seen as the only way to drive the policy debate.

If we truly want enduring improvement in our permitting processes, Congress should clarify that greenhouse gas assessments under NEPA for oil and gas infrastructure projects be confined to emissions that are proximately caused and reasonably foreseeable. And in parallel, Congress should enact a comprehensive national policy to reduce greenhouse gas emissions and seek to harmonize federal, state, and sectorial policies that enhance efficiency and effectiveness.

At this point, I'd like to talk about technology and its link to safe, environmentally conscious transportation operations. When Alan reviewed the study demographics, you might have noticed that over 100 individuals contributed to the technology advancements and deployment chapter. That's over twice the number of people who worked on any of the other chapters, and there's a good reason for that.

The oil and natural gas transportation industry continues to drive vast improvements through all transportation modes, including pipelines, rail, truck, and marine. So it took a lot of folks weighing in on the good things that are already happening and to help identify the best opportunities for future

development.

Through the hard work of those 126 people, we verified what we already knew, that oil and natural gas arrives at its destination with a high degree of safety, reliability, and environmental performance nearly 100 percent of the time. But incidents have happened, and we can do better. The oil and gas infrastructure companies are dedicated to continuous improvement and are working to find a path to zero.

The NPC found that advancements in new technology contribute greatly to the industry's safety, reliability, and environmental performance, and overcoming challenges and barriers to new technology development and deployment would help accelerate these improvements. The NPC makes several actionable recommendations focused on collaboration between federal agencies and in some cases industry. Four of those are highlighted in the executive summary.

First, the Department of Transportation should create a faster way for new technology to be adopted. The DOE, the EPA, and the U.S. Coast Guard can all be helpful in this process as well. Second, we should be more willing to test drive new technologies through pilot programs. Congress should authorize DOT with the support from industry to help develop these programs.

Performance rules should also be tested to allow more flexibility for companies to demonstrate that they are enhancing public safety through the application of new technology, especially in the area's pipelines, storage, and LNG facilities where the evidence already shows that this is the case.

Third, the NPC recommends the establishment of research consortiums to prioritize promising research opportunities, establish better technology readiness processes, and prioritize ways to field test new technologies. There is a role for oil and gas companies, along with the DOT, DOE, and the EPA, in this effort.

And, finally, FERC and state agencies should work together with DOT, DOE, and others to promote laws, regulations, and public-private partnerships that support cost recovery for oil and natural gas pipeline safety research.

As a part of our investigation into technology, the Secretary specifically asked us to evaluate the risk of cyber attacks on our oil and natural gas infrastructure. In doing that, we found that cyber threats to energy infrastructure control systems are increasing, and security protections are being challenged due to increasing connectivity and

growing malicious cyber activity.

To counter those risks, cybersecurity protection should be advanced in three ways. The industry, trade associations, and the Federal Government should work together to maintain up-to-date, performance-based cybersecurity management standards to be adopted by industry. These threats are evolving quickly, and we have to maintain up-to-date playbooks.

We recommend that the Departments of Homeland Security and Energy increase their capabilities and resources so that they can conduct independent, secure cybersecurity assessments and audits, prioritized on critical infrastructure.

And, third, we need better collaboration on the research and development agenda in the area of cyber threats. The DOE, working with industry, in concert with the Departments of Defense, Homeland Security, and Transportation, should establish a collaborative process and identify and prioritize research and development aimed at sector-wide protection against nation-state and advanced threat actors.

So in conclusion, when it comes to the status of our oil and natural gas infrastructure, I find that our nation is in a place not unlike where I found

myself on that beach back in May. The waves were huge, and the water was scary. Before I even started swimming, I saw people throwing in the towel and being brought back to shore. Once I got out there, I noticed several people were hanging onto buoys. They were unable to move forward or back. They were just waiting to be rescued.

And as I made the final turn at that big, red buoy and headed to shore, I paused to yell some words of encouragement to the people who were hanging on there. I tried to rally them because I knew that we could do it together. And on the way back in, I could feel the current as it was pushing me forward but then pulling me back. And there was a period of time -- it seemed like a really long time -- that I wasn't moving at all.

But I kept repeating the mantra in my head, just keep swimming. And eventually I started passing the smaller buoys again one by one, and before I knew it, I was crawling out of the water and climbing onto my bike to complete the race. I started the day with a daunting task in front of me and lots of uncertainty as to how it was going to go. I was aware that there were still plenty of challenges ahead, but after the swim, I knew I was making progress.

The oil and natural gas infrastructure industry is in a race of its own, and it's not going to be easy. It's going to be challenging to do what's right for the environment, the economy, and the American people, and it's a formidable balancing act, but this study provides the NPC's best advice on how to succeed in that endeavor.

Thank you so much for your attention and your interest.

(Applause.)

MR. ALAN ARMSTRONG: Okay, thank you, Amy, and I think I was the -- I think I was the inaccurate weather forecast in that story on Amy's part.

I'll just now open it up for discussion on any of the content from the members of the NPC and see if there's any desire to discuss that while we've got Amy and her team available to help out with that. So any discussion or questions on the study?

AUDIENCE: How do we change New York's climate?

MR. ALAN ARMSTRONG: Well, you know, Williams is at the forefront of that issue, and I would just say that I think it's very evident that there's a big opportunity in New York, both in terms of into New York City to reduce emissions in New York City and to

provide growing economy. So it really is one of the first times, frankly, that people are really starting to make the connection between a pipeline and that little blue flame and low-cost heat in their homes.

And so actually I think there's some real positives to come out of that because historically a lot of consumers have thought about pipelines as something, just a tool of the oil and gas industry, and they don't really connect it to them at the retail level and the consumer level. And so particular projects that are going on up there right now are really indications of that, and so I think the local real estate developers, the folks trying to develop the economy there in New York City, are getting very vocal on that issue, and I think that's exactly what we need to do to draw attention to the approvals for that. Thank you for that question.

Yes, Jim.

AUDIENCE: I'm wondering if the Committee looked at hydrogen at all, just with some of the growing discussion around injecting low levels of hydrogen into the existing gas pipeline network, how that might influence these recommendations.

