1 U.S. COMMODITY FUTURES TRADING COMMISSION (CFTC)
2 ENERGY AND ENVIRONMENTAL MARKETS ADVISORY COMMITTEE
3 (EEMAC)
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7
8 Videoconference
9 CFTC
10 Office of Secretariat
11 Three Lafayette Centre
12 1155 21st Street, N.W.
13 Washington, D.C. 20581
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16 PRESENT:
17 Rostin Behnam, Acting Chairman, CFTC
18 Dan M. Berkovitz, Commissioner, CFTC
19 Brian D. Quintenz, Commissioner, CFTC
20 Dawn D. Stump, Commissioner, CFTC
21 Dena E. Wiggins, Chair, EEMAC
22 Abigail Knauff, Secretary, EEMAC

1 EEMAC Members:
2 Trabue Bland, ICE Futures U.S.
3 Rob Creamer, FIA PTG
4 Demetri Karousos, Nodal Exchange
5 William McCoy, Morgan Stanley
6 Lopa Parikh, Edison Electric Institute
7 Jackie Roberts, Public Service Commission of West
8 Virginia
9 Derek Sammann, CME Group
10 Tyson Slocum, Public Citizen
11 EEMAC Associate Members:
12 Matt Agen, American Gas Association
13 Susan Bergles, Exelon Corporation
14 Jessica Bowden, Millennium Management
15 Paul Cicio, Industrial Energy Consumers of America
16 Sean Cota, National Energy & Fuels Institute
17 Daniel Dunleavy, Ingevity Corporation
18 Kate Delp, DTCC Data Repository
19 Erik Heinle, Office of the People's Counsel of the
20 District of Columbia
21 Paul Hughes, Southern Company
22 Jeff Hume, Continental Resources

1 Kaiser Malik, Calpine Corporation
2 Dr. John Parsons, Special Government Employee
3 Delia Patterson, American Public Power Association
4 Matt Picardi, Commercial Energy Working Group
5 Malinda Prudencio, The Energy Authority
6 Dr. Richard Sandor, Environmental Financial
7 Products
8 Noha Sidhom, Energy Trading Institute
9 Sarah Tomalty, BP Energy Company
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1 P R O C E E D I N G S

2 MS. KNAUFF: Good morning. As the Secretary
3 of the Energy and Environmental Markets Advisory
4 Committee, it is my pleasure to call this meeting to
5 order. Welcome to the first EEMAC meeting of 2021.
6 Today also marks the sixth meeting with Commissioner
7 Berkovitz as the Sponsor of the Committee. In light of
8 the global response to COVID-19, we are holding today's
9 meeting by videoconference to continue to protect the
10 safety of agency personnel, the EEMAC Members,
11 Associate EEMAC Members, guest panelists, and the
12 public.

13 To ensure that today's virtual meeting goes
14 as smoothly as possible and the recording of the
15 meeting is complete and accurate, please identify
16 yourself before you begin speaking and signal when you
17 are done speaking, so we can continue with the next
18 speaker or question. Please ensure that your phone and
19 your WebEx video is unmuted before you speak and mute
20 both once you are done speaking.

21 In the case that your WebEx is disconnected,
22 please close your browser and enter WebEx again using

1 the link previously provided for today's meeting.
2 Please only turn on your camera when you're presenting
3 or engaging in the Q&A at the end of the panel.
4 Panelists, please also be aware that there may be a
5 slight time lag to switch to the next PowerPoint
6 presentation in between panelists.
7 If you would like to be recognized during the
8 discussion for a question or comment, or any technical
9 assistance, please message me within the WebEx. I will
10 alert EEMAC Chair Dena Wiggins that you would like to
11 speak during the Q&A, that follows the panelists'
12 remarks and presentation.
13 Before we begin this morning's discussion, I
14 would like to turn to Commissioner Berkovitz for his
15 opening remarks.
16 COMMISSIONER BERKOVITZ: Thank you, Abigail.
17 Good morning and good afternoon to our participants in
18 Europe today. And welcome to the Energy and
19 Environmental Markets Advisory Committee. I'm pleased
20 that we were able to conduct this meeting by video
21 today and look forward to when this committee can meet
22 in person again.

1 This meeting of the EEMAC will explore the
2 potential role of carbon markets in the transition to a
3 low-carbon economy. Reducing global carbon emissions
4 to net zero by 2050 is a significant global
5 undertaking.
6 To accomplish this goal, the International
7 Energy Agency is calling for a transformation of how we
8 produce, transport, and consume energy. This
9 transformation will affect all sectors of the economy
10 and retail customers in their daily lives.
11 Although decisive action is necessary to
12 protect our environment and society, the path to net-
13 zero emissions will have significant costs for market
14 participants. Whether incentives, mandates, voluntary
15 reductions, or other approaches are adopted to cut
16 carbon emissions, financial markets can serve to more
17 efficiently allocate the costs and risks of the
18 transition to a low-carbon economy.
19 At today's meeting, we will examine the ways
20 in which energy companies, financial firms, and other
21 market participants are using carbon markets to meet
22 their emissions compliance obligations and hedge risks

1 associated with climate change and green lending, and
2 how these markets might continue to evolve to meet
3 current challenges.
4 The term "carbon markets" refers broadly to
5 primary markets, secondary markets, and derivatives
6 markets for carbon emission allowances and offsets.
7 Primary markets are the mechanism by which
8 allowances and offsets are initially distributed,
9 either through direct allocation by governmental
10 authorities, by auction, or through voluntary measures.
11 Entities may purchase or sell these
12 allowances or offsets in the secondary market for a
13 variety of reasons, including to meet emission
14 standards, speculate on price movements, or provide
15 liquidity.
16 Entities that purchase allowances that meet
17 compliance obligations can use the derivative market to
18 hedge their exposure to potential changes in the cost
19 of these underlying assets and discover prices over
20 longer-term horizon. Speculators, market makers, and
21 intermediaries may also participate in the derivatives
22 market, as they do for other types of commodities.

1 In a well-functioning market system, prices
2 in the primary, secondary, and derivative markets are
3 related economically. While they can be an important
4 tool to achieve climate goals, financial markets may
5 also be negatively affected by climate change.
6 Last fall, the Climate Subcommittee of the
7 CFTC's Market Risk Advisory Committee (Subcommittee)
8 released a landmark report describing how climate
9 change poses a major risk to the U.S. financial system
10 and its ability to sustain the American economy.
11 The report details how climate change could
12 create price shocks in a variety of asset classes,
13 potentially disrupting the functioning of the financial
14 markets and the underlying economy. The Subcommittee
15 recommended a variety of actions for financial market
16 participants and regulators to recognize and address
17 these risks.
18 With respect to the CFTC in particular, the
19 Subcommittee recommended that the agency conduct
20 research to understand how climate-related risks could
21 impact markets and their participants under CFTC
22 oversight, including central counterparties, futures

1 commission merchants, traders, and funds.
2 The Subcommittee urged the CFTC to coordinate
3 with other regulators to develop a robust ecosystem of
4 climate-related risk management products. It further
5 recommended that the CFTC consider expanding the CFTC's
6 risk management rules and related quarterly risk
7 reports -- quarterly risk exposure reports, excuse me,
8 to cover material climate-related risks.
9 I commend the Subcommittee for its work in
10 producing this report and Acting Chair Behnam for his
11 leadership of the MRAC and on the issue of climate
12 change generally here at our agency.
13 I see three principal ways in which the CFTC,
14 as a financial market regulator, can support the
15 transition to a carbon-neutral economy.
16 First, the Commission is charged with
17 ensuring the integrity of the markets it regulates, and
18 this includes carbon derivatives markets. This
19 requires an understanding of how the various carbon
20 markets interact and how companies use them to meet
21 compliance obligations, manage risks, and discover
22 prices.

1 Second, the CFTC should work with exchanges
2 and market participants on the development of new
3 products that will help companies meet these needs.
4 And third, as the climate risk subcommittee
5 recommended, the CFTC should ensure appropriate
6 management and disclosure of climate-related risks.
7 Market-based mechanisms, such as cap-and-
8 trade programs, are intended to achieve climate goals
9 at a lower cost and to direct investments to cost-
10 effective projects and technologies for reducing
11 emissions.
12 Increased investments in sustainable
13 technologies can lead to more efficient greenhouse gas
14 reductions, but this requires timely and transparent
15 information, not only for current prices associated
16 with such reductions but also for future prices.
17 The relationship between the primary and
18 secondary markets and the derivatives markets for
19 carbon can drive more informed decision-making and more
20 effective allocation of resources. The price of carbon
21 allowances also can affect the prices of other
22 commodities such as fossil fuels.

1 Given these linkages and the potential for
2 carbon markets to meaningfully contribute to the
3 reduction of carbon emissions, the CFTC should work
4 with other regulators and stakeholders to optimize the
5 effectiveness and integrity of these interrelated
6 markets.
7 To that end, our first panel will examine the
8 cap-and-trade programs in the United States, European
9 Union, and United Kingdom, as well as lessons learned
10 from these programs and ways in which they may evolve
11 in the future.
12 We are fortunate to be joined today by
13 Benjamin Grumbles, the Secretary of the Maryland
14 Department of the Environment, who is here today on
15 behalf of the Regional Greenhouse Gas Initiative, or
16 RGGI; Rajinder Sahota, Deputy Executive Officer of
17 Climate Change and Research for the California Air
18 Resources Board; Hans Bergman, the Head of the Unit for
19 ETS Policy Development and Auctioning within the
20 European Commission's Directorate General for Climate;
21 and Gordon Bennett, Managing Director of Utility
22 Markets for Intercontinental Exchange, which hosts

1 allowance auctions for the UK Emissions Trading System.
2 Another way in which the CFTC can support the
3 move to a low-carbon economy is through its mandate of
4 promoting responsible innovation in markets and among
5 market participants. In order to meet the goal of zero
6 emissions by 2050, investment in renewable energy
7 infrastructure projects must ramp up rapidly.
8 Investors will need to manage the risks of those
9 investments with appropriate hedging tools, including
10 both exchange-traded and over-the-counter derivatives.
11 Derivatives also allow commercial entities
12 and investors to manage exposure to changes in the
13 price of these assets due to climate change and
14 transition risks caused by the shift to a net-zero
15 economy.
16 In addition, entities with emission
17 compliance obligations participate in the physical
18 markets to ensure we have appropriate allowances or
19 offsets to meet those obligations.
20 As energy standards evolve, futures contracts
21 will need to evolve to respond to changes in the
22 physical markets. The Commission should work with

1 exchanges and market participants as they develop
2 climate-related products and services to meet these
3 needs, as well as collaborate with our domestic and
4 international counterparts to develop consistent
5 standards for environmental products.
6 Our second panel today will explore the
7 current state of exchange-listed carbon derivative
8 products. We will hear from Gordon Bennett of ICE;
9 Christian Schneider, Managing Director of Strategy for
10 Nodal Exchange; and Derek Sammann, Senior Managing
11 Director and Global Head of Commodities at CME Group
12 about the carbon products offered on their exchanges.
13 Our third panel will feature a diverse group
14 of stakeholders who will provide their perspective on
15 how the derivative markets operate as risk management
16 and price discovery tools and how they expect these
17 markets to change over time.
18 We welcome Evan Ard, Executive Managing
19 Director of Evolution Markets, who will discuss the
20 over-the-counter carbon markets. Suzi Kerr, Chief
21 Economist of the Environmental Defense Fund, will
22 discuss the economics of carbon pricing and

1 considerations for developing equitable carbon pricing
2 policies.
3 Erik Heinle, Assistant People's Counsel for
4 the Office of People's Counsel for the District of
5 Columbia, who will share a rate-payer perspective.
6 Annette Nazareth, Senior Counsel at Davis Polk will
7 discuss the work of the Task Force on Scaling Voluntary
8 Carbon Markets and its recently issued *Public*
9 *Consultation Report*.
10 Dena Wiggins, President and CEO of the
11 Natural Gas Supply Association, will talk about why
12 NGSA views carbon pricing as the most effective long-
13 term solution to climate change. And Matt Picardi,
14 Vice President of Regulatory Affairs for Shell Energy
15 North America, on behalf of the Commercial Energy
16 Working Group, will discuss carbon market design.
17 A third area in which the CFTC should play a
18 role in the transition to a low-carbon economy is with
19 respect to the management and disclosure of climate-
20 related risks. For example, the CFTC currently
21 requires commodity pools and advisors to address pool
22 performance and the risks of speculating derivatives.

1 The CFTC also requires certain registrants,
2 such as swap dealers, to periodically report material
3 risks, such as credit, market, and operational risks.
4 The Commission should examine how climate-
5 related risks are currently considered and reported by
6 registrants and determine whether additional
7 considerations of climate-related risks or disclosures
8 are appropriate. While this aspect of risk management
9 is not specific to the carbon markets discussion today,
10 it is an issue that requires further exploration and
11 one that the EEMAC could consider in a future meeting.
12 Our final panel of the day -- on our final
13 panel of the day, we will hear a presentation from CFTC
14 staff: Rahul Varma of the Market Intelligence Branch in
15 the Division of Market Oversight, and Bill Heitner of
16 the Risk Surveillance Branch in the Division of
17 Clearing and Risk.
18 Rahul and Bill will discuss the impact on the
19 derivatives market of the winter storm in Texas in
20 February 2021 that caused widespread power outages and
21 hardship for Texas consumers. I appreciate Rahul's and
22 Bill's excellent work in preparing this presentation

1 and the dedication of the CFTC staff in closely
2 monitoring this and other market events.
3 Finally, I would like to conclude by thanking
4 Acting Chair Behnam, Commissioner Quintenz, and
5 Commissioner Stump for their participation and support
6 in today's meeting.
7 I would also like to thank the EEMAC members
8 and our guest panelists for their contributions to this
9 meeting: Dena Wiggins for her dedicated service as the
10 EEMAC Chair, Lucy Hynes in my office for her work in
11 supporting this committee, and specifically, Abigail
12 Knauff for her exemplary service as Secretary of the
13 EEMAC and for always making these meetings so
14 informative and seamless and make them look easy.
15 And the fact that these meetings go smoothly
16 is a real testament to Abigail's and Lucy's work. I am
17 very much looking forward to today's meeting and to
18 hearing from our very distinguished panelists. With
19 that, I'll turn it back to Abigail. Abigail, thank
20 you.
21 MS. KNAUFF: Thank you, Commissioner
22 Berkovitz. And now, I recognize Acting Chairman Rostin

1 Behnam with his opening remarks.
2 ACTING CHAIRMAN BEHNAM: Thank you, Abigail,
3 and good morning and welcome to the CFTC's Energy and
4 Environmental Markets Advisory Committee meeting.
5 First off, I want to thank Commissioner Berkovitz for
6 his leadership, and extend a special thanks to Abigail,
7 Lucy, and all of Commissioner Berkovitz' staff who
8 serve to put together this EEMAC meeting today.
9 Special thanks, of course, to Abigail and Dena Wiggins
10 as well.
11 I also want to thank and acknowledge the
12 EEMAC members and invited speakers, including our very
13 own CFTC staff who will be participating on the panels
14 today. And of course, a special thanks to all of the
15 CFTC staff who helped us bring these meetings together.
16 As Dan pointed out, these are very difficult to run
17 smoothly, but they do and it's a testament to their
18 hard work, especially in these challenging times.
19 As you can imagine, I am pleased and excited
20 that today's meeting will examine how derivatives
21 markets can facilitate the transition to a low-carbon
22 economy and will include an update on recent events in

1 the energy market.

2 With panels dedicated to domestic and

3 international cap-and-trade carbon markets, exchange-

4 listed carbon derivatives, and exploration of the

5 underlying market, I believe the EEMAC is taking a

6 critical step at a time when anticipation and

7 opportunity are building exponentially.

8 Financial markets, particularly the

9 derivatives markets overseen by the CFTC, are used for

10 hedging a myriad of risks in the traditional commodity,

11 as well as interest rate, foreign exchange, credit, and

12 equity markets.

13 They also serve as powerful information

14 resources for hedgers and investors alike when it comes

15 to price discovery, market transparency, and perhaps

16 most importantly for our purposes today, facilitating

17 the allocation of capital towards sustainable

18 investments and to financial, agricultural, and

19 industrial sectors as they manage the impact of

20 physical risks in transition towards a low-carbon

21 economy.

22 Inasmuch as Commissioner Berkovitz and I have

1 prioritized addressing the impact of climate change on
2 the derivatives and larger financial markets, I'd be
3 remiss if I did not take this opportunity to note that
4 this is not the first time that EEMAC examined the
5 promise and transition to a low-carbon economy.
6 And I do not do this to suggest that there is
7 nothing new or repetitive about today's agenda.
8 Rather, I'd like to take the opportunity to honor our
9 past CFTC Commissioner Bart Chilton.
10 We lost Bart a little over two years ago,
11 just as leaders across domestic and international
12 regulators and financial institutions were building the
13 momentum needed for the industry, public, and
14 policymakers to recognize that the impact of climate
15 change can no longer be compartmentalized as an
16 environmental issue.
17 Today's EEMAC did not come at a more
18 appropriate time. We are at an inflection point in the
19 climate discussion, and I'm confident that today's
20 meeting will further advance our understanding of the
21 critical action needed to address climate change.
22 Commissioner Chilton chaired the first

1 meeting of the expanded EEMAC in May of 2009, which
2 featured panelists from our own Division of Market
3 Oversight providing "An Overview of Environmental
4 Markets: CFTC & a Carbon-Constrained World."
5 Even before that in 2008, Commissioner
6 Chilton used his signature flair to deliver statements
7 and speeches, lauding efforts by legislators, markets,
8 and market participants to address the increasingly
9 critical need to incorporate climate-related market
10 risks into our financial markets and to protect our
11 environment.
12 He intrigued us with titles such as, "The
13 Start of Something Green," "It's Not Easy Being Green …
14 Markets, in the U.S.," "Banquet of Consequences,"
15 "Green CAT Markets: You Gotta Show Some Guts," and one
16 that inspires me is "The Most Important Thing."
17 In June of 2008, Bart asked his New York City
18 audience, "What is the most important thing you have
19 never done?" To avoid a cliffhanger and ever the
20 statesman, Bart moved beyond his own life and thought
21 about the U.S. and the world and concluded that as a
22 nation, we have failed to address climate change.

1 There's now a common understanding that
2 climate change not only presents systemic risk, sub-
3 systemic shocks, and wide-ranging ripple effects to the
4 U.S. financial system and larger economy. It presents
5 opportunities as we work to ensure decisive and
6 cohesive leadership over the markets and institutions
7 charged with monitoring and managing risk, capital, and
8 asset allocation, especially as the physical risks of
9 the sudden and extreme weather events associated with
10 climate change have an increasingly profound impact on
11 our most vulnerable communities.
12 Bart would be so pleased that we have
13 convened today almost 13 years later to take the steps
14 needed to replace the "never" with "ever."
15 For my part, in support of the Commission and
16 industry efforts, I've spent the last several years as
17 sponsor of the CFTC's Market Risk Advisory Committee,
18 within which is housed the Climate-Related Financial
19 Market Risk Subcommittee. And I appreciate
20 Commissioner Berkovitz for his recognition of their
21 work.
22 Last September, the subcommittee released the

1 report *Managing Climate Risk in the U.S. Financial*
2 *System*, the first of its kind ever from a U.S.
3 government entity. I followed its release with
4 testimony before the House Select Committee on the
5 Climate Crisis and presentations in other venues
6 focused on climate-related market risk and
7 incorporating sustainability resilience into our
8 financial systems.
9 More recently, in March, I announced the
10 establishment of the Climate Risk Unit or CRU within
11 the CFTC. The CRU will be comprised entirely of staff
12 across our offices and divisions and will focus on the
13 role of the derivatives markets and CFTC as a market
14 regulator in understanding pricing and addressing
15 climate-related risk.
16 To the extent that new products and market
17 developments must accurately, uniformly, transparently,
18 and fairly factor climate-related risks into pricing
19 and related market function, the Commission needs to
20 engage early in order to ensure coordination with the
21 larger financial regulatory space, both domestically
22 and abroad, and to provide other support as well.