MS. SHANK: So we didn't look at it all that much. I guess I would rely on our technology

advancements group to confirm that; however, I did hear it mentioned quite a bit in the CCUS study, so I'm going to punt that to our CCUS colleagues because you'll get a little bit of that in that study.

MR. ALAN ARMSTRONG: I can tell you that within the infrastructure companies that is certainly something that's on the horizon and something that's very interesting because it allows for congruence of concern over carbon and a low-carbon environment, along with excess renewable power when time for it's not needed, so it's a really powerful way of storing energy and certainly something that we as Williams are looking at.

Other questions?

(No response.)

MR. ALAN ARMSTRONG: Seeing none, Greg, we would like -- I'd like to move that we -- to the full Council and on behalf of the Committee that was formed for the study that we adopt the report subject to the final editing and approve making the study's topic papers available on the NPC website, and so I will make that motion and look for a second.

MR. GREG ARMSTRONG: Thank you, Alan and Amy, Kristen, Shawn, and all the many others that participated in the study and for the leadership just

in this important work. It's assembled what I think is truly a very -- as you can tell -- comprehensive report, many pages, many, many hours.

I have a motion that the NPC approve this report subject to final editing, approval of the transmittal letter to Secretary Brouillette, and to make this study's numerous topic papers available to the public through the NPC website. Can I have a second?

AUDIENCE (Off microphone): Second.

MR. GREG ARMSTRONG: We got a second. Are there any additional discussion?

(No response.)

MR. GREG ARMSTRONG: If not, we have a motion. I'd ask all those in favor please say aye.

(Chorus of ayes.)

MR. GREG ARMSTRONG: And any opposed say nay.

(No response.)

MR. GREG ARMSTRONG: With that, the motion carries and the report is adopted without objection, and thank you very, very much for that.

We'll now move on to our next report to be considered. It's from the NPC Committee on Carbon Capture, Use, and Storage. As with the Infrastructure study, many members of the Council provided their

significant leadership and personnel to prepare the response and, in fact, in the case of John, he extended his retirement, I think, about eight or nine months. I think he's going to celebrate today that retirement.

John Minge chairs this committee on CCUS, and he'll lead off the presentation as a result of their efforts. John, please. And I'm also glad that he's still talking to me.

MR. MINGE: Thanks, Greg, and a good morning, everybody. Okay, so great to be here. I'm going to talk about the carbon capture study that we've worked on over the last 18 months. So the title we came up with is Meeting the Dual Challenge: A Roadmap to At-Scale Deployment of Carbon Capture, Use, and Storage. The Secretary of Energy requested us to study and to define the potential pathways for integrating CCUS at scale into the energy and industrial marketplace.

The Secretary didn't define what "at scale" meant. And so we actually got to do that, and I'll tell you what that is. But he asked us to consider technology options, readiness; the market and the market dynamics, the economics and financing; cross-industry integration and infrastructure; the policy, legal, and regulatory issues and barriers that are out there; the environmental footprint, and public

acceptance. And we've done all that.

If you broke it down, there's really five key questions that the Secretary asked us to look at, and these are listed on the slide. So he wanted us to look at the energy demand and -- both energy demand and forecast but also the emissions forecast. And then what are the environmental benefits that come from the application of carbon capture, use, and storage. You know, what are the R&D, technology, infrastructure, and economic barriers that must be overcome to deploy CCUS at scale? How should success be defined? What are the actions that should be taken to establish a framework that guides public policy and drives investment from the private sector? And what are the regulatory, legal, liability, and other issues that need to be addressed?

You know, I said to other groups that when I read this letter over and over again, setting out the request from the Department of Energy, that as you read it as I read it, you could feel a sense of frustration that came from the Department of Energy. You know, after all, they had been studying this, investing in carbon capture, use, and storage for 20, 25 years.

And if you looked at the results, the U.S. is clearly a leader. The U.S. -- and Cindy will cover

this -- there's all kinds of reasons that we can be hugely proud of the success that we've had in the United States of America with carbon capture. And it's primarily, though, the only value chain that really works is CO2 to EOR. And if you look at the scale, it's pretty small: 25 million tonnes per annum.

And for those of you that don't know all the numbers, if you look at the world's -- the global emissions that come from fossil fuels and industry, it's about 36.8 billion tonnes of CO2 per year. The U.S. portion of that is about 5.3 billion. And so if you look at how -- you know, the amount of emissions that are stored or abated through carbon capture today after 25 years of work, it's 25 million, so less than a half of a percent of the yearly emissions, so pretty small scale.

The other thing, you know, as I came in, I was no expert. No expert at carbon capture, use, and storage. I could spell it. I knew of it. I knew a little bit about it, but not very much. And so one of the first things you do is you -- I did is start reading the reports. And I read a lot of reports, and they are thick, and many of them are boring. And many of them are reports that I found myself wanting to understand more. I wanted to understand the what, the

why, how, the detail.

And I found myself a bit frustrated. And there are many, many of them, and I read a lot. And I came away looking at, from the DOE perspective, you got a stack of reports like this, but there's only 19 projects in the whole world that are at scale. Ten of those are in the United States, 25 million tonnes per annum. And it's kind of that old adage of, you know, big hat, no cows.

So our job was to figure out what we needed to do for wide-scale deployment and to grow this and to actually put together a plan. So we have -- the group that came together have written a comprehensive report. I believe it's the most comprehensive report ever written on this subject, and many other people who have worked on this believe the same way.

It covers these five areas. It provides the energy and emissions landscape. It goes through a detailed cost analysis and provides economics on CCUS across all of the industrial sectors. It really dives into the enabling factors and what is existing policy today versus what needs to come. It goes into the technology. We covered it in five areas: capture, transport, storage, we had a separate section on EOR, and use. Very well written.

And, finally, the Secretary asked us to pull all this together into a roadmap, into a plan that would actually drive wide-scale deployment of CCUS. We defined wide-scale deployment of CCUS at about 500 million tonnes per annum, so 20 times what we have today. If -- which is about 10 percent of the U.S. current emissions. And we came at it different ways, but one of the -- one of the things that I was interested in is to see the most recent IEA study that just came out a couple weeks ago. And within that study, they have a lot of different scenarios, but one of their scenarios is a sustainable development case. And within that case, there's a number of wedges: efficiency, renewables, nuclear, but when you get down -- and then they have a wedge for carbon capture, use, and storage. And the wedge out to 2050 is 9 percent. Well, 9 percent of 5 billion would be 450 million tonnes per annum in America. We're coming up with 500, so it's in the game, and it's close.

When you look at that, and I'm going to -- I have a bullet point on this later, but most people -- in fact, most people in our study, if you said 500 million tonnes per annum, yeah, do you know what that means in terms of the amount of infrastructure, and most people don't. Well, that is 13 million barrels a

day of capacity, okay? And we have in our production in the United States of America today is about 12 and a half, growing to 13 million, so we are talking about infrastructure requirements that equal the amount of production that we have in the United States. It's huge. So it is a big, big opportunity. It's a big, big challenge.

Now, one of the things the Steering Committee, when we got together early on, they gave me some really good guidance. They said we're not going to write a report on climate. That's not what we've been asked to do. We're going to talk -- but we, as an industry, respond to markets. And markets are driving demand for lower carbon products. They are driving demand for lower emissions, but we all recognize that the world's energy demand is going up, going up 25 to 30 percent over the next 20 years, and it's going up because of population growth and people are moving out of poverty into the middle class.

At the same time, there's more and more demand for lower emissions to combat the risk of climate change. And so that's the dual challenge, and we kind of center the rationale and the emissions and energy landscape around the dual challenge and the fact that markets are driving consumer behavior. Governments are

taking action, and we in the United States of America are blessed in so many ways, and we have a real opportunity to be -- to not only -- to build on our leadership position that we have today.

On the economic side, Cindy's going to cover this in detail, but we spent weeks, if not months, doing very, very detailed work on the costs of carbon capture, use, and storage. Why? It's the biggest -- the economics are the fundamental biggest reason we don't have very many cows, okay? So it's because people can't make money based on the incentives that are available, but also the barriers that exist within the regulatory front or on the legal side and whatnot. And so really understanding the fundamental economics was absolutely central to what we have done, and the team have done a tremendous job of that at pulling together, looking, and doing detailed work using a cash flow model to actually -- to determine what incentives are going to be needed to drive investment.

The enabling factors, you know, beyond the executive summary, read Chapter 3. It will -- it does go to the what, the why, the how, the who, and by when. It is a -- you know, and we set ourselves that standard that we really want to explain to policymakers the rationale, the reasoning, so that when we get into a

debate we actually have real meat to be able to talk to, and it just doesn't go over people's heads. And I think that -- the team have done a tremendous job there.

On technology, we wanted one place where we could cover -- where people could go that wanted to learn, that could read some well-written chapters on each of the technology, the five areas that I talked about later, but then we also really say that we have to have more investment in technology to drive the costs down out into the future. That's the key purpose. And Cindy will also cover that, but we're recommended a tripling of the budget that goes into R&D to drive those costs down out into the future.

Finally, we have pulled all of this together and put it into a roadmap. We have a prioritized plan that has three phases that goes from zero or from where we are today to 500 million tonnes per annum. It's over -- from today for 25 years. And it lays out in detail across the financial side, the regulatory side, the legal side, but also public support and all those four areas in a lot of detail.

You know, we believe it's the most comprehensive report written, and we believe that it will be used for years and can be used, regardless of

political parties in the White House or within the Department. We think this is good for all seasons and will be a toolkit that can be used for many years.

So how did we organize? Much like Alan. And I just -- I don't have a slide listing everybody's name, but you can see the same structure with the Study Committee, the Steering Committee, the Coordinating Subcommittee that Cindy led, where the bulk of the work gets done, and then you see those five groups below.

I just do want to recognize, though, the Steering Committee who gave me a ton of work. Christi Craddick, I saw her last night, but I haven't seen her this morning. There's Christi. Jack Futcher from Bechtel. I didn't see Jack. Joe Gorder, Valero. Kim Greene from Southern. Yep, good to see you.

Vicki, I don't know if Vicki made it, Vicki Hollub? Yep. Paal Kibsgaard. I know J.F. is sitting in for Paal. Richard Newell. Where's Richard? You were here last night. There you are, Richard. You're supposed to be sitting up front. Gretchen Watkins. I haven't seen Gretchen yet today. And then Darren Woods right up front. So thank you, guys. We couldn't have done it, I couldn't have done it without you, our team. Cindy and the team couldn't have, the steer that you gave was fantastic.

Much like the other study, our -- we had -- this was all pulled together with a hugely diverse group of people. And only about a third of the people that worked on this study came from oil and gas. And we held everybody together. Nobody walked. The environmental NGOs didn't walk; academia didn't walk.

We didn't agree on everything. We did not agree on everything, but we agreed on most things. And places that were tough, we didn't punt the ball down the field, give up on it, put some high-level, wishy-washy thing that no one could understand. We actually dealt with it and tried to determine what we could agree on. And in most cases, we really moved the ball down the field, and I'm real proud of the team for doing that.

And we also -- the request of the Secretary was for us to engage the National Coal Council, and we did that. And we had good overlap within our team, within Cindy's team, because we had over 300 people that were participating from 110 different companies, but we had a lot of overlap with companies that are also on the National Coal Council.

So if I were to -- I decided, okay, what's a summary of this, and what would it mean if we were able to deploy CCUS at the scale that we're talking about,

the plan? What would happen if we could actually deliver this plan, this roadmap? Well, we'd be moving from 25 to 500 million tonnes per annum. Our infrastructure build-out would be equivalent to 13 million barrels a day. We'd have an incremental investment of $680 billion. And we would have created 236,000 jobs and added $21 billion a year to GDP. That seems like a lot of cows to me, and that would be small hat, big cows, I would say.