1 The CFTC's unique mission focused on risk
2 mitigation and price discovery puts us on the
3 frontlines as we will increasingly need to use our
4 wide-ranging and flexible authorities to prepare for
5 and address the impact of climate change, and more
6 specifically, the transition to a low-carbon economy.
7 And thinking about the future of the Climate
8 Risk Unit as a resource for the Commission and the
9 current administration's "all of government" approach,
10 the goal is really to dedicate the resources we have --
11 and that includes our advisory committees -- towards
12 raising risk management awareness and visibility within
13 our markets and the broader economy so that we can
14 identify where the holes are, where we need to be most
15 vigilant in both our support and leadership as
16 regulators.
17 At the heart of the EEMAC, the MRAC, the
18 Climate Report, the CRU, all the remarks you will hear
19 today, and the legacy of Commissioner Bart Chilton is
20 the concept of partnerships. In speaking about climate
21 change and financial markets and market structures, and
22 what role policy makers should and could play.

1 As the remit of our new administration
2 supports a firm commitment to full participation in the
3 global effort, I am fully prepared for the CFTC to be
4 an active player, partner, and leader. To that end, I
5 am very much looking forward to the discussion.
6 And I want to end these remarks by again,
7 thanking Commissioner Berkovitz, Abigail Knauff, Dena
8 Wiggins, and the esteemed members and guests of the
9 EEMAC. I look forward to today's discussion. Thank
10 you.
11 MS. KNAUFF: Thank you Acting Chairman
12 Behnam. I now recognize Commissioner Quintenz to give
13 his opening remarks.
14 COMMISSIONER QUINTENZ: Thank you, Abigail,
15 and thank you to you for your leadership, staff level,
16 and to Lucy and, of course, to Commissioner Berkovitz
17 for organizing today's meeting.
18 Being such a thoughtful leader of this
19 advisory committee over the last number of years, I've
20 always found these discussions, and all the advisory
21 committees, to be incredibly informative and fruitful
22 and productive in providing me and the agency with just

1 a lot of wisdom and experience in such an esteemed
2 group of members.
3 And I'd like to thank the members for
4 attending today, Dena Wiggins, of course, for your
5 leadership. These are very important issues that we'll
6 be hearing about today.
7 The derivatives market is going to play an
8 absolutely critical role in managing the financial
9 risks associated with climate change as well as
10 potential transition risks and impacts from policy
11 decisions.
12 And I've always thought that the impact of
13 commerce on the environment has -- is captured through
14 traditional economic, classical economic theory, and
15 the free rider problem, which poses that if an access
16 or use of a good can be done so without cost, then that
17 good could potentially be overused, underproduced, or
18 degraded.
19 And the economic solution to a free rider
20 problem is to not make it free, which is why I think a
21 cap-and-trade approach has always had some merit to it.
22 And I'm thrilled that we're going to be hearing about

1 the experience of some jurisdictions in trying to
2 implement that.
3 Of course, government-created markets need to
4 be done very carefully and need to be done very
5 thoughtfully. I think we can all look at the rent
6 market to understand the benefits and the risks of
7 government-created markets and hopefully learn from all
8 of those examples.
9 And I'm thrilled to hear from the rest of the
10 participants around the approach the derivatives
11 markets are currently taking and can take in the future
12 to -- with innovative products in the traditional
13 capitalist economic framework in the United States to
14 continue to address these issues.
15 So, thanks again to Commissioner Berkovitz.
16 Thank you, Abigail and Lucy and Dena, and appreciate
17 all the membership, your participation, and for the
18 thoughtful presentations and the work that went in
19 today. Thank you.
20 MS. KNAUFF: Thank you Commissioner Quintenz.
21 I now recognize Commissioner Stump to give her opening
22 remarks.

1 COMMISSIONER STUMP: Thank you, Abigail, and
2 thanks, Commissioner Berkovitz, for holding the
3 meeting. And thanks to Dena for facilitating and for
4 her leadership of the EEMAC. I think most --
5 everything has been said at this point, so I'll be
6 very, very brief.
7 I think the CFTC often is not overlooked, but
8 I think the public doesn't always recognize the
9 enormous role we play in so many different markets and
10 the folks that we regulate play and so -- in
11 facilitating well-functioning markets.
12 And I think this is another example of like
13 many markets we regulate, oftentimes, the investor
14 demand drives the market. And oftentimes, the risk
15 mitigation is driving the market. And so, in this
16 case, I think it's worth pointing out that some
17 investors may be focusing on the impact of climate
18 change itself, while others really need these risk
19 mitigation tools.
20 And the policies to address climate change
21 may have a huge impact on their businesses that they
22 need to operate and that we all depend upon; for

1 example, the creation of stranded assets, generating
2 large changes in the asset prices, and the credit risks
3 that may be follow-on effects of various climate-
4 related policies.
5 And so regardless of what or who creates that
6 momentum, and my own personal views on the preferred
7 emphasis, I think the role of the CFTC remains to
8 preserve the functioning of the consequent risk
9 mitigation tools.
10 And so, whether that's driven by government
11 mandates, as it has been in other jurisdictions, or if
12 the consumer or market demand creates new risks, then I
13 think the derivatives will be used to manage that risk,
14 just as they are in many other markets that we
15 regulate.
16 And I'm so pleased that Commissioner
17 Berkovitz has provided the opportunity today to
18 highlight those derivative products that we already
19 regulate. I think it's worth pointing out we already
20 regulate over 100 products that have a carbon-related
21 component to them. And I think perhaps that's not well
22 understood or publicized.

1 And so, I'm very pleased that we have the
2 opportunity today to hear from those who have
3 facilitated the development of those markets. And I'm
4 also interested to hear more about the development of
5 the primary markets that Commissioner Berkovitz
6 mentioned because the CFTC has a keen interest in the
7 manner in which those markets develop to recognize as
8 input in the various voluntary endeavors already
9 underway.
10 These are important considerations for the
11 development of our markets, the derivatives markets.
12 In order for them to be well-functioning, we need to
13 have a good grasp on what the inputs into those
14 underlying cash markets are.
15 So, I'm very pleased that we're having a
16 meeting. I look forward to all of the presentations
17 and appreciate all of the work that has gone into
18 preparing for the meeting. Thank you.
19 MS. KNAUFF: Thank you, Commissioner Stump.
20 I'm going to turn the meeting over to Dena now.
21 CHAIR WIGGINS: Thank you, Abigail.
22 Commissioner Berkovitz, Mr. Chairman, Commissioner

1 Quintenz, and Commissioner Stump, I'm very honored to
2 be a member of this body, the EEMAC, and to continue to
3 serving as the Chair.
4 The Committee serves an important vehicle to
5 discuss matters of concern to hedgers, consumers,
6 exchanges, firms, end users within our energy and
7 environmental markets, as well as the Commission's
8 regulation of these markets.
9 Today's meeting serves as a timely
10 opportunity to discuss carbon markets and pricing.
11 This is a topic that's near and dear to our hearts, at
12 the Natural Gas Supply Association. I very much
13 appreciate the fact that Commissioner Berkovitz has
14 allowed, as the Sponsor of this Committee, to focus our
15 attention today on these important topics.
16 I look forward to learning more from my
17 colleagues as the day continues, and as we hear from
18 all of the interesting panelists we have coming up.
19 And as Chair, I also look forward to facilitating the
20 discussion of the Associate Members' perspective of the
21 EEMAC and working with the EEMAC members to provide the
22 Commission with feedback and recommendations that

1 assist the agency and its oversight of our markets.
2 To ensure that today's discussion is
3 consistent with the EEMAC charter, which prohibits
4 Associate Members from providing reports and
5 recommendations directly to the Commission, we will
6 first take questions and comments from the EEMAC
7 Associate Members after the panelists have made their
8 presentations and prepared remarks on the respective
9 panels. And then we will turn to the EEMAC Members for
10 their questions and comments on the panelists'
11 presentations, prepared remarks, and any feedback
12 provided by the Associate Members.
13 As Abigail mentioned earlier, please use the
14 chat function to alert her if you have a question or a
15 comment, and we will recognize you as a speaker after
16 receiving your notification.
17 Before we begin our first panel, we would
18 like to do a roll call of the Members, Associate
19 Members, and guest panelists so that we have your
20 attendance on the record. And Abigail will lead the
21 roll call.
22 (Brief Pause.)

1 COMMISSIONER BERKOVITZ: Abigail, I think
2 your muted.
3 MS. KNAUFF: EEMAC Members, after I say your
4 name and organization, please indicate that you're
5 present. Please make sure your phone is not muted. If
6 you we were unable to hear your response, please send
7 me a message via the WebEx chat to confirm that you are
8 present on today's call so that I can correct the
9 record.
10 Trabue Bland, ICE Futures U.S.?
11 (No response.)
12 MS. KNAUFF: Rob Creamer, FIA PTG?
13 MR. CREAMER: Present.
14 MS. KNAUFF: Thank you, Rob.
15 Demetri Karousos, Nodal Exchange?
16 (No response.)
17 MS. KNAUFF: William McCoy, Morgan Stanley?
18 MR. McCOY: Present.
19 MS. KNAUFF: Thank you, Bill.
20 Lopa Parikh, Edison Electric Institute?
21 MS. PARIKH: Present.
22 MS. KNAUFF: Thank you, Lopa.

1 Jackie Roberts, Public Service Commission of
2 West Virginia?
3 (No response.)
4 MS. KNAUFF: Derek Sammann, CME Group?
5 MR. SAMMANN: Present.
6 MS. KNAUFF: Thank you, Derek.
7 Tyson Slocum, Public Citizen?
8 (No response.)
9 MS. KNAUFF: Now, we're going to turn to the
10 EEMAC Associate Members. After I say your name, please
11 indicate that you are present.
12 Matt Agen, American Gas Association?
13 MR. AGEN: Present.
14 MS. KNAUFF: Thank you, Matt.
15 Susan Bergles, Exelon Corporation?
16 (No response.)
17 MS. KNAUFF: Jessica Bowden, Millennium
18 Management?
19 MS. BOWDEN: Present.
20 MS. KNAUFF: Thank you, Jessica.
21 Paul Cicio, Industrial Energy Consumers of
22 America?

1 MR. CICIO: Present.
2 MS. KNAUFF: Thank you, Paul.
3 Sean Cota, National Energy & Fuels Institute?
4 (No response.)
5 MS. KNAUFF: Daniel Dunleavy, Ingevity
6 Corporation?
7 (No response.)
8 MS. KNAUFF: Kate Delp, DTCC Data Repository?
9 MS. DELP: Present.
10 MS. KNAUFF: Thanks, Kate.
11 Erik Heinle, Office of the People's Counsel
12 of the District of Columbia?
13 MR. HEINLE: Present and good morning.
14 MS. KNAUFF: Thank you, Erik.
15 Paul Hughes, Southern Company?
16 (No response.)
17 MS. KNAUFF: Jeff Hume, Continental
18 Resources?
19 MR. HUME: Present.
20 MS. KNAUFF: Thank you, Jeff.
21 Kaiser Malik, Calpine Corporation?
22 MR. MALIK: Present.

1 MS. KNAUFF: Thank you, Kaiser.
2 Dr. John Parsons, Special Government
3 Employee?
4 DR. PARSONS: Present.
5 MS. KNAUFF: Thank you.
6 Delia Patterson, American Public Power
7 Association?
8 (No response.)
9 MS. KNAUFF: Matt Picardi, Commercial Energy
10 Working Group?
11 MR. PICARDI: Present.
12 MS. KNAUFF: Thank you, Matt.
13 Sarah Tomalty, BP Energy Company?
14 MS. TOMALTY: Present.
15 MS. KNAUFF: Thank you, Sarah.
16 Malinda Prudencio, The Energy Authority?
17 MS. PRUDENCIO: Present.
18 MS. KNAUFF: Thank you, Malinda.
19 Dr. Richard Sandor, Environmental Financial
20 Products?
21 DR. SANDOR: Present.
22 MS. KNAUFF: Thank you, Dr. Sandor.

1 Noha Sidhom, Energy Trading Institute?
2 MS. SIDHOM: Present.
3 MS. KNAUFF: Thank you, Noha. Thank you.
4 I will now turn the meeting back over to
5 Dena.
6 CHAIR WIGGINS: Thank you, Abigail. Our
7 first panel today will discuss domestic and
8 international cap-and-trade markets. We will hear
9 prepared remarks from Secretary Grumbles speaking on
10 behalf of the Regional Greenhouse Gas Initiative;
11 Rajinder Sahota, California Air Resources Board; Hans
12 Bergman, the European Commission; Gordon Bennett, ICE.
13 And I think with that, we are ready to begin.
14 Secretary Grumbles, please go ahead.
15 SECRETARY GRUMBLES: Thank you so much. Can
16 everyone hear me okay? Yes? Good? Okay.
17 CHAIR WIGGINS: Yes, we can. Thank you.
18 SECRETARY GRUMBLES: Thank you so much. This
19 is an honor to be part of this discussion. And I will
20 -- I have some slides to go through. But in deference
21 to my esteemed panel members, I will try to be quick
22 and give you a broad overview.

1 I just -- I want to state at the outset, as
2 the PowerPoint slides are brought up for you to look
3 at, that RGGI -- we call it RGGI, the Regional
4 Greenhouse Gas Initiative -- has an Executive Director
5 as part of RGGI Inc., and his name is Andrew McKeon.
6 And his staff report to me and other members of the
7 board that oversees the actual initiative, which is not
8 a single program. It's essentially 11 programs within
9 each of the 11 states that participate in this Regional
10 Greenhouse Gas Initiative.
11 So, Abigail and all Commission members, when
12 we have follow-up discussions getting into the
13 derivatives and other aspects, Andrew is a great
14 resource. And I am excited and honored to be part of
15 this discussion.
16 If you go to the next slide, please. So, a
17 little bit more, if you'll bear with me on what RGGI is
18 and what it is not, RGGI-11 means currently 11 states
19 participate in the effort that puts a price on carbon.
20 And what could be more important right now
21 than a carbon-driven, citizen-centered, market-based
22 approach to deal with this growing threat of carbon

1 pollution and climate change? This collaborative, this
2 partnership of states, as you can see, covers enormous
3 political and geographic diversity and a large chunk of
4 the economy and population for the United States.
5 And the RGGI program is based on each -- the
6 political leadership in each state, committing not to
7 be part of it, of an interstate compact, but a
8 partnership where each state has legally enforceable
9 commitments on the regulated entities within its state.
10 And policy is driven by the environmental secretary and
11 the energy or economic secretary of each of the states.
12 So, each state has energy and the environment at the
13 helm, shaping policy and future directions.
14 Next slide, please. This is, as you would
15 expect, it is focused on the power sector, coal-fired
16 and natural gas-fired power plants of 25 or greater
17 megawatts, although New York showing flexibility that
18 the RGGI effort has. New York has agreed to modify
19 theirs to 15 or greater megawatts facilities.
20 The state -- each of the states allocate the
21 allowance. We do not give them away. We allocate the
22 proper number based on the amount of emissions coming

1 from the coal-fired or natural gas facilities covered
2 in our programs.
3 And then the regulated entities have
4 quarterly auctions and the secondary market to ensure
5 that at the end of the three-year control period, they
6 are held accountable and have the proper number of
7 allowances. They are fungible, bankable, tradable.
8 Each state respects the efforts of the other state as
9 part of this. That's what makes them fungible.
10 My real focus as the Vice Chairman of RGGI is
11 to ensure that our cap-and-trade program, which we
12 really call a cap-and-invest program -- and it's
13 "invest" because we also want to emphasize the
14 investment part of it, how the proceeds are utilized by
15 each of the states.
16 But the key for us in this environmental
17 program is to ensure that the regional cap is stringent
18 enough to produce real environmental results. So, we
19 modify the cap over time. Currently, it's 119.8
20 million tons.
21 It gets adjusted through a bank adjustment
22 and when we have our periodic revisiting of the

1 stringency of the cap, and the auction proceeds are
2 reinvested. And I'll tell you a little bit more about
3 that.
4 Next slide, please. So, the bumper sticker
5 slogan for RGGI is that over the last 13 years, this
6 tracks over the last decade, we have slashed our
7 greenhouse gas emissions in half and have enjoyed
8 steady and continued GDP, economic progress, decoupling
9 GDP and environmental leadership so that we can have
10 both.
11 Next slide, please. This is just to give you
12 a somewhat colored perspective of the energy sector and
13 the trends. And I would just simply spend less than 30
14 seconds on this to say if you look at the gray, you can
15 see that natural gas is increasing but not
16 dramatically, not as fast as the coal sector at the
17 bottom is decreasing.
18 The state of Maryland, which has three coal-
19 fired power plants, when I started as environment
20 Secretary under Governor Larry Hogan, we had eight. We
21 now have basically four, but it will be three by later
22 this year. And before 2030, we will not have the coal-

1 fired power plants. We will -- they will be run in
2 either as partly as natural gas or embracing
3 renewables. But this is a picture of the energy
4 generation trends.
5 Next slide, please. One of the success
6 stories and the recipes for continued success, what I
7 believe is not only the first cap-and-trade program,
8 but the most successful in the U.S., I think other
9 panelists may dispute that. But we have regular,
10 comprehensive, entirely bipartisan and professional
11 review of cap stringency and other safeguards.
12 This program has tremendous degree of public
13 transparency and scrutiny and engagement on how to set
14 the cap, at what levels to set the cap, what safeguards
15 should be included to reduce the risk of sticker shock
16 or dramatic changes in the price of electricity, which
17 we have not seen based on the very safeguards we have.
18 And 2017 was a critical moment in the history
19 of the program where we, on a completely bipartisan
20 basis among the United States at the time, agreed to
21 reduce our cap by 30 percent by 2030 and adopt --
22 I hope you get a chance to get into this more

1 and more detail later, but the -- we've always had a
2 cost containment reserve to ensure that the cost of the
3 allowances in the market in the auction do not go above
4 a certain level. Right now, the cost containment
5 reserve, the dollar level is $13.
6 And now we added an emissions containment
7 reserve, so that if there were too many allowances in
8 the market and the price was getting too low for the
9 allowances, we would take away some of those allowances
10 and put them in the environmentally-driven containment
11 reserve.
12 And we look forward to an additional program
13 review and cap adjustment, getting in earnest on that
14 next year in the spring.
15 Next slide, please. We have quarterly
16 auctions -- in fact, today. Yesterday, today, we are
17 in the process of completing our 52nd quarterly
18 auction. Every one has been successful -- integrity,
19 accountability, progress on reducing greenhouse gas
20 emissions, and increasing proceeds for investment by
21 the states in clean energy and in other public
22 interest.