Anyway, what's it going to require? It's going to improve policies. What we have today won't cut it. It's why people haven't been investing. It's very clear, and we lay that out. We're going to need to have increased financial incentives, and Cindy will go through that and walk through the cost curve and give you the reason why.

Regulations are going to need to be simplified, and barriers are going to have to be broken down, and we're going to have to have both with the agencies doing some work, but also legislation, Congress. We're going to need broad-based innovation and technology development, really targeted at driving down the cost out in the long-term future. That's going to be needed.

We're going to have to have strong

collaboration between the industry and government. And, finally, we're going to have to -- out in the public, we're going to need to build more support and more understanding and confidence that CCUS is a safe and reliable method and manner to go forward to meet the dual challenge.

So with that, I'm going to hand over to Cindy. Cindy, you and your team have done an amazing job, and I look forward to hearing the findings and recommendations.

(Applause.)

MS. YEILDING: Thank you, John. Next, on behalf of the over 300 participants of the NPC CCUS team, we'd like to share an overview of the context, findings, and recommendations of this report. So John and Amy both teed up the dual challenge, but we just wanted to remind you that we're facing this fundamental dilemma as a society, which we refer to as the dual challenge, with every indicator pointing to a growing global population, and expansion of relative prosperity worldwide, the demand for energy is on an upward trajectory. It's also clear that carbon dioxide, or CO2, emissions are on the rise.

The dual challenge of providing more energy to support growing populations while reducing greenhouse

gas emissions is one of the fundamental challenges society is facing today. So we also, as context, wanted to share an understanding of the value of the carbon capture, use, and storage value chain requires understanding of the CCUS supply chain, where we engage a broad spectrum of technologies to create a carbon management system.

CCUS is a process that begins with capturing CO2 emissions from industrial sources or directly from the air. The CO2 can be converted directly -- the CO2 is transported and then can be converted into useful products at a very small scale. Or, much more often, the carbon dioxide is compressed and transported to be injected underground, where it is safely and permanently stored.

There are many potential ways to link the building blocks of the CCUS supply chain. Some technologies are mature, and many require further development.

And one more piece of context, here's the diagram that John was talking about, but while carbon capture, use, and storage is not the only answer, we hope to demonstrate through this report that it can play a critical part of an "all of the above" solution in any attempt to address emissions reduction, and CCUS

should be a critical part of the U.S.'s strategy.

In addition, CCUS technologies under research and development today offer the best potential approaches to a negative emissions scenario, which may be required to remove CO2 directly from the atmosphere.

Okay. So one of the differentiators that John described in the study, and he also pointed out where we spent a huge amount of time, was the cost assessment. So this is one of the most ambitious aspects of the report, was undertaking an economic cost assessment conducted through a thorough, bottoms-up analysis of CCUS costs across the largest stationary sources of carbon emissions in the U.S. This analysis was generated using costs for proven technologies, amine-based capture, pipeline transport, enhanced oil recovery or saline storage. Costs were developed using expertise from a broad range of specialists.

Our analysis provides the value of financial incentives and the business case needed to enable deployment, the case for research development and demonstration (RD&D) that can lead to a reduction in cost and economic impact analysis of these investments and the direct impacts on jobs, gross domestic product, income, and tax revenues.

So we've done a lot of work. We wanted to

point out, you'll see numbers on the next slide, but we are also going to make many -- several of our tools available online through the NPC website. So if you'd like to rerun some of the cost models with different numbers, with different assumptions, we'll make that available to you. One of the key tenets of our project was show our work, show people how we came up with these costs, and if you would do them differently for a specific project, you'll be able to do that using this tool.

So the next two slides illustrate the approach and the output of this cost work. This curve's an illustration of the results of the cost modeling we just described, and we'll quickly walk through this to help orient you to the approach and to the outcomes. First, the elements of the work. The X axis depicts the annual volume of CO2 emitted from stationary sources in the U.S. We used 2018 and a million tonnes. This is a snapshot of the cost for deployed today. Using data from the EPA and the EIA, we focused our analysis on CO2 generated from the top 850 stationary emission sources. This represents about 80 percent of the U.S. emitters -- stationary emitters.

These point sources include CO2 from ethanol, powerplants, cement, chemical -- petrochemical, steel,

natural gas processing fertilizers, and others. The X axis is not a timeline but represents the cumulative emissions of about 2 billion tonnes of CO2 from these top 80 percent of source emitters.

The Y axis is the cost per tonne to capture, transport, and store for each of these point sources in the model. The cost per tonne gives an indication of the minimum financial revenue or benefit needed to incentive project development. The curve is arranged by lowest-cost to highest-cost projects. So, here, we show three illustrative examples of the 850 point sources that we modeled -- one for ethanol, one for cement, and one for natural gas processing. In these three examples, the lighter color indicates the cost for capturing the CO2 emissions, and the darker color indicates the combined cost for transport and storage or transport and use.

In our model, we made the following assumptions -- a 20-year asset life, a rate of return of 12 percent, 100 percent equity financing, 2.5 percent inflation rate, and 21 percent federal tax rate. While each point source was modeled using the methodology previously described, the actual cost of any specific project may be different, as each project has unique attributes that could cause it to be higher

or lower than the cost displayed in this model. But what we really wanted to do is add a big broad portfolio base, give you a sense of what the emissions -- addressing emissions in the U.S. could look like.

Another item we'd like to call your attention to are the downward arrows on this curve. These represent notional cost improvements resulting from RD&D investments.

So here's our cost curve again. And as previously referenced, the study envisions three phases of deployment: activation, getting started; expansion; and at-scale deployment. The first, activation, is represented by a dark blue segment on this chart. This gives us a jumpstart by clarifying existing federal tax policies and regulations. The middle range, the expansion phase, is built upon congressional actions and regulatory agencies' enhancement or expansion of existing policies.

And the lighter blue section on this curve, which as John described earlier, takes us to at-scale, the at-scale phase, would require additional financial incentives and policy support to continue investment towards the 500 million tonnes per year of CO2 abatement. This level of deployment is estimated to occur over a 25-year time frame.