1 You see the prices can vary over time. We
2 are enjoying, as expected, a continued boost in the
3 price -- the clearing price for the allowances in the
4 market. And tomorrow, we will disclose publicly what
5 the results of the 52nd auction are. $3.9 billion in
6 proceeds, which are invested among the states, based on
7 the percentage of regulated entities in each of the
8 states.
9 And we have a tracking system, which is also
10 one of the key recipes for success to ensure a RGGI
11 COAT stands for Regional Greenhouse Gas Initiative
12 Carbon Dioxide Allowance Tracking System. And that
13 helps us ensure that there's no funny business, that
14 there's no -- nothing going on that would put at risk
15 our market base and steady performing approach to
16 reducing greenhouse gas emissions.
17 The secondary market is robust. It's an
18 additional component that provides great flexibility so
19 that the market continues to trade between these
20 quarterly auctions.
21 Next slide. Only a couple more. A little
22 more detail on the auction structure itself. You can

1 read on the PowerPoint, and for those of you who are
2 listening, the platform is that it's electronic,
3 internet-based. We focus on the integrity of the
4 process.
5 We have an independent market monitor
6 contractor who is currently Potomac Economics. And
7 it's through an awards process, the bids ranked by
8 price high to low. That's the structure.
9 Next slide, please. There's always -- there
10 was a reserve price, a hard price floor, which is very
11 low, a couple dollars. We do not set -- the
12 governmental entities that run our RGGI efforts do not
13 set the price. The market sets the price, the auctions
14 and the secondary market.
15 But we do have two very important mechanisms,
16 as I mentioned, that the cost containment reserve is to
17 make sure that prices are not -- that the clearing
18 price, the cost of the allowance in the marketplace is
19 not unacceptably high. Rarely has that been used.
20 We also have this new emissions containment
21 reserve to make sure that we don't have too many --
22 that the price isn't too low, which would reduce the

1 stringency of our environmental success. And that
2 would -- but this is the first year where that is in
3 place, and that dollar amount has not been triggered
4 yet for taking the allowances away from the
5 marketplace.
6 Next slide, please. Here's a little busy. I
7 apologize for that, but it shows you that the clearing
8 price is on an upward tick, and we're encouraged by
9 that. And one of the most important points to make
10 about the auction and the success of the RGGI program
11 is that it is growing in terms of the number of states
12 that are participating in RGGI.
13 Last year, Virginia -- the Commonwealth of
14 Virginia joined. They participated in the January 2021
15 auction for the first time. That's a huge increase in
16 the size of RGGI. The year before, New Jersey rejoined
17 the program.
18 Right now, we're in discussions with,
19 providing technical information to the Commonwealth of
20 Pennsylvania, which is in the process of attempting to
21 join RGGI. They have been working on this through
22 regulations over the last year and a half. They are

1 heavily engaged with the legislature, and Governor Wolf
2 is pushing hard. But if they are successful in joining
3 RGGI, that will increase the number of allowances that
4 recovered emissions in the -- within the PJM power grid
5 by 60 to 80 percent, a huge game changer by adding
6 Pennsylvania.
7 And North Carolina continues to show interest
8 in joining the RGGI program as well.
9 Next slide. We have an independent market
10 monitor to ensure that integrity is maintained and that
11 public transparency and accountability are provided as
12 well. That is contracted out, and we're proud of that
13 note and realize that is a very important component to
14 the success of the RGGI program.
15 Next slide. And this is just a little bit
16 more for your reading enjoyment on our tracking system
17 for the emissions themselves. This is a very important
18 -- a very important database for each of the state and
19 its governors and the environment and the energy
20 secretaries when we revisit the size of the cap and
21 other program reviews. It's using this information.
22 How many allowances are there? How much progress --

1 how much more progress do we need to make in reducing
2 greenhouse gas emissions?
3 Next slide. This just shows that
4 particularly since political elected leaders oversee --
5 the governors oversee their state's participation in
6 the RGGI program, this is such a critically important
7 component of the basic -- there's a lot of green --
8 there's a lot of green in the investments and the types
9 of projects that benefit energy efficiency, clean
10 energy, renewable energy.
11 The State of Maryland, the legislature, has
12 chosen that about 50 percent of the annual proceeds
13 should go towards direct bill assistance to help on the
14 affordability issue as well as reliability and
15 resilience.
16 Last slide, I believe. Yeah. I just wanted
17 to say that approximately 3 billion and a bit by an
18 independent review group estimated for the RGGI program
19 over the last decade based on the investments in energy
20 efficiency, clean energy jobs.
21 Look forward to answering any questions you
22 might have. Thank you again for the opportunity to

1 address you this morning.
2 CHAIR WIGGINS: Thank you very much. Our
3 next speaker, Rajinder?
4 MS. SAHOTA: Good morning, Commissioners,
5 everyone. I just want to thank Commissioner Berkovitz
6 for the invitation to be here today. It's been a long
7 time since we've actually had a conversation with CFTC.
8 We had a four-year break for a while. So, it's nice to
9 reconnect with colleagues and reestablish that
10 relationship.
11 Next slide, please. Next slide. Great. So,
12 California has made significant progress in reducing
13 its GHG emissions. Our per capita and per GDP
14 emissions have been declining, and we actually met our
15 2020 target four years earlier than mandated by law,
16 but we have to return to 1990 levels by 2020. We
17 actually fell below 1990 levels in 2016 and have
18 remained under that limit.
19 It's important to know what emissions we
20 cover in the program, and the pie chart shows our
21 fossil energy and industrial inventory. We are a huge
22 importer of power, and so we also claim the emissions

1 associated with the power that serves the state. And
2 as with most jurisdictions, transportation is the
3 leading source of GHG emissions.
4 What else is important on that slide is that
5 80 percent of everything in that slide is covered by
6 the cap-and-trade program. So, we have a high bar for
7 what can be quantified and priced under a carbon
8 pricing mechanism. Hard-to-quantify emissions, such as
9 fugitives, are not regulated by the cap-and-trade
10 program and left to direct regulation.
11 Next slide. As with most cap-and-trade
12 programs, we have the same features. We have a
13 declining set of caps. And we have a steadily
14 increasing price signal through a full pricing auction.
15 And the market targets the lowest cost reductions
16 across the entire economy. It doesn't matter where
17 those reductions occur for GHG because they are a
18 global pollutant, not like a local air pollutant.
19 And all of this creates a long-term price
20 signal for investment certainty. So not only is the
21 design of the program important, but also the political
22 support. We have had strong political support through

1 bipartisan actions by our legislature and under both
2 Republican and Democratic governors in the state.
3 Each entity covered by the program has a
4 compliance obligation that is set by GHG emissions, and
5 entities are required to meet that compliance
6 obligation by surrendering allowances or a limited
7 quantity of offsets equal to that compliance
8 obligation.
9 We create all the allowances in the system.
10 We issue offsets based on strict criteria for what
11 qualifies as an offset. And over time, the cap
12 declines, and I have a graphic about that. So, auction
13 mechanism is very important. It helps to establish
14 that steadily increasing price signal and transparency
15 across the economy.
16 The cap-and-trade program is not a program in
17 isolation to California. It's one of the policies
18 under our portfolio approach to addressing climate
19 change. So, we do have other programs. Some of those
20 other programs target the same sectors under the cap-
21 and-trade program. But together, they have shown the
22 success of reducing emissions towards their target.

1 And many of our programs that are in the
2 portfolio are also leveraged for air quality targets
3 under the federal programs and the state-level program.
4 But things that target transportation, fossil
5 combustion are going to deliver both air quality and
6 GHG reductions in the economy.
7 Next slide, please. This slide provides some
8 facts about the program. It is economy-wide but does
9 cover transportation, industry, electricity, import
10 electricity, and again 80 percent of the state's
11 emissions. We cover large emitters, stationary sources
12 over 25,000.
13 There have been high compliance rates with
14 the program, 100 percent or near 100 percent over the
15 last decade. And over the last decade, we've also
16 raised 14 billion that has been invested back into
17 actions through these GHGs in California, with more
18 than 50 percent of those investments going directly to
19 benefit the most impacted communities and most heavily
20 burdened communities by air pollution in the state.
21 And so, we do see the auction revenue as a key part of
22 helping with our vulnerable communities.

1 Next slide, please. This graphic shows the
2 cap in the program. The program started in 2013.
3 However, it wasn't until 2015 when natural gas and
4 transportation fuels were brought under the program.
5 And when we bought in natural gas for residential,
6 commercial, and we bought in transportation fuels, it
7 doubled the size of the program. But even before those
8 had a compliance obligation, we had allowed those
9 entities to participate in auctions so that they could
10 also start planning and hedging for the compliance
11 obligation when they would eventually be in the
12 program.
13 What you see in the shaded parts of the bars
14 is how we distribute those allowances over time. The
15 dark box at the top of the bars are the allowances we
16 take out for the price containment reserves. The
17 yellow is what we put towards our industrial
18 allocations to minimize leakage, and it's an estimate
19 in this graphic.
20 We do have a green portion that is allocated
21 directly to our natural gas and electricity utilities,
22 and that's to benefit and protect ratepayers. And that

1 blue portion that you see there is what goes to
2 auction. So, it's about 45 to 50 percent of the
3 allowances in any given year that are going to auction.
4 Between 2021 and 2030, the caps decline at
5 four percent per year, and that is to reflect our 2030
6 target of a 40 percent reduction from 1990 levels by
7 2030.
8 Next slide, please. It's important to know
9 where this allowance value is going. Like I said, our
10 electric and natural gas utilities do get allowances
11 that are auctioned alongside the allowances that the
12 state auctions. That money is returned back to the
13 utilities. They can use it for rebate programs for
14 efficient appliances, update for solar panels
15 installation programs for homes.
16 And importantly, there is a biannual climate
17 credit on bills that repairs get in the state of
18 California. When the pandemic hit last year, that
19 biannual return was split over two months, to help on
20 two months of bills instead of just one month because
21 we did see the impact of job losses on the shelter-in-
22 place.

1 And so that was one way that we could help
2 mitigate bills in the state of California. And again,
3 50 percent of the money is going directly back into
4 communities.
5 Next slide, please. The program is designed
6 with a series of mechanisms for compliance flexibility.
7 There are a limited amount of allowances that are
8 issued under the caps in the regulation. We do also
9 issue offset credits under very specific protocols that
10 we have adopted.
11 Because the offset credits are subject to a
12 four percent usage limit, there is an infinite amount
13 of offsets that we can issue. We just limit what can
14 be used by any individual entity in the program. There
15 are banking limits which are withholding limits that
16 change each year depending on the size of the overall
17 cap of the program.
18 And there are multi-year compliance periods
19 to help with any annual variability related to hydro,
20 crops, agriculture, et cetera, in the state of
21 California, and things like an economic downturn and a
22 short-term downturn.

1 Next slide, please. So how does the program
2 work? We have a regulation that actually collects the
3 data, which is verified by a third party, and those
4 accredited third-party entities are subject to
5 oversight and enforcement by us. We do believe that
6 that data is critical to the fundamental strength of
7 the program, and it's essentially setting caps and
8 establishing compliance obligations.
9 And so, on our mandatory reporting
10 regulation, we have very high fines that work as
11 deterrents in this reporting or missing your reporting
12 requirements. We have reporting on emissions,
13 production, electricity, sales and purchases, among
14 other data. And everything is reported at the facility
15 level based on electricity imports that are delivered
16 by sources in the state of California.
17 Some emissions, for example, biogenic
18 emissions, are recorded but do not have a compliance
19 obligation. So, we're really talking about the fossil-
20 based emissions. And then one allowance equals one
21 offset credit equals a permit to emit one metric ton of
22 carbon dioxide equivalents.

1 Next slide, please. We do have mechanisms
2 specifically designed to ensure market integrity. This
3 includes, again, purchase limits at auctions for
4 allowances, holding limits for entities that can
5 purchase and hold those allowances, registration and
6 disclosure requirements so that we know who's in the
7 market and if they're related to other players in the
8 market.
9 And if there is a certain level of shared
10 control between entities in the market, they do share
11 those purchasing holding limits. We have a central
12 tracking system called KIT, and there are serious
13 financial penalties for violations for regulatory
14 requirements.
15 It's also worth mentioning that not only do
16 we have the regulated entities in the program, but we
17 also have voluntary participants. So, we can have
18 hedging funds, and we can have banks and brokers
19 participate in the program. And they all have to
20 disclose a similar amount of detail and information
21 about their organization.
22 We have seen some relationship with FERC and

1 CFTC in the past. We had a fair amount of engagement
2 with our colleagues at the federal level at the early
3 stages of designing the program. There was that period
4 of lapse, and we're happy to start to reengage with
5 those agencies and with the CFTC in particular.
6 We have enforcement abilities within the
7 agency, but we also coordinate with our Department of
8 Justice. And in writing the regulation, we were very
9 closely working with our Department of Justice
10 restructuring things related to fuels and energy.
11 Next slide, please. There is a mechanism
12 that has been part of the program since the very
13 beginning, and what this mechanism does is ratchet out
14 allowances if there's low demand at any given auction.
15 And so, if we have an auction where not all
16 the allowances sell, those allowances are removed and
17 no longer brought back to auction, and so we have two
18 consecutive auctions that clear above the auction
19 reserve price. And that reserve price is going up five
20 percent plus inflation each year. And it's usually
21 about six to seven percent.
22 Previously unsold allowances are slowly

1 returned to the market. If that demand returns at the
2 auction, the maximum number of unsold allowances that
3 can come back is about 25 percent of what is offered in
4 total, so that we just don't put a glut of allowances
5 back into the market.
6 And then allowances that remain unsold for 24
7 months are permanently removed and placed into our
8 price containment reserve. This mechanism has removed
9 40 million allowances in the program so far.
10 So, it has been shown to work and has been
11 triggered during 2016 and '17 when we had a period of
12 political uncertainty. But once that political
13 uncertainty was settled through new legislation, with
14 bipartisan support, we saw that folks become more
15 confident in the longevity of the market and continue
16 to reinvest back into the market.
17 Next slide, please. There are a fair amount
18 of secondary market activities that we track or engage
19 in. We do have our own dedicated market monitoring
20 section that provides direct program oversight. We
21 also have an independent market monitor that performs
22 analyses of the auctions similar to what RGGI has. We

1 have data that we get from the commodity exchanges that
2 we look at for price transparency.
3 And I'll show a graph in a little bit. That
4 helps -- that will explain that a little bit further.
5 We have access to reporting services. And then we have
6 a fair amount of detail that must be put into the
7 system when you under -- when you actually engage in a
8 trade of instruments between accounts in our system.
9 And that includes the number and types of
10 instruments, the agreement date, the price paid,
11 currency type. And at any time, we can call in all
12 contracts related to any transfer within the system.
13 We have used that mechanism to better understand things
14 that didn't look quite what we're expecting to see, and
15 it has resulted in some enforcement actions levied
16 within the program.
17 We also put up quarterly and annual market
18 transfer reports. So that we, in addition to the
19 secondary market report, are providing some information
20 on what we're seeing on prices and transfers.
21 Next slide, please. So, this graphic shows a
22 couple of things. What you have there in the gray line

1 is the auction reserve price, and then the green
2 triangles indicate the clearing prices that are
3 auctioned, and then that blue line is the secondary
4 market prices. The green diamonds never go below the
5 full price of the gray lines because we do not sell
6 allowances under that reserve price at any auction.
7 But we have seen periods where the secondary
8 market prices did fall just below the reserve price of
9 the year in our program. I mentioned some political
10 uncertainty in '16 and '17, so that's where you see
11 that initial few periods where the blue line, the
12 secondary market is below auction reserve price.
13 And then most notably is early or spring of
14 2020 when we saw all financial markets start to see
15 huge sell-off, and that also impacted our market, not
16 in the sense that our prices at the auctions dropped
17 but that interest in the auctions dropped because
18 people in the secondary markets were liquidating
19 allowances that they were holding.
20 And so, going into any given auction, we will
21 look at this data to understand if we're seeing
22 patterns that could give some indication of what to

1 expect at an auction. We never share that as the
2 administrator of the market, but it is something that
3 we look at. And we know that it's a product available
4 to some of the entities out there by third-party
5 providers.
6 Next slide, please. And then finally, I do
7 want to flag that, you know, we are linked with Quebec
8 carbon market. In order to be linked with the market,
9 we have the same market rules, including the unsold
10 allowance mechanism. We have mutual recognition of
11 each other's issued allowances and offsets. And there
12 are no limits on the origin of compliance instruments
13 used for compliance.
14 And in fact, if you're a market participant,
15 you can't tell whether you're trading a Quebec or
16 California allowances in the system. All of this
17 program is helped administered through the Western
18 Climate Initiative, Inc. It is a nonprofit, and it
19 provides the administrative services to run the linked
20 programs. That includes the single registry system,
21 the same auction platform, and market monitor services.
22 We have been linked with Quebec since 2013,

1 and we've had linked auctions with them since that time
2 as well. We were linked with Ontario, Canada, for a
3 little bit, but then they had a change in provincial
4 government. And they were in for about a year and then
5 out for about a year.
6 But what was really telling about the design
7 of the California-Quebec market is we've weathered
8 that. We didn't see pronounced changes in prices or
9 mass exiting of the market, and that really helped to
10 show the resiliency of the design of the program to
11 weather those kinds of actions.
12 And the next slide, please. Some additional
13 resources if you want to read up more on our program.
14 And I look forward to the conversations with the
15 Commissioners after all the panelists are completed.
16 And thank you to the CFTC staff for helping to manage
17 the logistics for today. Thank you.
18 CHAIR WIGGINS: Thank you very much. We'll
19 turn this over now to Hans and Gordon.
20 MR. BERGMAN: Okay, hello. So, I'll start.
21 And you hear me, I hope? Okay.
22 CHAIR WIGGINS: Yes.

1 MR. BERGMAN: So, if I can get my slides.
2 First of all, thanks a lot to -- for welcoming us from
3 Europe to participate at your event. It's very
4 positive that we have these increased exchanges across
5 the Atlantic and especially in this important area of
6 climate change.
7 So, I will speak a bit about the system as it
8 is, and then I will speak a bit -- with slides. And
9 then I will speak a bit without slides on -- a little
10 bit more on this financial aspect.
11 So, if I can have the next slide, please.
12 First, a few words about Europe because maybe some of
13 you don't exactly know how it works. So European Union
14 has 27 member states. It's around 450 million people,
15 and we were -- we are working together to have free
16 trade, free movement of people and labor, et cetera.
17 And we have a lot of common legislation in a large
18 number of areas, and our laws are normally called
19 directives and regulations.
20 The European Commission where I work, which
21 is often called the Commission, is the executive
22 branch. So, we propose legislation, and then we have

1 two co-legislators, which is the European Parliament
2 and the Council, we call it, which is the sort of group
3 of the national governments of the 27 member states.
4 And when the two agree on the legislation, it's our job
5 to implement it.
6 Next slide, please. So, in this European
7 Commission, we have many departments. We have one on
8 climate change, and that's where I work, the EU ETS.
9 So, the EU climate policy has been around since now
10 about 20 years. So, we have currently a target -- a
11 common EU target to reduce emissions by 55 percent
12 compared to 1990.
13 This is a very new target, only a few months
14 old. And current legislation is based on a 40 percent
15 reduction. So, we are currently right now very
16 actively working on preparing new legislation to step
17 up these 15 percentage points in this 10-year period
18 that already started. So, it's quite a challenge both
19 work-wise and fund-wise.
20 We have divided the carbon emissions into two
21 groups basically. They're half and half each, and both
22 are capped basically by economic instruments. And the

one group, which I talk about mainly, is large sources, the power plants, and the big industry. It's covered with one common cap for the whole of EU, which would decline over time. And that's the EU ETS, Emissions Trading System.

And then all other emissions, which is capped member state by member state. And there's quite a big difference in reduction targets depending if they are richer or poorer member states. But also, there is limits on allowances on the member state countries between each other if one overachieves and another underachieves.

Next slide, please. So, EU ETS was put into place in 2005. First there was an attempt to set out the EU carbon tax, but it didn't work, so then we went to the cap-and-trade emissions trading. And it applies to around 11,000 installations, as I said, mainly the power sector and heavy industry. It has covered the EU 27 member states plus three more countries. It's Norway, Iceland, and Liechtenstein, which are part of the European economic area.

So, it's now around 40 percent of the EU

1 emissions. It was more than 50 percent when we
2 started, but the emissions have gone down faster in our
3 emission in the ETS area than the other areas which is
4 road transport and building heating emissions, which is
5 more difficult to reduce.
6 So, like the other colleague said
7 (indiscernible 01:12:17), on the one hand it cuts
8 emission and set a declining trajectory to ensure that
9 they meet our climate targets in a cost-effective
10 manner, but efficiency is very important, and it sets
11 carbon price to incentivize low-carbon investments.
12 So, they have now arranged a fourth phase.
13 The first phase was three years but more of a test
14 phase, which when it ended, the allowances were
15 worthless. But since 2008, the allowances are a kind
16 of a permanent currency, which can be banked into the
17 future system. And this has created stability but also
18 some problems because we have to had the economic
19 crisis, for example, in 2009, where it led to some
20 concerns. I will come back to that. But we have since
21 January this year embarked on phase four of the EU ETS.
22 Next slide, please. So, like it was also

1 mentioned by our previous speakers around -- the ETS
2 generates a lot of revenues, and they have now in the
3 order of 50 billion U.S. dollars generated since 2012.
4 And when we see the price we will understand why the
5 large chunk of this amount comes now in the last few
6 years. So last year, we were over €17 billion only in
7 one year.
8 And member states use around 70 percent of
9 this revenue to tackle climate change, and it's also
10 used to finance innovation. And another thing, which
11 is perhaps more specifically EU than US, is that we
12 also have -- seem to have one common system for the
13 whole EU despite the very big difference in, let's say,
14 GDP per capita between the richer-income member states
15 and the lower-income member states.
16 It's quite an important solidarity element
17 where part of the revenues are transferred from the
18 richer member states to the poorer. We also have quite
19 large special funds to support modernization of the --
20 main energy sector in the low-income member states,
21 which often also are more dependent on coal. And we
22 all know their histories, that they're having more

1 issues to deal with.

2 Next slide, please. So, a little bit more in

3 detail. So, one ton of CO_2 is one allowance. And then

4 we have them of course the amount of allowances to be

5 issued every year is fixed in legislation. It's one of

6 the most important things that the legislators decide.

7 It was rather rigid in the beginning, but

8 since -- and that created some problems. For example,

9 the economic crisis, when the supply was kind of fixed,

10 but the demand went down very fast.

11 But in 2019, we have a new instrument in

12 place, which we call the market stability reserve,

13 which basically removes allowances from auctioning

14 until we reach a better balance in the market. And it

15 can also work the other way around. If there's a

16 shortage of allowances in the system, it can grow from

17 reserving out in the market.