And as previously noted, this analysis uses proven technologies with known costs. As noted by the yellow arrows, successful results from the proposed RD&D initiatives could reduce the policy source support required in this phase. And in this model, we estimate that 10, maybe up to 30, percent reduction in cost could be achieved through RD&D. These cost improvements could be greater or smaller, but we look to RD&D and learning by doing to unlock the full potential of these technologies out in the future.

So now we want to tell you our story. You're all familiar with the NPC process of crafting findings and supporting recommendations as an executive summary. While we're not writing a novel, we want to assure you that our findings tell a comprehensive story and we'll run through those now. We have ten of them.

Our first four findings frame the case for building CCUS at scale in the U.S. The report highlights the dual challenge and the fact that addressing this cost-effectively requires CCUS. Beyond a benefit to reducing emissions, this report identifies increasing deployment of CCUS as an economic benefit to the nation, creating new market opportunities, jobs, and capabilities.

Indeed, we're already the world leader

with about 80 percent of the world's current CCUS capacity -- 25 million tonnes per year -- and around 85 percent of the global CO2 pipeline, about 5,000 miles of CO2 pipeline infrastructure.

Our RD&D is already well under way with a significant investment through the Department of Energy of about $4.5 billion over the last 20 years. We have the beginnings of a meaningful public policy, infrastructure, although admittedly, it's not sufficient yet to drive wide-scale deployment.

Our next finding is that sort of beginning phase on the cost analysis that we showed earlier, and we described using the cost curve. The report is underpinned by a three-phased approach, and it starts with what we call the activation phase. This phase is focused on actions from federal agencies. For example, the IRS and the U.S. Treasury can focus on clarifying existing policy and regulations. The EPA can work to enhance and strengthen the Class VI well permitting process. And the Department of Interior and individual states should clarify rules of pore space access and ownership.

This will take away one big obstacle: uncertainty. And these actions could help double the U.S.'s CCUS capacity over the next five to seven years,

driving us to about 60 million tonnes of CO2 captured and stored per year.

The map on this slide portrays industry in its infancy with local CO2 emissions sources being delivered to nearby subsurface storage sites, primarily through enhanced oil recovery. During the activation phase, a total of about 50 billion in CCUS investments is estimated. These investments and multiplier effects are estimated to support about 9,000 jobs annually and $1.4 billion in annual GDP. The activation phase expands the baseline and should also increase public support, enabling us to move on to what we call the expansion phase.

Recommendations underpinning the expansion phase will require Congress and regulatory agencies to expand and to extend existing policies and strengthen the legal and regulatory framework for CCUS projects in the U.S. Recommendations underpinning this finding include expanding the use of tax credits and financial tools for CCUS projects.

There are also recommendations to fund improvements in well permitting processes, as well as additional regulatory reform at the federal and the state levels focused on poor space ownership, long-term liabilities, and infrastructure development. These

actions could result in yet another doubling of CCUS capacity within the next 15 years to a cumulative capacity of about 150 million tonnes of CO2 per year.

The map on this slide portrays the potential expansion of CCUS sources and sinks that could be enabled across the U.S., and we see more CO2 being transported to subsurface storage, as well as EOR.

During the expansion phase, an incremental $124 billion in investments is estimated, totaling about 175 billion. This level of investment will support over 42,000 annual jobs and 1.4 billion in annual GDP.

Phase 3, at-scale deployment, in our view, is 25 years away, but it’s achievable with further increased support driven by federal policy. Using proven technologies and today’s costs with operational improvements, we foresee the need for a mix of financial incentives to help enable this phase, amounting to about $90 to $110 a tonne of CO2.

Our map demonstrates the broad ranges of sources and sinks connected by a pipeline distribution system that grows across the Continental United States, illustrative of the at-scale deployment of the CCUS supply chain. During the at-scale phase, total investments will reach $680 billion. The annual

economic impact from this level of investment supports over 230,000 jobs and results in almost $21 billion in annual GDP.

A point that's really critical to make here is just because the results are phased out over 20, 25 years doesn't mean the work should be deferred. Because of the complexity of many of these solutions, we feel like the work underpinning activity in all three of these phases should begin now.

Our next finding is the critical role of RD&D investment. A commitment to CCUS must include an ongoing investment to research, development, and demonstration. The study described how CCUS technologies have been developed and builds the case for continued investments in that development. There have been tremendous strides in CCUS technologies over the last two decades, driven by public-private research, development, and demonstration partnerships.

Today, technologies across the supply chain vary in maturity. More mature technologies, like absorption and capture via amine scrubbing are well understood and have been in use for decades. The good news, we have a lot of experience with aiming and capture and know how to do it. However, there's unlikely to be significant improvements in cost just

from enabling more RD&D just for this technology. But if we focus RD&D on less mature, emerging technologies, the potential for breakthrough is much greater. A step change could decrease costs and lower the investment needed to unlock the benefits of at-scale deployment.

RD&D could be a real game changer here in the long term. If the investment delivers at the 30 percent target level we illustrated on the cost assessment, it would achieve a ten times return on investment or about 150 billion in cost savings over the at-scale development cycle.

So here's our Finding 8 and recommendations. So just as we've seen through a similar commitment to renewables research, additional RD&D will lead to further innovation, performance improvement, and cost reductions over time. That's why our report calls for $15 billion of government-funded RD&D over the next ten years to support fundamental research, pilot programs, and demonstration projects with a focus on emerging technologies.

Industry will also continue to partner with government, investing significant resources of its own to further research and development. Okay, to be clear, none of this, with the possible exception of Phase 1, can be accomplished without public

understanding, public confidence, and public support. This recommendation -- this report recommends an engagement approach aimed at informing the public and securing that support.

And our final finding is that we believe the oil and gas industry has a huge amount to offer in ensuring that U.S. -- continued U.S. leadership in CCUS deployment. The sector has experience in designing and deploying major projects -- the major projects required to execute at-scale deployment, a deep knowledge of full value chain integrated systems, and experience in developing and deploying new technologies, and a safety culture that should enable us to move forward.

So just to kind of summarize the key messages of the report, the U.S. is the world leader and is uniquely positioned to deploy CCUS at scale. CCUS can be deployed today; however, the economics of CCUS are challenging. Deployment at scale requires clarity, stable and enduring policy, and regulations and incentivization to catalyze development. Investment in research, development, and demonstration will continue further applications and help us drive down cost.

Finally, these actions can stimulate new industry in the U.S., creating jobs, capability, and economic growth for both the U.S. and a global

marketplace.

So the next four slides offer a romp through the report content and construct. We hope you'll review the entire report, and this slide will give you -- these slides will give you a sense of how it's organized. The report is very, very content-rich, but the findings and recommendations can all be found in the executive summary. And as John noted earlier, at the highest level, the core elements of the report are captured on the two-page roadmap to deployment in the executive summary.

The report has three parts: the executive summary; Volume 1, covering the aspects of growing to at-scale deployment; and Volume 2, covering the current state and future opportunities for CCUS technologies. Volume 1 highlights the energy and emissions landscape; economics; policy, regulatory, legal enablers; stakeholder engagement; and provides much detail, as I said, on the underpinning cost estimates and economics.

Volume 2 describes the technologies of the CCUS value chain, capture, transport, geologic storage, EOR, and use. And it also offers the case for future investments in RD&D.

So we know you're all eager to dig into the rich content, and we're thrilled to report that the

report website will be active in about an hour, depending on the outcome of this discussion, and hopefully you'll all be able to download the content soon. The hard copy report and executive summary will be in the first quarter of 2020.

Pending your endorsement of the study, the CCUS team will be sharing the results with key stakeholders throughout 2020, and if you would like a further presentation, please contact the NPC.

And just a final slide. This report had over 300 authors. It might sound like too many cooks in the kitchen, but in this case, we benefitted greatly from the broad ranges of experience and perspectives on CCUS. The at-scale deployment of carbon capture, use, and storage in the U.S. is intriguing, and potentially highly beneficial endeavor, not only in a -- not only from a policy and a business perspective but also from a society that is demanding a lower carbon future. It's highly complex, and we could not have designed the roadmap without all of these people.

We'd like to close by acknowledging every single one of them for their patience, their support, and their enthusiasm through this projects. So I'd just like to do a brief shout-out for those of you who were involved in the report construction, please raise

your hands. Just let the room acknowledge you, and that includes Steve Winberg, my Government Cochair, so thank you very much.

(Applause.)

MS. YEILDING: So with that, I'll turn the floor back over to John Minge.

MR. MINGE: Okay, thanks, Cindy. That was excellent. So in the same way that Alan did, I open up the floor to any questions or comments on this study.

(No response.)

MR. MINGE: All right. I've always been taught don't hesitate in this moment. Okay, so hearing none, I think the -- so on behalf of the Study Committee, Greg, I will move on behalf of the Committee that the Council adopt the report subject to final editing and approve making the study topic papers available on the NPC website.

MR. GREG ARMSTRONG: So, again, thanks to John and Cindy and the entire study group. So I have a motion that the NPC approve the report subject to final editing, approve the transmittal letter to Secretary Brouillette, and approve providing the topic papers and the cost curve model to the public through the NPC website. Can I get a second?

AUDIENCE: Second.

MR. GREG ARMSTRONG: Thank you. Are there any additional comments or questions?

(No response.)

MR. GREG ARMSTRONG: If not, would all those please in favor please say aye.

(Chorus of ayes.)

MR. GREG ARMSTRONG: Any opposed?

(No response.)

MR. GREG ARMSTRONG: So the motion carries and the study is approved without objection. So I want to thank the Committee again, everybody for all the work -- the amount of work that went into this was just unbelievable.

So, next, we have the opportunity and the honor to hear from Assistant Secretary of Fossil Energy, Steve Winberg. Steve is the Secretary's designated official for NPC matters, and we're particularly grateful to you for your cooperation and support throughout this entire study process, which was pretty amazing. If you were in one study group, you went to a lot. If you were in both study groups, you went to a heck of a lot. And so I'd invite you with the opportunity to make some comments.

ASSISTANT SECRETARY WINBERG: I'm vertically challenged, so I get to come up on this step.

Thank you, Greg. I want to thank everyone that's here today, with us today, and especially thank the National Petroleum Council. You were all instrumental in developing these significant and valuable reports. This has been a long process, but we wouldn't be here today without the contributions, the commitment, and, quite frankly, the plain hard work. I had the opportunity to sit in on a number of the sausage-making meetings, and here's what I observed. You get a bunch of Type A people in a room with a lot of varying ideas, and one of two things happen. Either sparks fly and people go off and nothing happens, or people buckle down and work together.

John made reference to that about the differing opinions, and I saw that. I saw it firsthand in a number of these meetings. And because of that, because of people's willingness to sit down and work through their differences, we have two very rich and robust reports. And for that, I think you. This is going to greatly help the Department of Energy and other agencies in the federal government as we move forward because they lay out the pathway to improve the nation's oil and gas transportation infrastructure and to deploy commercial CCUS technologies at scale in the U.S. energy and industrial marketplace, but also these

studies are going to help not only here in the U.S. but around the world as well. And they do represent a call to action for industry, Congress, and federal agencies.

Many of the recommendations in the reports align with the Department of Energy's mission and our research and development priorities, and they will inform our ongoing work. So I'd like to discuss for a few minutes on areas where the Department is uniquely suited to contribute to achieving these reports' objectives. And let me start with infrastructure. The Infrastructure study provides insights on the challenges to infrastructure development and highlights the importance of strengthening the nation's oil and gas infrastructure to provide reliable and affordable energy to consumers. This aligns well with the Administration's energy goals and DOE's priorities.

I'll start with the midstream technology R&D. We're developing tools and technologies to reduce losses in natural gas delivery infrastructure, to enhance operational efficiency of natural gas supply and delivery infrastructure, and to improve pipeline integrity. We've also been focusing on risks associated with crude by rail. And, finally, we're looking at the development of field technology testing centers to evaluate the innovative technologies to

detect, to accurately locate, and then measure the methane emissions associated with the natural gas supply and delivery system.