18 We have most of the allowances sold on daily

19 auctions. So, in fact, we have all different products,

20 they have them very frequently, basically every day, on

21 the platform EEX, and the revenues are provided to the

22 member states. So, like a typical day generates around

1 180 million U.S. dollars, so quite a lot of money.
2 Then another around 43 percent of allowances
3 are allocated for free to the energy-intensive
4 industries to handle their competitiveness issues. But
5 there is a system where only the most efficient
6 facilities get what they need, more or less. And if
7 you're (indiscernible 01:16:13), for example, you only
8 get half of the allowances you need. So, it's a system
9 that favors the most efficient installations in terms
10 of greenhouse gas efficiency.
11 And the power producers receive no free
12 allocation. So, they are the big buyers on the
13 auctions.
14 Next slide, please. And it is imperative
15 that they can pass on the cost to their consumers
16 because then there's international competition. So,
17 our compliance system is that by the end of March every
18 year, each facility operator has to report emissions,
19 which of course have to be verified.
20 And then by the end of April, one month
21 later, this is around the time they have to surrender
22 the amount of allowances equivalent to emissions. And

1 we have very high fines for noncompliance. So, we have
2 a compliance rate of about 99 percent. So, the
3 instrument is very, very well followed.
4 Next, please. So here, it's basically
5 showing the cap between the (indiscernible 01:17:13)
6 the cap as it has been decided. In 2014, '15, '16, we
7 did some temporary reductions of the auctioning because
8 we had a big surplus. And then also that yellow part,
9 that never came to the market. And again, from 2019,
10 they have this amount in yellow which never came to the
11 market although that was originally intended, and this
12 is this new market stability reserve.

13 And you can see it has quite a big impact
14 since the rest of the green there, about half is being
15 given off (indiscernible 01:17:52). So, the amount of
16 auction is very significantly reduced. And this system
17 will continue so we've already calculated it ahead of
18 time, how it is in fact supply.
19 And the line that shows the emissions, and it
20 has been down quite a lot. In fact, 13.3 percent
21 because it was the COVID year, but the year before it
22 was also around nine percent average. The power sector

1 is just almost 15 percent. So, for them, it's very
2 much a matter of switching from coal to gas and gas to
3 renewable. That was a big impact. But we also see
4 industry is now making more and more efforts.
5 Next slide, please. So, this is our price
6 scale. It's a bit more dramatic than what I've seen
7 before. And you can see just now this is almost
8 touching 60. This is euros, so you should multiply it
9 by 20 percent or by 1.2 to get U.S. dollars. So, we
10 are now around €50, which is around $60. And, of
11 course this is basically a bit of a concern on the
12 market and why it is happening right now, et cetera.
13 But what is quite clear in our view, or from
14 the market analyst, is that earlier this year or late
15 last year, there was this announcement that we should
16 go from 40 to 55 percent reduction in 2030. And that
17 means also the amount of allowances coming out to the
18 market for ETS will also reduce.
19 It took some time for the market to realize
20 it, but suddenly everybody started to believe in this,
21 and then the prices started to skyrocket. And now, we
22 are a bit down again, as I said, under 50, so let's see

1 where it stays. But it's become a very interesting
2 market.
3 Next slide. But you can see in the past we
4 had a lot of ground, around five years or for many
5 years, so we had some difficulties to let this market
6 go, also to generate the incentive for reinvestment
7 that we also want.
8 Next slide, please. So, as I said, we update
9 our legislation, and we will also look at the
10 possibility to introduce an emissions trading for
11 emissions for building heating and road transport and
12 also maritime transport. But the legislative proposal
13 will come on the 14th of July, so very soon.
14 So that's the end of my overall presentation.
15 Then I thought, if I may, just say a little bit more
16 about the financial aspects since this is also what you
17 are a specialist in. So according to the European --
18 we have the European Securities and Market Authority,
19 which is another association above the national
20 authorities. They have calculated that the value of
21 the market in the EU is around €840 billion per year,
22 so it's slightly up for us at least.

1 A very large part of this is the derivative
2 markets, and most of it got traded on exchanges, a
3 little bit also on over-the-counter.
4 In our view, derivatives are useful because
5 they help the ETS operate as the industry and the power
6 sector to make contracts where they don't have to put
7 up so much cash, but they can get the certainty that
8 they can buy -- get their allowances in time for the
9 compliance and pay at that time. So, this, you all
10 know how this works.
11 And then the contracts are offered by
12 exchanges and financial firms, which are free to offer
13 the products and develop their business within the
14 limits of the regulatory framework. So far, most of
15 these secondary markets took place in ICE Futures
16 Europe in London. I'm sure Mr. Bennett will talk more
17 about this later. Please also note it will move to the
18 Netherlands very, very soon due to Brexit presumably.
19 And when it comes to the oversight, like my
20 colleague said, it's very important to keep now since
21 we have such a big financial instrument to have a safe
22 and efficient trading environment to keep credibility

1 for the ETS, both as a climate instrument but also a
2 financial instrument.
3 So, the derivatives of the emissions
4 allowances were classified as financial instruments
5 from the beginning in 2005 and in 2018 also spot
6 allowances were on the list of financial instruments.
7 So basically, now all parts of European
8 carbon market are subject to the same regime,
9 applicable to the EU financial markets. And they have
10 this legislation in all the markets and financial
11 instruments and market abuse regulation and anti-money
12 laundering directive.
13 So maybe I will not go into all the details.
14 I can send some within the statement later. But
15 basically, we have regulation supervision of the
16 auction platforms on the secondary market trading
17 venues. We have regulation of the financial
18 intermediaries and rules to prevent auction market
19 abuse. For example, market manipulations insider
20 dealing, unlawful disclosure of nonpublic information,
21 and also, of course, against money laundering and
22 terrorist financing. So, all of this is one

1 legislation.

2 We also have rules about transparency and

3 position reporting. So, on a daily basis, this has to

4 be reported to the authorities. And also, every week

5 it has to be given in a bit more detail so that we can

6 follow up if something strange is happening on the

7 market.

8 Finally, on the cooperation between competent

9 authorities. So, in the EU, they have 27 national

10 authorities and then the European one. And they also

11 can exchange information with countries outside of the

12 EU. So, the national authorities are members of the

13 National Association of Securities Commissions. And

14 they also cooperate with the SEC and the CFTC and --

15 yeah. So, the transactions in addition to allowances

16 can happen both in the EU and outside of the EU. It's

17 important to have a good cooperation in place between

18 the relevant authorities.

19 Following the increased interest in carbon

20 trading because of this increased price, they have some

21 entities that might be associated with speculation.

22 That also includes the interest in the carbon markets.

1 So, although the information that we have on
2 total open positions showed that we hold the relatively
3 small side of the market, it's important to follow this
4 development. And the political pressure on us includes
5 also to kind of do something about it. But so far, we
6 are keeping -- thinking that this market is healthy as
7 it is.
8 We also look forward to having more
9 cooperation with the U.S. So, thank you very much.
10 CHAIR WIGGINS: Thank you. Gordon?
11 MR. BENNETT: Hi there. Good morning and
12 thank you for the opportunity to present on not one but
13 two panels today. I feel honored.
14 My name is Gordon Bennett. I'm the Managing
15 Director of Utility Markets at ICE, which means I'm
16 responsible for ICE's natural gas and electricity
17 portfolio outside of North America, gathered with our
18 global portfolio, and most importantly for the purpose
19 of today, our global environmental portfolio.
20 In today's first panel I'm clearly the odd
21 one out, as the previous presenters are all important
22 policymakers for cap-and-trade programs whereas I

1 represent an operator of a network of financial
2 markets. However, I'm more than happy to provide an
3 overview of ICE's newest market in carbon cap-and-
4 trade, which is the UK allowance.
5 But before I do provide some details on the
6 UK ETS, I would like to briefly introduce some macro
7 themes around finance and the energy transition, and in
8 particular, carbonomics.
9 Arguably, the UK is part of and along with
10 the EU witnessed the birth of carbonomics 15 years ago
11 with the introduction of the EU ETS in 2005.
12 If we could go to the next -- yes, one more
13 slide, please. So, the purpose of financial markets is
14 to allocate capital and manage risk. And valuation is
15 at the core of this. If I go back to my accountancy
16 roots, there's a three-tiered fair value hierarchy with
17 quoted markets sitting at the top, such as ICE's New
18 York Stock Exchange equity markets, and ICE's
19 derivatives exchanges.
20 Why do they sit at the top of the scale of
21 the fair value hierarchy? It’s because these prices
22 are executable and can transfer risk, and therefore the

1 most precise form of valuation.
2 This risk management function is integral to
3 the growth of the new economy because we allow
4 corporates smooth their earnings and importantly
5 provide access to more forms of capital and cheaper
6 forms of capital.
7 So, we're now entering an era of sustainable
8 finance with different valuation methodologies and
9 required value externalities such as pollution. This
10 is the era of carbonomics.
11 Next slide, please. The energy transition,
12 or the latest energy transition because energy's been
13 transitioning since the dawn of civilization, is
14 changing the current merit order of energy use to meet
15 the goals of the Paris Agreement.
16 We use energy for heating and cooling,
17 electricity, mobility, and as feedstock for products.
18 In order to meet the goals of the Paris Agreement, the
19 fuel merit order will need to adapt towards less
20 carbon-intensive energy. And one of the keys to
21 enabling this transition is the application of
22 carbonomics.

1 Next slide, please. And so here we come to
2 the UK, and in particular, the UK electricity sector.
3 As Hans said in his presentation, the electricity
4 market does not get any free allocation, and so the UK
5 electricity and the European electricity sector have
6 been living with carbonomics for 15 years now, and so
7 it's the best example of carbonomics in practice.
8 So, the application of carbon pricing through
9 cap-and-trade programs, and in the UK's case with some
10 unilateral policy support, has successfully removed
11 coal from merit order of electricity generation.
12 The application of carbon pricing effectively
13 addresses the green premium issues that Bill Gates
14 refers to in his book *How to Avoid a Climate Disaster*.
15 Carbon pricing erodes the green premiums.
16 And so, let me refer to the electricity
17 generation sector under traditional economic model, the
18 gross profit margin of a coal-fired power station which
19 is referred to as the dark spreads is higher than the
20 gross profit margin of a natural gas-fired power
21 station referred to as the spark spread. And so, coal
22 is the highest in the merit order based on a

1 traditional economic model.

2 However, if we apply the cost of carbon at

3 COVID prices, carbon-intensive natural gas -- natural

4 gas, pardon me, carbonomics changes the merit order so

5 that natural gas is more profitable. It is called the

6 clean spark spread, and it appears higher in the merit

7 order than the clean dark spread.

8 And in this graph, you can see the line at

9 the bottom is the clean dark spread. And it's

10 important to know not only is coal less profitable, it

11 was actually loss-making. So, whenever you make a

12 megawatt of electricity produced, you're losing money.

13 And therefore, this moves coal out of the merit order.

14 It is important to note that carbon pricing

15 doesn't work on its own. So, when I refer to dark

16 spread and spark spread, the values of the other parts

17 of the equation are important to generate the desired

18 outcome. So, whatever your view is on different types

19 of fuels and carbon content, knowing the value of these

20 fuels is integral to carbonomics.

21 Next slide, please. And this is the outcome.

22 This is the electricity generation by fuel source since

1 1998. And effectively, today is -- coal is all but
2 removed from the electricity generation merit order in
3 the UK.
4 Next slide, please. So, the next slide shows
5 the transition that has been made in the UK over the
6 last decade, which has now resulted in emissions being
7 reduced by approximately 40 percent from 1990 levels.
8 You're now looking to see how this further develops in
9 the future and under the UK ETS rather than the EU ETS.
10 Next slide, please. And one more, please.
11 So, the UK ETS, this should be relatively brief because
12 we're really at the very beginning of this program.
13 Now, that came into force at the beginning of this
14 year. The first auction and the opening of the
15 secondary market was actually only two weeks ago. So,
16 we're witnessing the birth of the UK ETS.
17 So, my objective is really twofold: to
18 benchmark the UK ETS versus the other cap-and-trade
19 programs that the panelists have discussed before me,
20 and to give some insight into how the commencement of
21 trading has behaved since the 19th of May.
22 Next slide, please -- oh, sorry, yeah. So,

1 the UK ETS is very much a lookalike of the EU ETS.
2 There are some minor differences in the operation of
3 the auction. So, the UK auction actually looks a bit
4 more like California and RGGI, as there is an auction
5 sale price. It's £22. And the auction can clear with
6 partial allocations.
7 There are some minor differences between the
8 UK and EU ETS, but they're largely the same. There are
9 also -- there's a little bit of difference in cost
10 containment measures in the first two years for the UK
11 ETS. But after the third year, I believe these align
12 also with the EU ETS.
13 So, the slide shows the current cap as the
14 greenhouse gas emissions trading scheme order of 2020
15 in the dark teal. And then in the light teal, we have
16 the provisional emissions for 2020. However, it's
17 important to note that the cap here is before the
18 recent government announcement to reduce emissions to
19 78 percent of 1990 levels by 2035.
20 And so, there is going to be a cap
21 consultation due later this year. The government
22 indicated that it would consult on the cap's trajectory

1 within nine months of the National Climate Change
2 Committee's advice on cost-effective pathway to net-
3 zero emissions. This advice was published in December
4 of 2020 and included recommended levels of emissions
5 recovered sectors to be 106 million tons in 2022 and 61
6 million tons in 2030, and those are shown in the red
7 lines in the graph.
8 Next slide, please. What does the UK ETS
9 look like versus the other cap-and-trade programs? No
10 surprise, really, that the EU, given that it's covering
11 30 countries, is by far the largest in terms of
12 installations. The UK does, however, rank second in
13 installations and also in terms of the cap.
14 California is the most ambitious in terms of
15 emissions covered, so they -- we saw earlier that 80
16 percent of emissions are covered under the California
17 program. And this is really driven by the inclusion of
18 transportation and heating fuels where the EU and the
19 UK is focused on electricity generation and heavy
20 industry. And as spoken earlier, RGGI is solely on
21 electricity generation.
22 And the bottom graph on the right-hand side

1 shows the cost of carbon. And the UK is leading in
2 terms of the cost of carbon at nearly $70 per ton.
3 Next slide, please. So how are the auctions
4 with secondary market performed in the first two
5 auctions? The auction performance has shown very
6 strong cover ratios, and the first two auctions have
7 raised over half a billion pounds for the UK
8 government. The secondary market is approximately 500
9 lots a day or 500,000 tons.
10 In the graph that's showing how the UKA
11 benchmarks against the other cap-and-trade programs we
12 operate. The top row shows on a lot basis and the
13 bottom row is on a notional basis. As the EUA is
14 clearly the largest, I've also stripped out the EU
15 numbers on the right-hand column to get a better
16 comparison of the relative size of California and RGGI
17 and UKA together.
18 So, the UKA at 500 lots a day is about half
19 the size of RGGI on an annual moving average basis.
20 But in terms of notional value, it has already
21 overtaken RGGI. The UK ADV would need to rise to
22 approximately 2,000 lots a day to become the second

1 largest cap-and-trade program by notional value,
2 overtaking California.
3 In the two weeks since we have operated,
4 however, if you compare RGGI ADV and the UK ADV, they
5 are both coming in at around the 500 lot ADV mark. So,
6 they're quite similar in cap sizes, but also quite
7 similar in ADVs currently as well.
8 Next slide, please. This just shows the
9 daily breakdown for this launch and the growth of the
10 open interest. And I can report as of this morning,
11 the open interest is reaching nearly 3,000 lots or
12 three million tons.
13 And then lastly, next slide, please. Our
14 last slide shows how emissions have been reduced in the
15 UK since 2010, showing the emission reduction has
16 largely been targeted at the fuel combustion sector,
17 electricity generation. As per the earlier slide, the
18 UK has already transitioned away from coal to natural
19 gas and electricity generation.
20 And so, the UK ETS is really a test of policy
21 for post-coal to gas switching. So, it's going to be
22 very interesting to see how policy develops in the UK

1 carbon cap-and-trade market because it moves easier
2 when in the electricity generation fuel sector have
3 largely been one now.
4 So how is electricity generation going to
5 continue to decarbonize, and how will the industrial
6 sector have largely been allowed to get the allocation?
7 How does the industrial sector going to start to
8 decarbonize more under the UK ETS program?
9 And then finally, what happens with those
10 sectors not covered by the cap-and-trade program? Will
11 we see more ambition in terms of -- a bit more like
12 California in also addressing heating fuels and
13 transportation fuels? Thank you very much.
14 (Brief Pause.)
15 CHAIR WIGGINS: I may have been on mute
16 there. Let me try this again.
17 I'm going to open the floor now to questions
18 and comments from the Associate Members on the prepared
19 remarks. And Abigail, I think we have one question in
20 the queue from Paul Cicio; is that correct?
21 MS. KNAUFF: Yes, that is correct. Thank
22 you.

1 CHAIR WIGGINS: Okay, thank you. Paul,
2 please go ahead.
3 MR. CICIO: Sure. Hey, thank you very much.
4 I can't think of anything more important than
5 addressing climate and succeeding to reduce greenhouse
6 gas emissions domestically and internationally. So,
7 this is an extremely timely target.
8 As a reminder, though, my organization
9 represents energy-intensive, trade-exposed companies.
10 These are steel, aluminum, cement, chemicals, plastics,
11 glass, paper, food processing. And these industries in
12 the United States consume about 80 percent of all the
13 energy of the entire U.S. manufacturing sector.
14 And the manufacturing sector in the United
15 States is very large. We are 11 percent of GDP, and we
16 employ around 13 million really well-paying jobs. So,
17 my primary comment here is from -- this assumes a
18 carbon tax will be placed on domestic industries such
19 as mine. And we are unique in that we do compete with
20 the likes of producers of these products from places
21 like China.
22 And in fact, our carbon footprint is a lot

1 less for our output than China by quite a large major.
2 So, if we're going to talk about carbon pricing, we
3 have to talk about a border adjustment because without
4 a border adjustment provision, then these
5 manufacturers, these energy-intensive manufacturers
6 will shift their production offshore. That's called
7 greenhouse gas leakage.
8 So, you shift these greenhouse gas emissions
9 offshore without -- and the jobs for that matter. And
10 we don't want that. Nobody wants that. And so, one of
11 the things I would recommend, Mr. Chairman, is for
12 maybe the next commission advisory committee is that we
13 have a session on border adjustment.
14 To finalize my comment before I ask a
15 question is, border adjustment may sound easy, but it's
16 not. A border adjustment requires our competitors in
17 foreign countries like China to third-party validate
18 the embodied carbon in the product that they import
19 into the United States. Getting them to do that is
20 hard. You have to have country -- that country support
21 to enforce that third-party validation.
22 And as we all know, the weak spot of the

1 Paris climate accord is enforcement. So, this gets --
2 kind of really gets to the heart of it. If we're going
3 to do it, we have to do it right and not gloss over
4 this very important issue of greenhouse gas leakage.
5 We need manufacturing jobs. In fact, we need
6 more manufacturing to produce the products for the
7 clean evolution going forward.
8 So, my question to the EU, especially, is we
9 understand that there are efforts on the part of the EU
10 to establish a border adjustment provision, and I'd
11 like to hear from that. Thank you.
12 MR. BERGMAN: Am I supposed to reply now, or?
13 CHAIR WIGGINS: Yes, please go ahead.
14 MR. BERGMAN: Okay. Thank you for that
15 question. Yes, well, just take one step back. When
16 the EU ETS was created from the very start, the
17 competitiveness of the energy-intensive industries was,
18 of course, a key issue to deal with. And therefore, we
19 all looked from the start to better the system with
20 pre-allocation to industry so that they would get most
21 of their costs covered by this pre-allocation but still
22 have a marginal cost increase, an initial marginal

1 benefit for reducing emissions.
2 In the beginning, the system was a bit crude
3 and it was more based on past historical emissions.
4 So, the more a facility emitted, the more of a pre-
5 allocation they got. Then it changed from 2013 to this
6 benchmark-based system, as I said, so basically, the
7 most efficient installation gets more or less what they
8 need in a certain sector.
9 They have around 50 different products
10 benchmarks. So, for example, we can see that kind of
11 certain chemicals, something gets this amount of
12 allowances. And then if you emit more, you have to buy
13 the rest.
14 Because we're quite fine so far -- I mean, we
15 haven't seen much of this carbon leakage, which is
16 indeed a problem because if we move emissions abroad,
17 then we didn't gain anything, and we lost jobs on the
18 way, as you say. Now with increased ambition, and it
19 has been announced to increase carbon prices, there has
20 been a political statement that we should even more
21 think about this issue. And the carbon border
22 adjustment mechanism, as we call it, has been promised

1 to be part of the proposal on the 14th of July.
2 And so you can imagine it's a little bit
3 difficult for me to go into details because it's one of
4 the issues that is being discussed, I think, until the
5 last day, and that's the 14th of July, how that exactly
6 will look like. But in the -- it's because of ETS that
7 there is this potential competitiveness problem, so
8 that will be somehow the link to it…
9 Then we have the issue, as we all know, it's
10 very difficult to get -- how to motivate from -- also
11 the rest of the world and possibly political issues, et
12 cetera. There are many issues to deal with. And I
13 think it's a bit difficult for me to go into more
14 details and I've -- you have to be a bit patient until
15 the 14th of July. Hopefully that day we will have a
16 proposal. And that can be studied, and surely very
17 much discussed.
18 The good thing, I think, about this is that
19 many countries around the world have been contacting us
20 and the European Commission and say, "How can -- what
21 do we have to do to not be covered by this broad
22 adjustment for our industry?" So, it's put a little

1 bit of speed behind some slow-acting countries. But
2 nevertheless, it will not come without any bilateral
3 discussions, for sure.
4 But until then, we will continue this pre-
5 allocation. I understand this is what also our
6 colleagues are using often. Thank you.
7 CHAIR WIGGINS: I believe Matt Picardi has a
8 question. Matt, please go ahead.
9 MR. PICARDI: Yes, thank you. Thank you,
10 Dena. Quick question for Hans and Gordon. In the
11 U.S., I would say that we -- our carbon emissions
12 programs that are market-based ones that have been
13 developed so far, focus on, you know, compliance and
14 efforts to reduce emissions of sources. And they're
15 run in conjunction with programs, such as renewable
16 portfolio standard programs or state-type programs that
17 provide incentives for the development of renewable
18 resources.
19 I was just curious, what -- how big a role do
20 the carbon markets that exist in the EU play in
21 supporting the development of renewable resources at
22 this point in time?