Moving on to integrated analysis. In response to the President's Executive Order on promoting energy infrastructure and energy growth, the Department of Energy and other federal agencies have been examining economic and other effects associated with infrastructure roadblocks in different regions of the U.S., including the Northeast and the West Coast. And DOE will continue to provide analysis on topics relating to energy infrastructure.

When we get to LNG permitting, DOE plays a crucial role in regulatory approval of LNG exports. Today, DOE has authorized the export of more than 38 billion cubic feet per day of natural gas, primarily spread across 15 large-scale projects in Louisiana, Texas, Maryland, Georgia, Mississippi, and the broader Gulf of Mexico. Five large-scale LNG terminals are already exporting with one more expected to have its first export any day now.

Currently, the U.S. has capacity for 7 billion cubic feet per day of LNG capacity that's online. By the end of 2020, we will -- we estimate that that will be at 10 billion cubic feet. And we have about 14

billion cubic feet either online or under construction. So from where we are today, we will be doubling LNG export capabilities over the next several years.

Ladies and gentlemen, that's pretty remarkable.

Last year, we issued a rule to expedite the permitting of small-scale exports of natural gas, including LNG. And DOE will continue to work to streamline this regulatory process.

Moving on to government and industry collaboration, DOE coordinates with the Department of Transportation, particularly with PHMSA, on pipeline reliability and natural gas storage facility operations, and we hope to expand our research collaboration with FEMSA over the next year. As the sector-specific agency for cybersecurity in the energy sector, DOE's Office of Cybersecurity, Energy Security, and Emergency Response, otherwise known as CESER, is focusing on improving the understanding of risks and mitigating them, clarifying industry and government roles and building capacity and information-sharing to better secure U.S. energy infrastructure. Ensuring energy infrastructure requires consistent industry-government collaboration. That is not going to go away; it's only going to become much more needed as we

move forward in time.

So moving on to the CCUS study, a number of the recommendations in that report can help drive DOE's research program agenda and enhance DOE contributions to interagency coordination and collaboration with our many stakeholders. Specifically, DOE has a role to play here in four critical areas. And I'll start with science and technology. DOE's carbon storage R&D program has significantly advanced the global CCUS knowledge base with a diverse portfolio of applied research programs. And our broader CCUS program has successfully deployed various large-scale CCUS pilot and demonstration projects, and we continue to build upon those significant achievements so that we can test, mature, and improve CCUS technologies at the commercial scale.

Most recently, we announced approximately $110 million in federal funding for cost-shared CCUS R&D projects, and the goal that we have in place at the Department of Energy is to reduce the capture cost by 50 percent, notionally down to about $30 per metric tonne of CO2. That will be the capture cost. When we get to that point, and I am confident that we will, I believe it can become cost-effective, business can take over on the CCUS, and the government can get out of the

way and let business do what it does best, and that is to innovate.

Let me move on to interagency coordination. I've been in DC now for two years, and it's pretty apparent to me that traffic gridlock and congressional gridlock happens all the time. What I've also seen is that in the regulatory space there's no such gridlock. And when it comes to writing excruciatingly complicated regulations, this town excels. Amy Shank's very colorful diagram, I think, is an indicator of the ability of this town to excel.

So DOE is working closely with federal agencies to try and coordinate all aspects of this regulatory effort that's going to take place, primarily in CCUS, but also in the transportation piece of this NPC effort. And so my goal is try and work with our sister agencies to try and uncomplicate things as much as we can possibly can. We're never going to completely uncomplicate things, but to the extent we can, I will tell you that that is what my goal is, and more specifically, we are working with the Treasury Department on the IRS regulations for 45Q.

I can't promise that they're not going to be complicated. I can't speak on behalf of Treasury, but what I can tell you is that we are working with them on

a very regular basis. We are hearing what you tell us. We get a lot of people coming and talking to us about 45Q. We're listening, and we're talking to the IRS, and I hope that you are as well because we need to get these regulations in place so that we can actually go about the business of commercializing CCUS.

And, finally, stakeholder -- engaging state governments and stakeholders. DOE has a pretty long history of collaboration and productive working relationships with states on CCUS. We work directly with state governments and through state-led initiatives such as the State Carbon Capture Working Group, the Southern States Energy Board, the National Association of State Energy Officials. These state-based efforts have complemented R&D efforts such as the Regional Carbon Sequestration Partnership and will continue to enhance new programs such as Carbon Safe.

So the NPC reports being announced today provide clear roadmaps to meeting two critical U.S. energy challenges, and the study recommendations dovetail with and will inform the Department of Energy's ongoing efforts to improve and strengthen our oil and gas infrastructure and commercially deploy CCUS technologies. We're committed to continuing that work, and we look forward to collaborating with the NPC and

with Congress, our partners, and stakeholders at every level as we go forward.

So, again, thank you all for being here today, and thanks again to the NPC for developing these important reports.

(Applause.)

MR. GREG ARMSTRONG: So thanks, Steve, for sharing those remarks, and we trust that you and others in the national, state, and local governments will find the assembled data analyses inside and recommendations useful in addressing the difficult balance among environmental, economic, and energy security goals. And we look forward to sharing the results with the public.

So we'll move on to administrative matters. Before I address those, I have two announcements. First is that our webcast will now conclude. For those in the online audience, we thank you for watching our proceedings this morning and encourage you to download and read the final reports, which will be posted at www.npc.org following the adjournment of this meeting. We'll wait just a minute while they go ahead and disconnect.

Second, for the members of the media here today, ten minutes following the meeting's adjournment,

the study leaders and I will be available at the head table here to respond to your questions regarding the reports for today's meeting for a short press conference there. And we'll now turn to administrative matters.

Our first administrative matter this morning is the report of the Finance Committee. Byron Dunn, Chair of the Finance Committee, will present the Committee's report.

MR. DUNN: Thank you, Mr. Chairman. In addition to reviewing periodic performance throughout the year, the Finance Committee has met twice to discuss Council finances, once in August and then again yesterday afternoon. Our August meeting included a review of the calendar year 2018 draft audit report and the IRS Form 990 with Johnson & Lambert, who is our outside auditor. You'd be pleased to know that Johnson & Lambert provided the Council with a clean opinion. I think that validates that our financial controls are sound.

Yesterday afternoon, the Finance Committee covered a variety of topics, including the 2019 year-to-date and projected year-end expenditures and contribution collections. The Council anticipates 2019 spending will be right at or just under the budget

amount of $5.8 million, which includes the substantial expense to support both studies that you heard today, and the completion of the Arctic supplemental assessment report that trailed from the previous year. Contribution collections are currently anticipated to exceed 90 percent of expectations from the budget but with an opportunity to go a little bit higher since we've got a few more days left in this year.

Now, look, some of you -- most all of you -- paid. Some of you haven't, and kind of 'tis the season, so you still have time to clear your conscience.

In addition, the Committee discussed and agreed upon a significant reduction for the proposed 2020 budget in the amount of $5.168 million. This budget supports the Council's ongoing operations and provides the resources needed to finalize and then publish the infrastructure and the CCUs studies. The proposed 2020 budget represents 11 percent decrease compared to the 2019 budget. And I would say that that 5.168 budget assumes the contributions request of the same amount from this year.

The proposed 2020 budget represents that 11 percent reduction, and the proposed '20 budget also continues to set aside funds for the post-retirement

health liability, although on a smaller amount from previous years. Both the Finance Committee and the National Petroleum Council management recognizes the challenges that the Council Members face in the near term, and our industry's going through a little bit -- a time of uncertainty, and accordingly, the NPC management, I think, has done a great job and worked diligently to scrutinize the Council's budget, line item by line item, to minimize costs wherever possible.

Management is being proactively frugal while being responsible to the Council's continuing mission. I believe the budget has reflected those important efforts.

Now, subject to your approval, the budget and contribution recommendations the Council will send individual statements out in 2020, early in the year. And I encourage you, because we all seem to procrastinate, we'd like to get those in as early in the year as possible.

And for those of you yet to make those contributions, again, 'tis the season. Can't get off the dais without trying to get those last little bit of collections in.

So, Mr. Chairman, this completes my report, and the Finance Committee -- of the Finance Committee,

and I move that it's adopted by the Council membership.

MR. GREG ARMSTRONG: Thank, Byron. So I have a motion to adopt the report of the Finance Committee. Do I have a second?

AUDIENCE: Second.

MR. GREG ARMSTRONG: I have a second. All those in favor, please say aye.

(Chorus of ayes.)

MR. GREG ARMSTRONG: Any opposed?

(No response.)

MR. GREG ARMSTRONG: The motion carries.

So, Byron, thank you. The contribution requests will go out shortly, and as we said, we'd love to have kind of a little bit more contribution toward the end of this year.

So, next, we have our second administrative matter, is the report of the Nominating Committee. Jim Hackett chairs the nominating committee but is unable to be with us this morning. In his absence, Clark Smith, a member of the Committee, will now present the Committee's report. Clark?

MR. SMITH: All right. Thank you, Mr. Chairman. The Nominating Committee has agreed on its recommendations for NPC Officers and Chairs and Members of the Agenda and Appointment Committees of the

Council, as well as the five at-large members of the NPC Cochair's Coordinating Committee. So accordingly, on behalf of the Nominating Committee, I'm pleased to offer the following nominations.

NPC Chair, Larry Nichols.

NPC Vice Chair, Darren Woods.

For the Agenda Committee, we recommend the following as members: Alan Armstrong, Deb Caplan, Bob Catell, Greg Garland, Ray Hunt, Gretchen Watkins, Bill Way, Bill White, Mike Wirth, and Daniel Yergin, with Ryan Lance serving as Chair.

For the Appointment Committee, we recommend the following as members: Nick Akins, Lisa Davis, Joe Gorder, John Hess, Terry Jacobs, Mike Linn, Jeff Miller, Pierce Norton, Scott Tinker, and John Walker, with Vicki Hollub serving as Chair.

In addition, we recommend the following as the at-large members of the Cochairs Coordinating Committee: Kevin Book, Leo Denault, Joe Gorder, Doug Suttles, and Jim Teague.

So, Mr. Chairman, this completes the report of the Nominating Committee, and on its behalf, I move that the above slate be elected until the next organizational meeting of the Council. Thank you.

MR. GREG ARMSTRONG: Thank you, Clark. So I

have a motion to adopt the report of the NPC Nominating Committee. Do I have a second?

AUDIENCE: Second.

MR. GREG ARMSTRONG: Thank you. Any discussion?

(No response.)

MR. GREG ARMSTRONG: If not, all those in favor, please say aye.

(Chorus of ayes.)

MR. GREG ARMSTRONG: Any opposed, say nay.

(No response.)

MR. GREG ARMSTRONG: Thank you. The report is adopted. I'd just like to -- before we move into kind of adjournment here, we've got to just say that it's been a pleasure and an honor to be able to serve on behalf of the Council, and I really, really thank Alan and John for their service on the study committees and for Secretary Brouillette, Secretary Perry while he was here, and also Mr. Winberg.

So at this point in time, we do have an opportunity for comments. Are there any comments or questions?

(No response.)

MR. GREG ARMSTRONG: If not, we'll have a motion for adjournment.

AUDIENCE: So moved.

MR. GREG ARMSTRONG: Second?

AUDIENCE: (Off microphone.)

MR. GREG ARMSTRONG: All those in favor, please heartily say aye.

(Chorus of ayes.)

MR. GREG ARMSTRONG: Thank you very much. We'll be back in ten minutes.

(Applause.)

(Proceedings continue with media questions, separately transcribed.)

CERTIFICATE OF REPORTER

I, Linda Metcalf, do hereby certify that the foregoing proceedings were recorded by me and reduced to typewriting under the supervision of For The Record, Inc.; that I am neither counsel for, related to, nor employed by any of the parties to the action in which these proceedings were transcribed; and further, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of the action.

LINDA METCALF, CER