1 MR. BERGMAN: And maybe I can start, if you
2 want. Okay, I think when the renewable power
3 production mainly was in its infancy, it took away the
4 huge reversal of industry 100 years of the -- within
5 the sector. There was a lot of, let's say, state
6 support for that. And that's when ETS was coming more
7 and more, the need for, let's say, subsidies has nearly
8 vanished, I would say, for the most of the renewable
9 electricity, the more (indiscernible 01:47:44)
10 standard. And the carbon price creates that incentive
11 by itself. So now, we have to be -- and member states
12 more give support is what we call more -- yeah, newer
13 technology, renewable energy, and also say
14 infrastructure, et cetera, while --
15 So, it's -- certainly, the carbon pricing has
16 very much helped in the power sector. And I think that
17 was what Mr. Bennett just showed with his slides.
18 Maybe we can show it. But we have the subsidy schemes
19 that were created for the renewable energy are
20 sometimes, you know -- of course, some are given for
21 ten years or so, so some of the producers are now
22 probably getting quite a bit of benefits because they

1 have the low cost because of the subsidies because it
2 was thought to be very expensive. And now, they
3 increased the prices, somehow going after this because
4 of the ETS, and that gives an extra benefit to this
5 renewable electricity, which has basically zero costs -
6 - operating costs. But maybe Gordon Bennett can
7 illuminate.
8 MR. BENNETT: I would agree with all of that.
9 You know, in the beginning, when renewables were more
10 expensive, then there were certain incentives in place,
11 whether these were feed-in tariffs to de-risk renewable
12 investments. And those were complemented by the carbon
13 pricing.
14 But as Hans said, now, we live in a world
15 where really renewables is emergent, and we don't
16 really need the feed-in tariffs or tax incentives in
17 it, and coal has been -- coal has come out of the merit
18 order. And increasingly, renewables has come into the
19 merit order because of -- solely because of carbon
20 pricing.
21 I think that the question is now, you know,
22 what policy support is required for the -- for whatever

1 the next renewables are going to be? So, whether that
2 be hydrogen or carbon capture, because as I said in my
3 presentation, that was sort of the -- that that first
4 win of coal to natural gas, which has largely been done
5 in the UK, and it's increasingly being done in the EU,
6 so how does hydrogen and things like carbon capture get
7 into the merit order? Is it solely through carbon
8 pricing, or is that also going to require some sort of
9 incentive policy interventions and incentivization to
10 de-risk the investment required in these markets?
11 CHAIR WIGGINS: I think we have one more
12 question from Sean Cota. Sean?
13 MR. COTA: Good morning. Can you hear me,
14 Dena?
15 CHAIR WIGGINS: Yes.
16 MR. COTA: Thank you. I have a couple of
17 questions. One is for Jena -- Rajinder from carbon --
18 I apologize if I've mispronounced your name.
19 In a CARB allocation system like California -
20 - that California has developed, is that workable in a
21 regional setting, like has been proposed in the
22 Northeast with New York and expanding, and how would

1 they handle leakages? So that's one question.
2 For Gordon, how does the UK measure carbon
3 with the ICE program? Is it everything, abiogenic and
4 biogenic emissions? And how do they allocate that?
5 Thank you.
6 MS. SAHOTA: Hi, and you got my name right at
7 the end, so no apologies needed there.
8 For the allocation system in California, it's
9 important to recognize the role of allocation to the
10 players in the market. And we give it to energy-
11 intensive, trade-exposed companies. So, it's really
12 manufacturing. It's not a transportation fuel
13 supplier. It's not electricity generation plants,
14 because they are able to pass the cost of compliance in
15 the market on to consumers.
16 And so, in California, we have a unique
17 situation with our transportation fuels, that it's kind
18 of an isolated market, because the specs for our fuel
19 to address air quality issues. And on the electricity
20 markets, we've been pushing on renewables for a very
21 long time. And we've actually pushed out coal over the
22 last ten years, almost entirely out of our portfolio in

1 the state.
2 So, when I think about the regional programs,
3 such as the Transportation Climate Initiative, and
4 we're talking about transportation fuels, we would not
5 give transportation fuel free allowances. And so, if
6 the TCI decided that that was something that they
7 wanted to do, then a new methodology would have to be
8 developed for that. Like, what is the basis, what is
9 the potential for leakage?
10 And people are going to go buy gasoline.
11 It's not like people are going to stop selling it
12 because there's going to remain a demand for it until
13 there's an alternative for it. So, the potential for
14 leakage is very low in those sectors.
15 With the industry, we have a process that we
16 look at global markets, global trade exposure, and
17 regional trade exposure to understand how much we need
18 to, quote-unquote, "protect the industry from leakage."
19 And that process has been modeled after work that was
20 done in Australia, work that was done in the EU ETS.
21 And so, there are some very basic features
22 and all allocations schemes for industry that you'll

1 find a program to program with little tweaks here and
2 there for that specific region of the world. I hope
3 that helps.
4 CHAIR WIGGINS: Sean, did you have another
5 question?
6 MR. BENNETT: Hi there, Sean. I think he had
7 a question for me. The cap-and-trade program only
8 covers electricity generation and heavy industries.
9 So, agriculture and land use don't come under the cap-
10 and-trade program, but those emissions are counted.
11 So, UK's emissions include agriculture and
12 land use, but they're not covered under the cap-and-
13 trade program. And I'm not sure if any cap-and-trade
14 programs cover those markets. Thank you.
15 CHAIR WIGGINS: Okay. I believe that Dr.
16 Sandor has a comment and a question. Dr. Sandor,
17 please proceed.
18 DR. SANDOR: Thank you. I'm, Dena,700 years
19 old, so I couldn't be more pleased to have some
20 comments. It's hard to believe, but watching this from
21 Geneva 30 years ago, going into the Rio Summit when
22 people would say, "Oh carbon markets will never work.

1 They're silly. If price is not important, they'll get
2 it all wrong."
3 And listening to each and every one of the
4 presenters, I think we would make anybody who has
5 skeptical doubts about carbon markets turn their head.
6 And this presentation would make (indiscernible
7 01:55:16) and J.D. Dales very, very happy to see that
8 their ideas have been implemented so well. So, from Rio
9 to Kyoto to now, what a journey. And brilliant
10 presentations by everybody.
11 There is a point and an observation and a
12 question. So, I have the privilege of being at the
13 opening of the Chinese carbon market this month to make
14 a presentation (indiscernible 01:55:55) on and you've
15 all have armed me with great evidence.
16 So, my question quickly to each of the
17 participants, what if any arrangements are you making
18 to integrate the Chinese cap-and-trade system into
19 RGGI, California, or Europe?
20 CHAIR WIGGINS: Who wants to jump in and
21 tackle that first?
22 MS. SAHOTA: I'm happy to try and go first.

1 So, in our program, the linkage we have with Quebec is
2 very unique. We started from the same place. We built
3 that program but together they have very similar
4 features.
5 More recently, maybe about four years ago, we
6 added provisions into our regulations that would let us
7 do other kinds of linkages, so linkages where you send
8 your instruments to another market or linkages where
9 you are now able to accept access from another market.
10 And so, we foresee that there are options out
11 there for the different kinds of integration with
12 programs that are not exactly the same as ours. And
13 we've had discussions with the different jurisdictions
14 about what that could look like and what that could
15 mean.
16 The challenge is always going to be that any
17 linkage has the potential to reduce the ambition of
18 your program. And so, there are certain requirements
19 and legislation in California where we have to analyze
20 if any kind of linkage would in any way reduced our
21 ambition. And so that test is really critical, and
22 that's going to depend on the design of the other

1 programs.
2 So, the potential is there. And it's all --
3 it's going to depend on the type of program, the
4 ambition of the other program, and the kind of linkage
5 they're looking for.
6 SECRETARY GRUMBLES: I -- this is Ben in
7 Maryland. And on behalf of RGGI, I just wanted to say
8 that a couple of years ago, we entered into a formal
9 MOU with Chinese energy markets to help inform them on
10 lessons learned from RGGI over the last decade and also
11 to provide technical advice or support. World Wildlife
12 Fund and EDF were involved in that too.
13 So, I would just add that it's a very
14 important point. And we're in the intentional learning
15 and sharing mode with the Chinese as they attempt to
16 make historic progress on this front.
17 MR. BERGMAN: Maybe on our side, also to say
18 on the one hand, with China, we have also been working
19 a lot closely with them for many years to provide -- or
20 at least advisory, knowledge-sharing events. When it
21 comes to -- and we think it's, of course, good that
22 they are going in this direction.

1 When it comes to linking itself, we have our
2 main experiences that we may be linking with
3 Switzerland, which are very tiny as compared to the EU.
4 But it was a good learning exercise in that it's
5 relatively complicated, more than we thought perhaps.
6 And I think like colleagues in California said, what is
7 in principle a good idea and attractive, it's also a
8 little bit risky because on the one hand, once you link
9 two systems, you have to be sure that you don't water
10 down your own system.
11 But what is also perhaps even more difficult,
12 you don't know what will happen, what kind of
13 government will operate in that country a few years
14 later. And if they turn 180 degrees, and you have the
15 link, you have to be very careful. So, I think you
16 need to provide a lot of sort of very good lawyers
17 involved because it is now not just kind of a nice
18 cooperation, but it's really a billion dollars, as I
19 said, every day being traded. So, if something goes
20 wrong, you know, we can have a lot of problems.
21 We were trying to make a very strong
22 cooperation with Australia and they came over to Europe

1 on a weekly basis almost. And then an election, and
2 then the whole thing was thrown in the bin. So, you
3 know, that can happen. That was before we were linked.
4 But, you know, I'm saying that it's good to link, to
5 cooperate, but it's also a little bit of risk.
6 CHAIR WIGGINS: Abigail, do we have any other
7 comments or questions from the Associate Members?
8 MS. KNAUFF: We do not. We do have a
9 question, two questions, from Tyson Slocum for the
10 Members.
11 CHAIR WIGGINS: Okay. We will move to the
12 Members then. Thank you very much for the Associate
13 Members for your questions and comments. So, Tyson,
14 we're opening up the floor to the EEMAC Members on
15 prepared remarks. I think you've indicated you have a
16 question or a comment, so please go ahead.
17 MR. SLOCUM: Great. Thank you so much.
18 First, I just really appreciate the presentations by
19 the panelists. It was excellent. And my question was
20 sort of addressed by elements of Gordon's presentation
21 and by Matthew Picardi's question, that the carbon
22 pricing initiatives that we've seen, particularly in

1 the United States with RGGI and California, are not
2 happening in isolation. They are part of a package of
3 policies and market developments. Other policies like
4 renewable energy mandates, market developments like
5 declining cost of natural gas, replacing coal, and
6 significantly cheaper renewable energy, and flatlining
7 energy demand.
8 I think one of the big benefits of carbon
9 pricing as a part of other policies and initiatives to
10 address emission reductions is the fact that it
11 provides revenue that can be invested for a number of
12 useful emission reduction initiatives. Like in RGGI,
13 there's a lot of money dedicated to energy efficiency.
14 California has a number of very successful robust
15 investment initiatives.
16 But I just think it's important to note that
17 it doesn't appear that the carbon pricing policies, in
18 the United States anyway, are the driving force in the
19 emission reductions that we've seen. We've seen
20 emission reductions from the power sector in all parts
21 of the United States regardless of whether or not there
22 is an active carbon pricing mechanism or not.

1 So, I think it's an important tool, but it is
2 not the only tool to address greenhouse gas emissions.
3 Thank you very much.
4 CHAIR WIGGINS: I don't think we have any
5 other questions from the EEMAC Members; is that
6 correct, Abigail?
7 MS. KNAUFF: Tyson, did you have a second
8 question?
9 MR. SLOCUM: No, I had put it in the chat and
10 people could see it. So, it was just on the role of
11 offsets in carbon pricing plans and whether or not they
12 are effective at, you know, resulting in real emission
13 reductions, or whether or not there are compliance
14 challenges associated with them. And so, I don't know
15 if anyone wants to, you know, comment or respond to
16 that.
17 MR. BERGMAN: If you want, I can say a few
18 words here. So, in the -- from the European
19 perspective that's -- I think around ten years ago,
20 there was a lot of -- the general view was that it's
21 very good to have this credit, and it doesn't matter
22 where emissions are reduced as long as they are reduced

1 and cheap as possible and all of that. So, we allowed
2 quite a lot of this human development mechanism credits
3 in the EU ETS. And it led for us to run in the
4 surplus, but maybe that was our fault that we allowed
5 too many. But also, part of the discussion, were they
6 really genuine emission reductions?
7 And then we have now from '21, we have -- our
8 target is what we call domestic. So, everything has to
9 be reduced in the EU. Then we can help by, you know,
10 development aid money and all kinds of money to support
11 poorer countries in the world, but not to take their
12 credit. It could be that this discussion comes back
13 when there will be even more types of targets coming
14 ahead post-2030.
15 But in that case, it would be very strict, I
16 think, and very limited and very well controlled.
17 Yeah. So, it's at least for us, it's something that we
18 try now to, you know, clean up our own backyard and not
19 do it elsewhere.
20 MS. SAHOTA: And I can speak to the
21 California program because instead of trying to model
22 after the clean development mechanism, or leverage some

1 of the international program, or work that had been
2 done previously, we created our own domestic offset
3 program because there were concerns about the validity
4 of offset programs and credits that had come before our
5 program.
6 And our designs took four years of a robust
7 public process. It was litigated by critics of offsets
8 in California, who think that offsets are just a free
9 pass to emit. But we always have limits on the amount
10 of offsets you could use because we want to make sure
11 that the regulated facilities actually still face a
12 pressure or an incentive to reduce on-site.
13 The other value of offsets is they help with
14 cost containment because they sell for slightly less
15 than the allowance prices. And they allow you to fund
16 activities where you can't necessarily directly
17 regulate. Maybe, you know, we have a lot of land in
18 California that is privately owned. Landowners, like
19 forestry landowners, are very protective of their
20 rights to manage their property the way that they want
21 to manage it. And so, offsets offer an opportunity to
22 act as a carrot to help people come along and do the

1 sustainable management practices that you need and help
2 those actually be part of a climate solution and
3 managed in a productive way that helps on the overall
4 picture.
5 So, we do think that they are important.
6 We've had a program designed specifically for
7 California, it's been litigated, and limits on offsets
8 are also important.
9 MR. BENNETT: Hi, it's Gordon. If I may add
10 a little bit as well. So, I think that offsets are
11 certainly difficult. There's inherent issues around
12 permanence and additionality and measuring quantity.
13 The great thing about cap-and-trade programs is it's
14 really the only way to control the quantity of
15 emissions. But there are -- I think there are real
16 benefits to compliance programs allowing offsets.
17 Because, A, it creates a demand pool, and it links it
18 to a transparent compliance standard. And so, you do
19 get that linkage, you know.
20 So as Rajinder said, that California allow
21 them -- isolates a California carbon offset, and it
22 trades this spread to a California carbon allowance.

1 So, I think that despite all of the challenges that are
2 inherent in the offset market, I think that compliance
3 markets have a real role to play to help set what that
4 high bar of an offset is with environmental integrity.
5 Thank you.
6 SECRETARY GRUMBLES: All right. I know that
7 time is limited, but I just wanted to add on the offset
8 point, I hope the Commission continues to pursue and
9 look at the opportunities for offsets with respect to
10 carbon markets. But the political challenge of the
11 environmental justice, toxic accountability -- so RGGI
12 has not vigorously implemented. It does have the
13 opportunity on a very limited basis the use of offsets.
14 The transportation and climate initiative also in the
15 draft approach on that emerging program also would have
16 a very limited opportunity for offsets.
17 As someone who also represents the Chesapeake
18 Bay, the nation's largest estuary, that is in the U.S.,
19 the possibility for carbon markets for water quality
20 and carbon sequestration throughout the watershed is
21 very important. And the states that are part of RGGI
22 and that are part of the Chesapeake Bay agreement with

1 the EPA are discussing the possibility of offsets and
2 carbon markets for the future, but it is a very --
3 there's a significant challenge -- a real challenge of
4 accountability and political acceptance to use offsets
5 more often. So, I hope the Commission continues to
6 look at that possibility. I think it's the future with
7 appropriate controls. Thank you.
8 CHAIR WIGGINS: Thank you all. And now, we
9 will turn to questions from the Commissioners. And I
10 believe Commissioner Berkovitz has a question to ask.
11 Please go ahead.
12 COMMISSIONER BERKOVITZ: Yes, thank you,
13 Dena. I thank all the panelists for really excellent
14 presentations. I just have a really basic question to
15 understand, for example, the California and the RGGI
16 program. So, for example, in RGGI, a regional program
17 that the states issue the allowances. So, there's a --
18 Secretary Grumbles, if there's a 30 percent reduction -
19 - or if RGGI as a whole decides on a certain percentage
20 of reduction, but the state issue the allowances, does
21 that 30 percent go -- flow down to everybody or -- and
22 each state has 30 percent, and then the state -- do 30

1 percent across the board to everybody? And is that how
2 it works? And similarly, for California, when
3 California issues a certain target, does it flow down
4 equally to everybody, and then the participants amongst
5 themselves?
6 That's the whole point of cap-and-trade,
7 essentially, that everybody can decide best how to get
8 to that 30 percent. Secretary Grumbles, maybe you want
9 to take the first --
10 SECRETARY GRUMBLES: It does flow down, but
11 it's also -- the 30 percent component of our regional
12 cap has to be implemented by -- under state law in each
13 of the states. So, it -- you know, there is some
14 flexibility on how each of the states gets there, but
15 that goal -- the goal is to get to 30 percent.
16 And of course, when we couple our renewable
17 portfolio standard and other complementary programs, we
18 are trying to get to 56 percent, half as dirty by 2030,
19 50 percent -- 56 percent reduction in greenhouse gas
20 emissions in our state. So is that -- it does -- it's
21 a regional cap, and each of the states commits to try
22 to put in place to do their part to ensure that region-

1 wide we get to at least a 30 percent reduction.
2 COMMISSIONER BERKOVITZ: And that commitment
3 has -- RGGI was started -- when was RGGI started?
4 SECRETARY GRUMBLES: Back in -- 13 years ago
5 is when we had our first auction, 2009. But there were
6 formal agreements among governors dating back a few
7 years prior to that.
8 COMMISSIONER BERKOVITZ: And that regional
9 agreement, that's withstood. You've described the new
10 states that want to come in. But in terms of the
11 existing states, that's pretty much survived the
12 various, you know -- there have been various political
13 changes and governorships and legislatures.
14 SECRETARY GRUMBLES: They've survived
15 political changes. There have been a few legal
16 challenges that have not succeeded -- trying to say it
17 was an interstate compact. So, flexibility is very
18 important for each of the states, and political
19 leadership and use of the market to set the prices and
20 not give the allowances to the regulated entities but
21 direct them to use the market as an auction, and the
22 secondary market, to make sure they have they have the

1 acquired -- the requisite number of allowances each
2 time the control period, the compliance period occurs.
3 COMMISSIONER BERKOVITZ: Okay. Thank you.
4 Thank you. And then California, when you set these
5 overall goals, is it then that's the point of cap-and-
6 trade that the entities figure out how to best -- some
7 industries have more need or less need? They can trade
8 amongst them --
9 MS. SAHOTA: That's correct. Yeah, that's
10 correct, Commissioner. We did -- so it's an aggregate
11 cap set at the state level for GHG. There's no cap for
12 individual facilities under the program because these
13 are not like traditional air pollutants that have a
14 localized impact. They're global emissions. And so,
15 as the state is achieving that jurisdictional-wide
16 target, we are -- we believe that is the right
17 approach.
18 We did look at an option in 2017 in response
19 to some of our environmental justice advocates who
20 wanted us to take that aggregate cap at the state level
21 and apply it at every individual facility. So, every
22 individual facility would have to reduce by 40 percent

1 by 2030.
2 What we quickly realized is that some
3 industry that was high leakage exposed and that was --
4 there was very limited technology known of right now to
5 get them to that 40 percent, we just had to turn those
6 off in the modeling because there was no option for
7 them to get to that 40 percent.
8 And so, the cost of doing that individual cap
9 per facility versus the aggregate cap was almost an
10 order of magnitude higher to the economy by 2030 and to
11 jobs and household income just because of the fact that
12 you've applied that aggregate level at the individual
13 facility level. And so, we did the exercise because
14 our environmental justice community wanted to look at
15 it. And it became quickly apparent that it was
16 something that would just wreak a lot of havoc on the
17 economy for the state.
18 COMMISSIONER BERKOVITZ: Okay. Thank you.
19 CHAIR WIGGINS: I don't think we have any
20 more questions from Commissioners; is that correct?
21 Any Commissioners have any questions?
22 MS. KNAUFF: We don't have any questions at

1 this time. Thank you, Dena.
2 CHAIR WIGGINS: No further questions, right,
3 Abigail? I'm sorry, I couldn't hear you.
4 MS. KNAUFF: Yes, no additional questions at
5 this time.
6 CHAIR WIGGINS: Okay. All right. Well,
7 thank you all for the participation and the
8 presentations on the first panel. We will go ahead and
9 move to the second panel today, which will provide a
10 survey of carbon derivative products listed on three
11 designated contract markets. We're going to hear again
12 Gordon joining us for the second panel as well as the
13 first panel. We'll hear from Gordon Bennett, the
14 Managing Director of Utility Markets at the
15 Intercontinental Exchange, Christian Schneider, the
16 Managing Director of Strategy at Nodal Exchange, and
17 Derek Sammann, the Senior Managing Director, Global
18 Head of Commodities, and Options Products at CME Group.
19 Gordon, we'll take it back to you.
20 MR. BENNETT: Hi there. Thank you. Hello
21 again, everybody. So, my objective for this panel is
22 to give an overview of the ICE environmental portfolio

1 and an update on performance and any new initiatives
2 since my colleagues, Mike Kierstead and Steven Hamilton
3 presented to you previously.
4 First of all, as discussed in the first
5 panel, ICE offers solutions whether quoted markets or
6 complemented by data services, access to being able to
7 fair value products and to drive sustainable finance
8 decision-making.
9 If you could turn to the next slide, please.
10 And the next slide, please. Importantly, ICE entered
11 the environmental markets at a very early stage, with
12 development going back to 2003 with its collaboration
13 with the climate exchange and Dr. Sandor, who is here
14 and it's great to hear from him, and then the
15 subsequent purchase in 2010.
16 So, we have a long history in operating
17 environmental markets. The New York Stock Exchange has
18 sustainable ETS with over $5 billion in value. And
19 Steven Hamilton would have introduced you to our ESG
20 equity futures portfolio at the last meeting. Our ESG
21 data offering is expanding rapidly to help customers
22 attribute value as we grapple with the transition to a

1 sustainable finance business model.
2 Next slide. However, for the purpose of this
3 meeting, I will focus on our environmental portfolio.
4 And next slide, please. And one more. So,
5 this slide gives an overview of our environmental
6 portfolio, which we split into carbon and green
7 products. Our carbon products are further split
8 between allowances and offsets. Allowances are issued
9 by regulators in cap-and-trade programs and are highly
10 standardized. And importantly, as I said earlier, the
11 only mechanism available to control the quantity of
12 emissions. And so, from a net-zero perspective, the
13 cap, the quantity of emissions, can therefore be
14 aligned with a net-zero road map and commitment.
15 Offsets are created when a project reduces
16 emissions and where emission reductions are only
17 economical if there is additional revenue from the
18 selling of the offset, otherwise known as
19 additionality.
20 Most offsets today avoid the emissions rather
21 than reduce emissions with the exception of carbon
22 removals, whether nature-based or technology-based. In

1 contrast to a carbon allowance, it does not control the
2 overall quantity of emissions. Our allowance markets
3 of EUA, UKA, CCA, and RGGI were all covered in the
4 first panel session. And until recently, we've offered
5 two offset contracts: the CER, the certified emission
6 reductions, and the CCO. These are effectively
7 compliance offsets because both the EU and California
8 allow the percentage of covered entities compliance
9 obligation to utilize offset.
10 And as I said in my answer to your previous
11 question, this created a demand group for offset and
12 also let to the prices in offset being anchored to a
13 transparent liquid allowance market. Under phase four
14 of the EU ETS, offsets no longer are allowed to be
15 used. And therefore, we've recently delisted our CER
16 contract. And so, for the moment, the CCO is our only
17 offset contract in the environmental portfolio.
18 Our green products include both renewable
19 fuels, such as biodiesel and ethanol, and renewable
20 attributes, such as renewable electricity certificates.
21 These attributes are sometimes referred to as
22 guarantees of origin, and the electricity sector, for

1 instance, allows participants green electricity
2 consumption. Renewable electricity portfolio is
3 perhaps less well known than our carbon portfolio. It
4 covers a number of power markets in the U.S., and it
5 surprises many people when they find out that the most
6 liquid renewable electricity market in the world are in
7 North America. Like the carbon cap-and-trade programs
8 in the U.S., these are also state-driven initiatives.
9 Next slide, please. So, to get an idea of
10 the size of ICE's carbon markets, on this slide, we
11 show the tons that are traded in ICE's carbon markets
12 in aggregate but also under each cap-and-trade program.
13 And almost 14 gigatons, or 14 billion tons, of carbon
14 trade on ICE each year. That's equivalent to 40
15 percent of the world's energy-related carbon footprint.
16 In 2021, approximately 60 million tons and $3
17 billion of notional value is traded each day in our
18 market, and approximately 95 percent of all traded
19 environmental futures and options are traded on ICE.
20 The open interest of our carbon portfolios in Europe
21 and USA is approximately $100 billion and $10 billion,
22 respectively.

1 Next slide. Some other 2020 highlights
2 include strong year-on-year growth of 14 percent in our
3 environmental portfolio open interest. The UKA -- the
4 EUA market, rather, particularly has seen very strong
5 growth in ADV, and EUA options have had an open
6 interest record with over 800,000 lots or 800 million
7 tons. In the USA, RGGI has seen the strongest growth
8 with ADV of 75 percent. The U.S. RECs open interest is
9 up 15 percent as well. And in fact, leading up to
10 2021, the U.S. portfolio is actually our fastest-
11 growing portfolio within the environmental complex.
12 Next slide, please. I will touch briefly on
13 the offset market. Clearly, there's an increasing
14 focus on the rules of the offset markets with many
15 working groups being set up including the Taskforce on
16 Scaling Voluntary Carbon Markets, which we sit on, and
17 I think you'll hear from Annette later. As you will
18 see in the next slide, the offset market is not new.
19 It's been around for many years and ideally will play a
20 role, a complimentary role to allowance markets in
21 achieving net-zero targets.
22 Unfortunately, if we had to meet net-zero

1 targets, we probably need a value to -- a way to value
2 natural capital in such a way that there are economic
3 incentives to preserve rather than extract natural
4 capital and offset that could play a key role in
5 creating value in preservation.
6 Next slide, please. This slide shows the
7 relative size of the offset market. On the left-hand
8 side, the voluntary market is benchmarked along with
9 the compliance market of EUA and CCA. And like I did
10 in the first panel, I've stripped out EUA's because
11 it's so much bigger than all of the other markets;
12 it's difficult to distinguish other markets. But the
13 offset market today is small in comparison to the
14 compliance market. However, it appears between 2008
15 and 2012, there's actually a fairly robust tradable
16 offset market in the ICE certified emission reductions.
17 Over this period, approximately 3 billion
18 tons of CERs traded. These CERs were allowed to be
19 utilized for compliance purposes under the EU ETS and
20 therefore traded as a spread for the EUA and
21 effectively created an international price of carbon
22 denominated in euros.

1 In the table at the bottom, it shows that
2 there are many different types of offsets and quite a
3 wide range of values between those offsets. I'd also
4 add that the largest component of offsets today are
5 renewables. And there's quite a large swathe of
6 opinion now that -- the discussion around whether
7 renewables continue to meet the additionality test. So
8 perhaps, when we're thinking about offset, the mix of
9 offsets that we have today may look very different in
10 the future and to help sort of meeting our net-zero
11 targets.
12 Last slide. So, my last slide covers our
13 most recent offering in the carbon space, which is our
14 global carbon futures index. We launched this
15 approximately a year ago. This is our volume weighted
16 aggregate index of ICE carbon allowances. There are
17 contracts between the EUA, CCA, and RGGI. We will
18 hopefully be adding UKA in the course of the next year
19 or so.
20 The purpose of this index is to bring
21 transparency to the carbon pricing of the most liquid
22 carbon allowance markets in the world really trying to

1 create a proxy for a global price of carbon. And as
2 carbon evolved into its own separate asset class, the
3 index can serve many purposes. But initially, we think
4 it's a useful benchmark for corporates, regardless of
5 whether they are subject to carbon cap-and-trade
6 mandates or not, to be able to benchmark their own
7 shadow or internal price and carbon assumptions in
8 their business models.
9 So finally, this is the era of carbonomics.
10 And as I always start my presentation at ICE Futures
11 Europe board meetings, carbon will become the most
12 important asset class in the world. Thank you very
13 much.
14 CHAIR WIGGINS: Thank you, Gordon.
15 Christian?
16 MR. SCHNEIDER: Yeah. Good morning. My name
17 is Christian Schneider. I'm representing Nodal
18 Exchange and EEX Group today. First of all, I'd like
19 to thank Mr. Berkovitz, Chairman Behnam, and the
20 Commissioners for giving me the opportunity to speak
21 and to share my perspective on carbon markets. Also,
22 special thanks goes to Abigail for the excellent

1 preparation of this meeting.
2 If you could go to the next slide, please.
3 Let me start here with a very quick intro of EEX Group.
4 We are a specialized commodity exchange group. We
5 operate energy, environmental, agricultural, and
6 freight markets. And apart from commodity derivatives,
7 we also run physical spot markets. We are active in
8 environmental market since about 16 years now. And the
9 companies belonging to the group, which you can find in
10 the lower part of this slide, they are all specialized
11 in different markets and provide local support for the
12 local customers.
13 So, for example, Nodal Exchange covers all
14 the U.S. markets, and they belong to the group since
15 about four years now. We are present in 17 locations
16 worldwide and are part of the Deutsche Börse Group.
17 Next slide, please. So, when talking about
18 carbon markets, probably it's important to first take a
19 step back and look at the bigger picture because carbon
20 emissions are a real global challenge, and it can only
21 be addressed collectively by all countries.
22 So where do carbon markets exist as of now --

1 and where not -- and the map you see here is borrowed
2 from the ICAP, International Carbon Action Partnership,
3 which shows the state of emission trading schemes in
4 the globe, the most recent one. And you can see in
5 blue those ETS which are already active, in dark green
6 those that are under development, and in light green
7 these are at least under consideration. And I hope it
8 gives you a little impression about global coverage and
9 the state and the roadmap of carbon markets worldwide.
10 So far, we covered 16 percent of greenhouse
11 gas emissions with emission trading scheme. The
12 Europeans have been first with the EU ETS in 2005, and
13 the U.S. is present with the two-regional scheme for
14 California, Quebec, and RGGI. These are the two
15 largest carbon markets today. But also, let's keep an
16 eye on China which announced to go fully operational
17 with their carbon trading on national level this year,
18 which will become the largest market, by cap at least.
19 Without mentioning all the carbon markets, I
20 think in the end, no matter how big or small an
21 initiative is, everything counts towards our common
22 goal, which is limiting the global warming by

1 eliminating carbon emissions.
2 Please go to the next slide. And eliminating
3 carbon emissions is a big target in itself because we
4 have to reduce more than 50 billion tons of manmade CO2
5 equivalent greenhouse gases which we emit every year to
6 zero, or achieve net-zero carbon neutrality to be more
7 precise. And carbon pricing through carbon cap-and-
8 trade schemes is an important mechanism to support
9 that. Not the only one, that's true, but a very
10 important one -- because through the market, we can
11 determine the most cost-efficient way for a transition
12 to a low carbon economy.
13 And we as energy and environmental exchanges
14 and I'm speaking for all of us here on this panel, we
15 can contribute to that. We build communities. We
16 build markets. We determine fair prices, we provide
17 nondiscriminatory access, provide price transparency,
18 provide risk management tools. In other words, we
19 apply all these proven mechanisms from financial
20 markets to create trust amongst market participants for
21 transacting efficiently in a safe and reliable,
22 regulated environment for carbon as well.

1 Next slide, please. So, this is an overview
2 of all the environmental products listed and all the
3 services offered by EEX Group in this area. As you can
4 see, it includes more than 20 different carbon
5 contracts across North America, Europe, and here also
6 New Zealand. We listed all the major contracts there,
7 California Carbon, RGGI, EUA, and so on. We are active
8 in primary markets as well as secondary markets, spot
9 and derivatives. I will show you an example for that
10 in a minute.
11 But we also didn't stop here. We also went
12 into other emission allowances like sulfur dioxide or
13 NOx emissions under the EPA Cross-State Air Pollution
14 Rule, for example. Actually, this part has actually
15 been expanded this week by a new contract. We list the
16 various renewable energy certificates, guarantees of
17 origin, renewable fuel credits, like LCFS and RINs.
18 And we did so in order to accommodate other
19 environmental programs which are supplemental to carbon
20 markets and further help to decarbonize our world.
21 In the end, it's a big puzzle of different
22 components which contribute to the same target. As you

1 can see, we have a very, very granular set of
2 contracts. And we're very proud to offer such a very
3 granular set of contracts because it helps our clients
4 to achieve their sustainability targets and ultimately
5 also our sustainability targets. And all these
6 contracts have been launched based on customer demand.
7 So, the large majority of them has traded, some
8 sporadically or someone on a regular basis. This is
9 always a process.
10 And clients come from different industries.
11 They are utilities, banks, industry players, carbon
12 funds, intermediaries, different kinds of clients being
13 active. And of course, we will not stop here. We will
14 continuously enhance our portfolio and develop the
15 carbon markets and the wider environmental markets in
16 the U.S. and also worldwide.
17 Next slide, please. So here, we are digging
18 a little bit more into carbon. I just wanted to show
19 you the main parameters of the contracts like of a
20 typical carbon futures contract. Usually, this
21 comprises 1,000 allowances, each representing one ton
22 of CO2 equivalent greenhouse gases depending on the

1 program it covers. It's listed in dollars or euros.
2 It's usually monthly contracts. It mainly has a main
3 expiry in December, and they are physically settled via
4 registries.
5 We at EEX Group engaged in 2005 for the first
6 time in this market. We started in Europe with EEX,
7 expanded to the U.S. market with Nodal in 2018. Since
8 2017, we are successfully cooperating with IncubEx
9 which is a business development and marketing
10 organization founded by the ex-climate exchange guys.
11 And worth mentioning is also that we operate
12 large-scale primary market auctions for the E.U.
13 Commission and the governments of all the European
14 member states almost on a daily basis. And in these
15 primary market auctions, we have sold more than four
16 billion EUAs so far on behalf of the member states in
17 the common auction platform and the states which opted
18 out of the common auction platform. More than 2,000
19 auctions so far which resulted in more than €60 billion
20 of proceeds which went into climate and energy-related
21 purposes.
22 We also listed the global offset contracts

1 under the Kyoto Protocol like CER and ERU contracts.
2 They're project-based however not eligible anymore in
3 trading Phase 4 in Europe, so you cannot count them
4 anymore to reduce emission reduction target.
5 EEX will also enter the UK emissions market
6 in the next few weeks. We will organize the sale of
7 allowances in the new German Fuel ETS which is a
8 separate emission trading scheme that covers additional
9 sectors that are currently not covered by the EU ETS,
10 transportation and heating. And we cooperate with NZX
11 in the New Zealand primary market auction.
12 One important aspect as to why we are engaged
13 on so many levels is that we always aim to create an
14 ecosystem of services for our clients to combine the
15 primary market auctions where allowance are first
16 distributed to the market to daily asset optimizations
17 with markets to hedging to trading, futures, and
18 options all cleared and settled by a clearinghouse.
19 On the next slide, we'll have a look at the
20 development of carbon market activity. So next slide,
21 please. And so, what you see here is an overview of
22 the market development in the past five years. It

1 shows the total market volumes, January 2016 to March
2 2021 by calendar month. North America in the upper
3 part of the slide and Europe in the lower part.
4 Futures in blue, options in green. As I said, these
5 are industry volumes, not just EEX Group. We are not
6 the market leader in this space, but still our EUA
7 carbon futures in Europe traded at an ADV of 2.2
8 million tons or 2200 lots in 2020. And our OI stands
9 at about 250,000 lots by the end of May. This
10 represents about $15 billion.
11 I just wanted to show you the development of
12 the whole industry in order to illustrate the
13 overarching trends on the full scale. So clearly, we
14 see interest in carbon markets has accelerated over the
15 past five years. We saw roughly 2 million contracts
16 traded in the U.S. That's about a third up from the
17 previous year. And open interest doubled in the past
18 two years. There's now about 1.1 million contracts.
19 In Europe, which is much larger by cap, we
20 also saw increased trading volumes to about 11.7
21 million contracts and an open interest of 1.7 million
22 lots. Maybe noteworthy here is the price development

1 of one ton of carbon dioxide in Europe. We saw that
2 previously in the presentation by Hans Bergman, which
3 was more than six-fold over the past five years to more
4 than $60 per ton today. If you look into the graph,
5 there's a spike in volumes in March 2020. This is
6 related to the price drop of the first COVID lockdown.
7 Please move on to the next slide. This will
8 also be my last slide in the presentation. So, while I
9 already gave you an impression about the development of
10 carbon markets in the recent past, let's also look into
11 some trends for the future. I believe carbon markets
12 are still in the development stage and they will become
13 a major economic factor even more than today.
14 Just in the recent months, we have observed
15 states reinforcing and even improving their commitment,
16 we saw the UK launching their own ETS connected also
17 with a higher ambition to tighten carbon emissions.
18 But they will sign into law at 78 percent reduction
19 until 2035. And also, Germany plans to achieve more
20 ambitious carbon targets, so they want to go to net-
21 zero by 2045, so five years earlier than initially
22 planned and committed in the Paris Agreement.

1 We'll also see new ETS. Regional coverage
2 will increase over time. We hear that Virginia is now
3 part of RGGI and others are in the process to join the
4 RGGI scheme as we heard from Ben Grumbles this morning
5 which is very encouraging in my point of view. We also
6 see new countries setting up ETS. You remember the map
7 I showed you in the second slide. And, well, then the
8 potential linkage of carbon trading schemes is
9 discussed and is certainly an option in the future.
10 We'll see new sectors to be included:
11 maritime sector, aviation sector, transportation. All
12 this is relevant to increase the coverage of greenhouse
13 gas emission schemes. A very important work can also
14 be attributed to the voluntary carbon market segment,
15 which is complimentary to the compliance market. It is
16 not based on governmental policies but on a consensus
17 among corporate entities to reduce carbon emissions in
18 order to combat climate change.
19 So, all of these trends, and certainly there
20 are many more, I would expect to shape the
21 environmental markets of tomorrow, globally, as well as
22 domestically. And I think ultimately, it's every

1 effort that counts. So, we at EEX Group are committed
2 to support the development with even more products and
3 services.
4 And with that, I'd like to conclude my
5 presentation. And thank you very much for your time.
6 CHAIR WIGGINS: Thank you, Christian. Derek?
7 MR. SAMMANN: Right, thank you. I'd like to
8 thank Commissioner Berkovitz for convening this EEMAC
9 committee. And certainly, the breadth of participation
10 across market participants in the industry in this
11 important conversation is critical at a point in time
12 when this has become more than just a political
13 conversation. This is an economic reality for all of
14 us. So really appreciate the opportunity to be part of
15 this conversation. Acting Chairman Behnam,
16 Commissioner Berkovitz, Commissioner Quintenz, and
17 Commissioner Stump, thank you for having us and giving
18 us the opportunity to talk about what CME Group is
19 doing in this space.
20 My name is Derek Sammann. I'm Senior
21 Managing Director of CME Group. I oversee our global
22 commodity portfolio, which is a combination of our

1 energy business, our agricultural products business,
2 and our metals business. And I also oversee our cross-
3 asset class options business. We're very pleased to be
4 here this morning to talk through and update the
5 committee and market participants here on CME Group's
6 voluntary emissions offset initiative. We've heard a
7 lot about the difference within cap-and-trade. We've
8 just heard some conversation about the volunteer
9 program. I want to share a little bit about what we're
10 doing in this space and some markets we've just
11 launched earlier this year.
12 Starting to -- so put this -- if you can just
13 go back to the previous slide for me, please. I think
14 you're on the very last -- there, yeah. Thank you. To
15 put this in the broader context, environmental, social,
16 and governance issues are increasingly important to our
17 clients with CME Group as they are our investors and
18 our employees. As a global corporate citizen, CME
19 Group has responsibilities to all of these stakeholders
20 especially in challenging the unpredictable times that
21 we've just experienced in this past year. We aspire to
22 transform the industry while always adhering to our

1 values.
2 Ultimately, it's about earning and
3 strengthening our stakeholders' trust and positively
4 making a difference. We're focused on partnering with
5 our customers to develop and introduce risk management
6 products that address the growing and changing
7 environmental interests and needs of clients across
8 financial and commodity markets and to help advance a
9 more sustainable economy. We are constantly in
10 conversation with our clients regarding products and
11 services to meet their evolving risk management needs.
12 And as a global business operating in a
13 complex environment, we understand the importance of
14 developing both innovative and sustainable business
15 solutions. Specific in the energy space, our company
16 is designed to help global customers manage price risk
17 in today's energy and agricultural ecosystems as these
18 industries develop new technologies and other
19 initiatives to meet market movement towards alternative
20 sources of cleaner energy and sustainable agriculture.
21 Next slide, please. Turning now to
22 emissions, exchange cleared emission contracts are

1 primarily focused on the mandatory or regulated
2 markets. We've heard a lot about that so far today in
3 the earlier presentations. These markets make a lot of
4 sense for the cleared space since they've clearly --
5 they have clearly defined rules on how transactions are
6 structured, who's subject to emissions cap, and
7 specifics about what allowances can be used when.
8 However, the disparity in the various
9 frameworks results in a lack of transferability or
10 fungibility between different schemes. There's no way
11 I can swap my California carbon allowance, for example,
12 against the European Union allowance. This inhibited
13 exchanges and market structure from structuring a more
14 global carbon market contracts off of these underlying
15 fragmented markets.
16 Historically, balance offset market is the
17 opposite problem. Emissions reduction projects which
18 generate offset credits can be located in any country
19 in the world. While reputable offset registries have
20 been verified issuing credits for decades, there was no
21 overall framework to tie in the various regions,
22 registries, and projects together to create a

1 standardized price and set of common attributes which
2 are necessary towards an exchange cleared futures
3 contract. Offsets are sourced today in the OTC market
4 on a project-by-project basis. The decentralized and
5 opaque nature of these markets has caused frustration
6 and confusion for both buyers and sellers.
7 Next slide, please. Meanwhile, demand
8 permissions offset credits has soared. The number of
9 entities who have pledged to meet carbon-neutral goals
10 by 2050 through the UN Race-To-Zero campaign doubled in
11 2020. There are now more than 120 countries, 2,000
12 businesses, and 700 cities that have made this pledge,
13 which account for over 50 percent of global GDP. As
14 institutions and governments make these net-zero
15 commitments, they need time to determine how to shift
16 to low or zero carbon business practices. Known
17 solutions may not be economically viable or scalable
18 from a technology perspective in the near term.
19 Offsets play a key role in making meaningful
20 action while longer term solutions are developed. CME
21 Group participates in the Taskforce on Scaling
22 Voluntary Carbon Markets, which has outlined that the

1 offset market could increase 15-fold by 2030, faced
2 with overall carbon credits worth up to $50 billion by
3 2030. In order to scale in an efficient and
4 transparent manner, the Taskforce is called for
5 standardized exchange-traded instruments.
6 Next slide, please. The International Civil
7 Aviation Organization, ICAO, the UN specialized agency
8 adopted the carbon offset and reduction scheme for
9 international aviation known as CORSIA as a marketplace
10 mechanism to meet the ambitious goals of carbon-neutral
11 growth from an international aviation beyond 2020.
12 This is important as emissions from international
13 aviation is higher than all but five countries in the
14 world. The ICAO relies on guidance from an internal
15 group of experts called the Technical Advisory Board,
16 which is composed of experts in 19 different countries.
17 While the framework was adopted in 2016, the
18 ICAO only started to approve registries in March 2020.
19 The agency has approved eight voluntary carbon offset
20 registries and subsets of protocols within these
21 registries, which airlines can use to comply with
22 CORSIA. CORSIA's rigorous screening process,

1 international recognition, and adoption by the private
2 sector even beyond just airlines makes it one of the
3 best frameworks for voluntary emissions markets today.
4 Next slide, please. Based on the widespread
5 demand for offsets and the approval of registries and
6 protocols under CORSIA, CME Group has worked with
7 Xpansiv Market’s CBL to launch the global emissions
8 offset futures contract, what we call, a GEO contract.
9 The contract allows buyers and sellers to make or take
10 delivery of offset credits that meet the CORSIA
11 standards from three of the approved registries.
12 Since launching in March of this year, there
13 have been more than 200,000 offsets traded through this
14 mechanism by a broad array of customers in both Europe
15 and the United States. The contract has already
16 enabled better price transparency out across the curve
17 for voluntary emissions credits. Equally as important,
18 it has jumpstarted conversations around the world about
19 how to develope better environmental hedging
20 instruments.
21 While the voluntary emission market is
22 relatively new in the current commodity space, there's

1 nothing especially unique about the GEO futures
2 contract. The GEO contract gives the same regulatory
3 oversight, options for trade execution, counterparty
4 risk protections, and delivery mechanisms as any other
5 physically delivered exchange cleared contract.
6 There's also no obligation to make or take delivery
7 offset through the GEO futures contract. Like any
8 other commodity markets, many firms either roll their
9 position, exit close out that position, or undertake an
10 EFP or exchange for physical prior to expiry.
11 There are a variety of reasons why firms plan
12 to use the GEO futures contract to make or take
13 delivery. As mentioned earlier, there's a substantial
14 demand for entities to meet emissions reduction goals.
15 A standardized contract that delivers defensible offset
16 credits and is in high demand especially for firms
17 navigating the space for the first time. Some firms
18 may even take a hybrid approach of acquiring and
19 retiring a mix of standardized offsets like GEO and
20 project-specific offsets. Many firms have come to CME
21 Group for other reasons to take delivery, off an
22 exchange current emissions contract, structure carbon-

1 neutral transactions.
2 Next slide, please. Just as CORSIA has a
3 phased approach where airlines use offsets in the near
4 term as they transition to low carbon aviation fuels
5 and more efficient technologies, producers and
6 marketers are also looking at carbon-neutral
7 commodities as a bridge to more sustainable,
8 differentiating commodities. Whether it's in oil,
9 corn, natural gas, aluminum, or steel, firms can act
10 today by pairing offset contracts with traditional
11 commodities.
12 This involves calculating the emissions
13 associated with the production and transport of the
14 traditional commodity, purchasing the corresponding
15 offset credit, and then selling it as a structured
16 carbon-neutral deal. There are many examples of these
17 transactions in the cargo space whether it's carbon-
18 neutral LNG, carbon-neutral crude, condensate, or
19 nafta. GEO futures make it easier to acquire the
20 offset component in the short-term and facilitate more
21 effective long-dated hedging for bundled transactions.
22 Next slide, please. Similar to other

1 commodities markets, we expect differential for basis
2 markets to emerge over time which are anchored to a few
3 benchmark offsets contracts. Offset basis markets can
4 be focused on specific regions, product size, or
5 community benefits. This will also allow firms to
6 concentrate liquidity in the prevailing benchmarks or
7 secure a more precise hedge either in the spot market
8 or by using exchange for differential contracts. This
9 is common practice now in our crude oil markets today,
10 for example, where WTI futures trade over a million
11 contracts a day and grades such as Western Canadian
12 Select, Mars, West Texas Sour, and a Louisiana Light
13 Sweet all traded differential to the WTI benchmark.
14 From an exchange perspective, there's no
15 silver bullet for the voluntary emissions market.
16 GEO futures utilize the best available international
17 framework with CORSIA, but it's only the first step in
18 providing more efficient and transparent markets in the
19 space. We will continue to work with the leading
20 industry associations, governments, customers, and
21 environmental organizations to determine which pricing
22 instruments are most useful for the market to adopt for

1 the long term. The pace at which industry and
2 government is moving to address climate concerns is
3 unprecedented. This market looks far different in a
4 few years' time than it does today.
5 As a global marketplace, CME Group will
6 facilitate conversations, aggregate and synthesize
7 feedback, and advice on lessons learned to the
8 development of thousands of commodities contracts over
9 the past 160 years. Once industry consensus services
10 and liquidity strengthens, CME Group will provide a
11 venue where firms can execute voluntary emissions
12 contracts in a transparent and efficient way.
13 Ultimately, this will provide more certainty and better
14 risk management practices as customers move forward in
15 this global energy transition.
16 With that, again, I'd like to thank
17 Commissioner Berkovitz for convening this important
18 conversation, bringing this group together. And with
19 that, I will turn the meeting back to the Commission.
20 CHAIR WIGGINS: Thank you very much, Derek.
21 At this time, I'd like to open the floor to questions
22 and comments from the Associate Members on the

1 presentation. Do we have anyone, Abigail, who has
2 indicated they wish to comment?
3 MS. KNAUFF: No one has indicated that they
4 wish to comment, but if there's anyone on the line that
5 would like to ask a question, please go ahead.
6 DR. PARSONS: This is John Parsons. I
7 thought I'd put into the chat a request to ask
8 questions.
9 MS. KNAUFF: Go ahead, please. Go ahead.
10 DR. PARSONS: Sure. So, I think my question
11 is most likely for Mr. Sammann about the offset.
12 Certainly, there have been a lot of challenges as we
13 discussed in the first panel to the quality of offsets,
14 whether or not you're truly getting the carbon neutral
15 when you -- like when you talk about carbon-neutral
16 LNG, it's not clear that these offsets are really
17 producing actual reductions in emissions.
18 But my question has to do more with the
19 exchange and the quality of the futures. We have
20 experienced and I guess the label I would put on this
21 is self-dealing. There's an organization deciding what
22 counts as an offset, allowing various registries,

1 allowing various emissions -- types of projects to be
2 included. We have experienced with this before with
3 the credit default swap market where there's a private
4 organization deciding about credit events and perhaps
5 making decisions about credit events that serve their
6 interests and are not the right decisions, so to speak,
7 not a fair or unbiased choice about credit events.
8 And I'm wondering, how do you assure the
9 quality of an offset market when the people who are
10 establishing this market are the companies who need the
11 offset and in the event of various things happening may
12 choose to change what qualifies as an offset? How do
13 we avoid self-dealing?
14 MR. SAMMANN: Yeah, it's a great question.
15 And I think there's a pretty significant difference
16 between the example you gave in terms of credit default
17 swaps versus how this framework has come together.
18 I think one of the most important things to
19 note is that the overall framework is overlaid and
20 actually fits inside the UN regulation. And the whole
21 UN framework has set the infrastructure for how these
22 registries get set, how they get oversighted. And so,

1 the registries themselves -- and we actually for our
2 contracts, we've got three individual registries of the
3 eight accepted by CORSIA. These are within and
4 approved and mandated and regulated by the United
5 Nations themselves. That is -- we've accepted three of
6 those registries right now.
7 And as that market evolves, we'll be looking
8 at potentially adding additional registries over time.
9 The three registries that we accept right now are the
10 Verified Carbon Standards or VCS registry, the Climate
11 Action Reserve, CAR, and we've got a third one,
12 American Carbon Registry.
13 So, I think the difference is, and I think
14 you make an excellent point, you've got to be careful
15 who's doing the oversighting and who is actually
16 participating in the market. So, in this particular
17 case, the framework is a UN framework. It fits inside
18 that oversight mechanism. Those registries are
19 mandated there. We then look at those from our
20 prudential regulatory point of view and determine which
21 of those registers we feel comfortable that are most
22 consistent with the kinds of needs that the products

1 that we're developing suit our customer needs.
2 So, we're not in a situation where the self-
3 dealing argument that I think you raised, very rightly
4 so, is not a concern in this particular case. So,
5 we've separated by definition those who are managing an
6 oversight of the registries themselves versus those
7 that are doing the trading.
8 So hopefully, that provides some detail.
9 I've got lots of detail we can provide on the
10 individual registries themselves if you want to follow
11 up on that, but I'm certainly happy to take any further
12 questions on that.
13 CHAIR WIGGINS: Are there any further
14 questions from Associate Members of the EEMAC? Hearing
15 none, let's move to the Members of the EEMAC. Anyone
16 who is a Member of the EEMAC have a question for the
17 panel? Abigail, do you have any indication that we
18 have any questions from the EEMAC Members?
19 MS. KNAUFF: We don't have any Members, but
20 if we could just go back. I see just now one from
21 Sarah Tomalty, who's an Associate Member.
22 CHAIR WIGGINS: Okay. Sarah, please go

1 ahead.
2 MS. TOMALTY: Sure. Thank you very much for
3 these presentations. It's -- these remarks are
4 extremely important for us to be able to manage our
5 risk, so really appreciate the fact that they're
6 growing, and interest is growing in them. But given
7 the global nature of the primary markets that underlie
8 the futures products, how do we ensure that the quality
9 of the credits that make up those markets? How do we
10 ensure the quality of the credits that make up those
11 markets and that those credits are not later
12 invalidated?
13 MR. SAMMANN: So maybe I'll pick up the first
14 piece. It's very similar to the comments provided by
15 Dr. Parsons. When we look at the International Civil
16 Aviation Organization, ICAO, which is that UN
17 specialized agency, they've adopted the carbon offset.
18 They've adopted the CORSIA framework overall. There's
19 a market-based mechanism to meet that ambitious goal of
20 carbon-neutral growth. So, when you look at the ICAO,
21 that's got the approval of those underlying markets and
22 actually oversight those markets.

1 So, I think I'm probably going to replicate
2 what I just said a moment or two ago, the -- all of the
3 products, all the offsets have to be applied into the
4 registry, those registries themselves work and validate
5 those, and those then go out to be potentially traded
6 on different markets. We look at those under the UN
7 framework to determine which of those registries we
8 accept those into. And we've accepted these first
9 three because we feel those are the most robust of the
10 eight that have already been approved under the UN
11 Framework. And we'll have to continue to adapt and
12 potentially add more registries over time.
13 But I think it's the robustness of the
14 registry oversight itself that's important. We feel
15 confident in working and accepting the three that we
16 have is the right direction. We'll be looking to add
17 to that as this market evolves. But we rely on the
18 registries themselves and then their oversight of those
19 registries to be confident in the offsets that are
20 granted and the stability of that offset regime over
21 time.
22 CHAIR WIGGINS: Any other questions from

1 Associate Members?
2 MS. KNAUFF: I don't think we have question
3 from Associate Members.
4 CHAIR WIGGINS: I see we have one from Rob
5 Creamer as an EEMAC Member. Rob, please go ahead.
6 (Brief Pause.)
7 Rob, we're not hearing you.
8 MR. CREAMER: I'm sorry. Can you hear me
9 now?
10 CHAIR WIGGINS: Yes, we can. Please go
11 ahead.
12 MR. CREAMER: Okay. Sorry about that. I was
13 on mute on my phone as a a duplicate precaution, so
14 sorry about that. I forgot I had hit it. I was
15 curious if the panelists might speak to their own views
16 regarding the liquidity present in these markets. And
17 really thinking about kind of how the market is
18 evolving.
19 Certainly, it's interesting to me and I'm
20 wondering if there are any constraints in the
21 underlying market that are holding back liquidity from
22 entering maybe more participation, but just wondering

1 kind of everyone's views on that. Thank you.
2 CHAIR WIGGINS: Does anyone on the panel wish
3 to jump in to answer that question?
4 MR. BENNETT: I didn't get the first -- I
5 don't know if anyone else, but I didn't get the first
6 part of the questions.
7 MR. CREAMER: I was asking about the
8 liquidity, how you evaluate liquidity within your
9 markets, and whether you're pleased with the current
10 state of liquidity, whether it's at a healthy level.
11 Just kind of how you think about it, any constraints
12 that may be limiting the desired level of liquidity
13 that you'd like to achieve.
14 MR. BENNETT: So that covers any of our
15 markets so carbon allowances and so forth?
16 MR. CREAMER: The exchange derivative
17 allowances.
18 MR. BENNETT: Yeah, of course. So, liquidity
19 means different things to different people.
20 How do we look at it? If we look at it in
21 terms of the combination of bid-offer spread and depth
22 of market, clearing each of the cap-and-trade programs

1 on different stages of their evolution, the EUA is the
2 largest and the most advanced and has the most
3 liquidity, has the tightest bid-offer spread, and has
4 the deepest market, you know, we probably trade 40 to
5 50 million tons a day in EUAs in a tight bid-offer
6 spread. And the reason why EUA is the tightest in the
7 market and the deepest is because it's got the most
8 diverse liquidity pool.
9 So EUA as the first contract was really
10 developed into a benchmark in its own right, so it
11 attracts a lot more diverse participation and,
12 therefore, a diverse view of valuation, and that tends
13 to encourage more liquidity.
14 MR. SAMMANN: And Rob, I'll jump in from our
15 side. You know, we just launched our GEO futures
16 contracts in March, and it's based on the underlying
17 spot market is traded on an Xpansiv CBL platform.
18 That's a market that just started about 15 months ago.
19 Now, what's interesting is we all know the
20 beneficial relationship that exists between spot
21 markets or underlying physical markets and derivatives
22 markets. And in this particular case, we've seen an

1 extremely beneficial impact, in that we saw a real big
2 jump in the underlying spot turnover and Xpansiv CBL
3 market in the underlying offsets market, literally the
4 same week that we launched our futures contract.
5 And why is that? All the big -- bringing all
6 the benefits of a regulated, standardized, well-
7 organized, centralized market to connect to the
8 underlying spot market, that's very much going to be
9 beneficial two way impact there. So, we think that the
10 futures market has already brought more folks into the
11 markets looking more closely.
12 I will tell this group that next to probably
13 Bitcoin, our single most client-engaged sales campaign,
14 we've had has been on the GEO contract. We have had
15 interest across the entire financial player spectrum
16 from asset managers, hedge funds, pension funds,
17 liability managers, banks, market makers, folks that
18 aren't necessarily directly involved in this market,
19 yet a lot of producers that are not even energy
20 producers looking at ways they can use and adopt these
21 GEO contracts to offset their risk.
22 So, we think over time, those early stages of

1 development of this market, liquidity I think we
2 probably define it as you would; what's the entry-exit
3 cost, , how deep is that market, what's the top of book
4 look like, how easily can you move sizes, how
5 effectively are price fluctuations managed. Those are
6 all things that we look very closely at across all of
7 our markets.
8 I think we're at the early stage in the
9 development of this rapidly evolving space. I think
10 the important part is bringing in a fully regulated
11 market infrastructure and ecosystem to expand
12 participation, bring in some more natural sellers, and
13 bring in some more natural buyers as well. And I think
14 that's where we're going to see the beneficial impact
15 of building futures markets on the back of an evolving
16 spot market, but that actually bringing benefits to
17 both of those.
18 So, it's early days in our contract for sure.
19 And it's a different approach from the cap-and-trade
20 programs that you've heard from the other panelists
21 here. And I think there's a lot of interest that I
22 think is going to evolve. And that's what brings

1 people into the market.
2 So, we're excited about the feedback we've
3 gotten so far. Markets got a long way to go, but
4 there's no shortage of interest for what this can mean
5 to folks that are directly in the industry and those
6 that are looking to use an offset like this to manage
7 the global footprint -- carbon footprint they have
8 whether they're an aluminum producer or a farmer.
9 We're having all of those conversations with
10 commercial customers right now. So, the extensibility
11 of a product like this is what's most exciting to our
12 customers.
13 MR. SCHNEIDER: Yeah. And this is Christian.
14 Let me just add to what Gordon and Derek shared with
15 us, and I surely second that. Also, on the EEX, in
16 particular, for the EUA contract, which is the most
17 liquid contract in the carbon space for us as well, you
18 see more participants pouring in liquidity in terms of
19 depth of book and bid-ask spreads improving. But it's
20 also the way the markets trade. It's not only outright
21 trades. We see increasingly more time spreads traded,
22 carry trade between spot markets and futures markets,

1 rolling of contracts, and structured trade coming in.
2 So, this is for me also a sign for a maturing market
3 going its way towards a really liquid contract. Thank
4 you.
5 CHAIR WIGGINS: Thank you. Are there any
6 other questions from our EEMAC Members?
7 MS. KNAUFF: There's not any other questions
8 from the Members, but we do have a question from
9 Commissioner Berkovitz.
10 CHAIR WIGGINS: Okay. Commissioner, please
11 go ahead.
12 COMMISSIONER BERKOVITZ: Thank you, Dena and
13 Abigail. Thanks. So, I just want to follow up on a
14 question that is occurring in response to Rob Creamer's
15 questions on liquidity. I have two questions actually.
16 One is, Derek, you talked about this and you're
17 mentioning your underlying spot market. The first
18 question is, for these derivatives contracts, for all
19 these derivatives contracts, you need a well-
20 functioning spot market with price integrity in those
21 underlying spot markets.
22 So, I'd ask each of the panelists your work

1 or your interaction or exploration, or how to describe
2 with the markets themselves and its primary and
3 secondary markets, the authorities that allocate the
4 allocations to ensure price integrity of the underlying
5 product derivatives that settle to.
6 And then the second question relating to the
7 liquidity issue. Is there -- and maybe, Derek, you're
8 alluding to this, but if you could expand, to what
9 extent are these parts being used by just by the
10 participants, buyers, and sellers, entities that need
11 allowances or desire offsets? Or are there liquidity
12 providers such as banks, dealers, traditional folks who
13 are entities that would participate as market makers in
14 other commodity markets like oil and energy and
15 agricultural products, for example, the bank, the
16 dealers, prop traders? Is the liquidity at a
17 sufficient level that, they would be coming in?
18 Would this ultimately be an asset class, like
19 an underlying spot market? And then the second
20 question is, what type of liquidity? Are we just
21 having hedgers, or are we actually having speculators
22 and market makers? So, thank you.

1 MR. BENNETT: Hi there. So yeah, it depends
2 on which contract we're talking about. But as per my
3 previous answer, the EUA market looks like any other
4 benchmark contract, whether it's TTF, European natural
5 gas contract, or some other key commodity benchmarks
6 other than Brent or so forth, it has a very diverse
7 group of participants that we are interested in.
8 The uniqueness of a cap-and-trade program is
9 that it is a market that is set through policy and you
10 have people -- you have naturals who have to
11 participate in the program. So, it's a great source of
12 natural liquidity because people have to buy allowances
13 if they're short. But there's a whole host of
14 participants in the EUA contract whether it's banks or
15 non-bank financials. So, I would say it's as diverse
16 as any benchmark contract that we have.
17 And what we saw in sort of post-2018 in
18 anticipation of the introduction of the MSR, the market
19 stability reserve, we saw this gradual increase in
20 pricing in EUA. And the performance of EUA was in the
21 financial press but even in the mainstream press. And
22 so, you know, carbon as an asset class really started

1 to become -- stick its head above the parapet and
2 became a bit more mainstream. And that’s how the
3 trickle-down approach, whereby, you know, people are
4 saying, "This EUA contract is performing strongly.
5 What is it? And what else is there out there?" So,
6 then you get this trickle-down effect into things like
7 CCA and RGGI off the back of it. They're not as
8 diverse as an EUA, but certainly, CCA is catching up.
9 And RGGI is probably the least diverse of these two
10 contracts.
11 And we're seeing it in the UK allowances as
12 well. We're only two weeks in, and so it's very -- at
13 the beginning, it seems very much natural focused, so
14 people that have to buy allowances or have extra to
15 sell. But I am sure that that will evolve like our
16 other carbon contracts.
17 And in terms of spot versus futures, it's
18 sort of the same thing in terms of carbon. So, the
19 thing about carbon markets, we allow these markets as
20 you're complying once a year. So, the contract is
21 basically is named after the current compliance year,
22 so let's call it 2021. In Europe, it tends to trade at

1 December 2021. But that being delivered for the
2 compliance period 2021 is being delivered in April
3 2022.
4 So, you don't need to buy a spot contract
5 necessarily here and now because you're only complying
6 in the future. But some people do buy the spot. It's
7 called the daily future, and you pay for full contract
8 value, and you get delivery of your allowance. Whereas
9 the future is margined as you would expect a normal
10 futures contract. And I think as Christian said that
11 we do see a carry trade in most carbon markets where
12 people are buying the spot and selling the future and
13 generating the yield. So that's where you tend to see
14 a lot of spot activity.
15 And then finally, in terms of primary
16 markets, we, both EEX and ourselves, operate auctions
17 for governments, and that's another great price
18 discovery tool, but that's also the spot market because
19 the government is selling their allowances, and they're
20 being paid for today, and they're being delivered
21 today.
22 MR. SAMMANN: And maybe I'll jump in on some

1 of the other pieces. So, Commissioner Berkovitz,
2 you're asking about the spot market. So, in the case
3 of the voluntary offset market, the GEO contract, think
4 about that the market that is run by CBL as a spot
5 market. That's just a transactional venue.
6 So, when you think about -- the carbon credit
7 registries are actually the verification agents
8 themselves for the physical credits, they're being
9 approved by the UN agency that sets the standard. So,
10 as we talked about the standards and set are approved
11 by the registries that are in-turn approved, and that
12 is by the United Nations entity that oversees that.
13 So, think about the underlying transactional volume
14 that's flowing through CBL on the spot side and then
15 our future progress based on that. So, we know that if
16 you track back the validity of the registration, the
17 underlying credits themselves, that rolls up to that UN
18 framework.
19 So that's kind of how that market operates.
20 We've seen that. They've been operating for 15 or 18
21 months right now. In fact, their growth has been
22 substantial. You asked a really good question in terms

1 of the market participants. There was a slide in my
2 materials and Abigail if you wouldn't mind pulling it
3 up. And the title of the slide is What Is a Carbon-
4 Neutral Cargo?
5 And when you look on there, these are all
6 public announcements, so we're not providing anything
7 that has not been announced by these underlying
8 entities themselves. But there's a table there under
9 the title What Is a Carbon-Neutral Cargo? that lists
10 the eventual buyer and the eventual seller of that
11 underlying contract. And you'll see for 90-plus
12 percent of those right now, those are the underlying
13 commercial entities themselves. There's Shell, there's
14 Mitsui, Total, Chinese entities, and Toho Gas, et
15 cetera.
16 So right now, and -- but remember, this is a
17 futures contract. So, the initial buyer and the
18 initial seller, when it goes to physical delivery, you
19 don't know how many transactions and maybe a financial
20 player that took place in between there as well.
21 Where our goal is to have started with the
22 most robust, UN-enabled framework at the outset, the

1 one that the industry is coalescing around, making sure
2 those products most effectively represent the
3 underlying risks and actually the opportunities to
4 monetize some of these offsets that are out there. And
5 under the UN framework that makes that the right global
6 framework for being able to have fungibility
7 transferability between regions across jurisdictions,
8 state national, local, and otherwise.
9 The participant pool over time. We fully
10 expect as we've been doing for 160 years, expand that
11 ecosystem of participants. That's where the best
12 possible outcome for everybody is, where you have
13 commercial end-user, open interest holders alongside
14 financial participants and players. And with that --
15 that's where I've actually seen the most interest from
16 asset managers and hedge funds saying, "Hey, we've long
17 thought about this. We haven't really found a way in.
18 We're not part of cap-and-trade program because we're
19 not the underlying entities themselves, but having
20 participated in this market in a way that's well
21 regulated, and it has all the safeguards of the CFTC
22 jurisdiction."

1 So those are the feedback pieces we're
2 getting from customers on the client-side, then how do
3 we become a part of this? So that table and if it
4 doesn't come up on the screen, that's fine. It's in my
5 materials under the heading, What Is a Carbon-Neutral
6 Cargo? There's an opportunity to see what today's
7 participant pool looks like. In our experience, that's
8 going to look very different in three to five years'
9 time. You're going to see more intervening financial
10 players participate along that chain. You might end up
11 with still largely the original seller and the final
12 buyer might end up being financial or commercial
13 participants. But that's a function of how well we can
14 scale the community and participant pool.
15 CHAIR WIGGINS: I think we have questions
16 from the Chairman and from Commissioner Stump.
17 Chairman, would you?
18 ACTING CHAIRMAN BEHNAM: Commissioner Stump
19 can go first, please. I’ll go after her.
20 COMMISSIONER STUMP: Thank you. My question
21 is for Derek. I -- this is just -- I know the focus of
22 today's meeting is energy, but I have heard from

1 various agricultural interests, who themselves are
2 designing voluntary solutions in the primary phase.
3 And some of them actually maybe offset issuers based
4 upon the manners in which they're able to capture and
5 contribute to carbon reduction.
6 I'm just being curious. When we talk about
7 UN standards-setting -- UN-recognized standard-setting
8 bodies such as CORSIA, have -- has there been interest
9 or discussion with agricultural end-users as to what
10 type of things should be recognized in that space? And
11 perhaps not given that agriculture hasn't been the
12 focus of the mandatory programs, but I'm just curious
13 more than anything as to -- if we know if those
14 conversations are ongoing with agricultural end-users
15 or agricultural anyone who's interested in the
16 agricultural markets from that perspective.
17 MR. SAMMANN: Yeah, you know, Commissioner
18 Stump, that's a great point, and I kind of alluded to
19 this in my prepared remarks. Given the fact that we
20 run the world's largest agricultural market and
21 actually in the metals market as well, we have a lot of
22 natural interest in the commercial participants in both

1 of those markets. I'll give you two examples.
2 All of the ABCDs, right, the biggest agri-
3 food business entities on the planet, have been deeply
4 engaged with us on this because they're pretty far down
5 their own path, whereas carbon sequestration efforts or
6 other ways in which they either are emitters or in some
7 cases are the natural longs, the owners of these
8 offsets themselves, as they're looking to do a few
9 things. Or we have in some cases the ABCDs themselves
10 have access to or made purchases in the space that
11 create those offsets. They want to know how they can
12 go about using those not only for their own business
13 but maybe to be participants and provide an offset
14 against, say, an energy producer.
15 So, the short answer is yes. And there are a
16 handful of within that group of four or five in that
17 group. There's two or three that are most aggressively
18 pursuing this because they'd like to be involved
19 earlier, sooner rather than later in this market as it
20 evolves.
21 There's another set of participants from the
22 mining side, mostly from the base metals side, less on

1 the precious metal side, because you know how energy-
2 intensive mining is for things like copper and
3 aluminum. And they said, "Listen, this directly helps
4 us down the path to our own carbon-neutral commitments
5 because what we do is a very energy-intensive business.
6 How can we find a way to use these products to offset?
7 In the same way that we use the example -- the
8 materials for a carbon-neutral cargo, there's carbon-
9 neutral aluminum. There's carbon-neutral corn. There
10 can be carbon-neutral copper. And those are the
11 conversations we're having.
12 Since we've run the benchmark markets in
13 those asset classes, it's been -- that's why this has
14 been such a deep and deeply engaged sales campaign over
15 the last three months because customers can see a
16 potential immediate need in their own business to meet
17 their own commitments in carbon neutrality. And they
18 see if they're able to do that on the same exchange
19 with the gender primary hedging for their natural
20 underlying exposure.
21 So, the opportunities and we all talk about
22 ecosystems and the most efficient way to bring networks

1 of market participants together, that's the
2 conversation that we're having. So, I gave you the
3 long answer. The short answer is yeah, both from the
4 agricultural side and from the industrial metal side of
5 our own customer base, saying, "How can you use these
6 products?" And they're both pursuing and getting
7 engaged in the markets right now. But also, would like
8 to see these markets continue to evolve with more
9 liquidity, more term open interest out along the curve.
10 And that's just the market maturation process. And
11 that's what we do. We build markets and bring
12 communities together. So, I think we'll see more of
13 that over time.
14 COMMISSIONER STUMP: But are there
15 international bodies that are recognizing or focusing
16 on recognizing the -- or validating perhaps the types
17 of things that would qualify as offset in those spaces?
18 And Derek, this may not be a fair question for you,
19 that's not your job, but I'm assuming that you're
20 looking to those folks as you would in the energy space
21 to help develop the market.
22 MR. SAMMANN: Yeah. And again, the answer

1 comes back to the registry. So, what happens is if
2 somebody has something they think is an offset, they
3 actually go through an application process through one
4 of the registries themselves. The registries
5 themselves look at that, they review the application.
6 They determine yea or nay. Those registries, those
7 eight that I referred to under CORSIA that fall under
8 UN mandates, so that is the kind of uber supranational
9 entity that provides the overall frameworks for the
10 oversight of the registries. Individuals like -- I'll
11 pick a -- I can't pick an individual name.
12 A large agricultural company would say, "Hey,
13 I think I've got this part my business that I think
14 qualifies as an offset." They would go to one of the
15 registries and apply for that, and then they'll run
16 through that process. And that's a very thorough
17 vetting process of within the registry itself oversight
18 by the UN.
19 So, I think the answer that you're looking
20 for is yes, those are globally accepted standards.
21 Now, that was birthed originally out of the aviation
22 industry, but those standards are looking applicable to

1 across all industries. An offset is determined to be
2 an offset by the entity that the UN approves it to be.
3 So that's the process, I think, that we're pursuing
4 right now.
5 COMMISSIONER STUMP: Thank you.
6 MR. SAMMANN: Apologies.
7 COMMISSIONER STUMP: No problem. Thank you
8 very much.
9 CHAIR WIGGINS: Chairman Behnam?
10 ACTING CHAIRMAN BEHNAM: Thanks, Dena. No, I
11 won't -- this has been a good Q&A session. So, in the
12 interest of time, because I know we're way over, I'll
13 just make a short thought because my questions have
14 largely been asked and answered. But I think the
15 points about the underlying market are really
16 interesting and difficult. And, you know, as was
17 mentioned, the fact that you have non-end users, non-
18 speculators trying to get exposure through the futures
19 is not unlike what we're seeing in the Bitcoin or the
20 crypto space because of that trust, because of that
21 regulated space.
22 And I think given the scope and the scale and

1 the ambition with the carbon markets and the offset
2 markets and what everyone's trying to achieve in terms
3 of climate change, it's going to be important to really
4 make sure that these registries are valid and credible.
5 And I know certainly CME does its homework to ensure
6 that their futures are based off of credible underlying
7 cash markets. But, you know, these cash markets are
8 essentially OTC derivatives markets. And I think it's
9 going to be interesting as time goes on that we as CFTC
10 and other government regulators, as this public-private
11 partnership evolves, play a good role because we've
12 learned a lot of lessons in the crypto space. We've
13 learned lessons in the RIN space.
14 Given the ambition and the scale, we have to
15 make sure we get this right because the outcome and the
16 deliverables are really what we're trying to achieve.
17 So, all in there, great panel, and back to you, Dena.
18 CHAIR WIGGINS: Thank you very much. And I
19 am now going to turn this over to Abigail. Abigail?
20 MS. KNAUFF: Thank you, Dena. At this time,
21 the EEMAC is going to take a brief break. EEMAC
22 Members, Associate Members, guest panelists, and the

1 Commissioners, please keep your phone on mute. Make
2 sure your WebEx is on mute and turn off your video
3 during the break. We'll return at 12:35 p.m. to begin
4 the next panel. Thank you.
5 (A luncheon recess was taken at 12:23 a.m.)
6
7 A F T E R N O O N S E S S I O N
8 (12:37 p.m.)
9 Ms. KNAUFF: I would like to call the EEMAC
10 meeting back to order and turn the agenda back over to
11 Dena.
12 CHAIR WIGGINS: Thank you, Abigail. Our
13 third panel today is going to provide a survey of
14 perspectives on carbon derivatives and the underlying
15 markets. We're going to hear from Evan Ard who's an
16 Executive Managing Director of Evolution Markets, Inc.;
17 Suzi Kerr, the Chief Economist at Environmental Defense
18 Fund; Erik Heinle, the Assistant People's Counsel at
19 the Office of the People's Counsel for the District of
20 Columbia.
21 And I will also participate on this panel as
22 the CEO of the Natural Gas Supply Association along

1 with Annette Nazareth, the Senior Counsel at Davis Polk
2 who's representing today on behalf of the Taskforce for
3 Scaling Voluntary Carbon Markets. And then finally,
4 Matthew Picardi, the Vice President of Regulatory
5 Affairs with Shell Energy North America, who is
6 speaking on behalf of the Commercial Energy Working
7 Group.
8 So, with that, I'll turn it over to Evan.
9 MR. ARD: Great. Thanks, Dena. And also,
10 thanks to Commissioner Berkovitz for inviting me to
11 speak, Acting Chairman Behnam, Commissioner Quintenz,
12 Commissioner Stump as well, as the EEMAC Members and
13 Associate Members for convening this discussion. It's
14 been a great discussion so far. I will try to not go
15 over some of the same ground that was covered by the
16 panels before me, particularly the last panel with the
17 -- with that great discussion from the different
18 exchanges.
19 Just quickly, Evolution Markets is an
20 introducing broker in global energy and environmental
21 markets. We've been involved in carbon markets since
22 our founding in 2000 and through the different

1 iterations of the markets. You've heard a lot of the
2 history from previous speakers. We are facilitating
3 transactions on behalf of our clients and futures, but
4 as well as in the OTC market.
5 And for the presentation today, I wanted to
6 focus strictly just on the OTC market perspective, give
7 the committee and the Commission a few ideas in terms
8 of how the carbon market has evolved and continues to
9 evolve in some of the overlapping issues that you might
10 want to think about going forward.
11 So next slide, please. Thank you. So again,
12 I think it's important to, when we talk about the OTC
13 market, to give all the participants, you know, in the
14 meeting today an idea of kind of where the market's
15 going and also present some ideas on what the
16 Commission might want to think about as it looks at the
17 future, you know, regulatory action or oversight, in
18 particular, in carbon markets. You know, a lot of ways
19 the OTC market and carbon has evolved like many of the
20 other environmental or energy markets, you know, and it
21 is a precursor to what goes on in some of the regulated
22 environments, but there's a lot of differences as well.

1 So, I figured we could go over some of that.
2 You know, obviously, the carbon market and
3 the OTC market has always been an incubator. The
4 market has traded -- the different regulated markets
5 have traded OTC well in advance and then trading
6 through the regulated exchanges. It's no different
7 today than it was when we first traded the European
8 Union allowances. I think we facilitated the first
9 trade maybe 18 months before the program even started.
10 It allowed counterparties to understand what the
11 potential trading mechanism was going to be, what the
12 deliver -- how the delivery was going to be managed.
13 Obviously, price discovery was part of that
14 as well. And even just some of the taxonomy and the
15 vernacular about how the market operates was, you know
16 -- is kind of worked out in advancing the OTC market.
17 We also facilitated some of the first transactions in
18 California as well as in RGGI. Again, those are well
19 in advance of the markets starting as well as in
20 advance of them, you know, trading on the regulated
21 exchanges.
22 And the market participants that you would

1 see early on were compliance entities but also a lot of
2 dealers, other financial entities that were providing
3 risk management services. The OTC market has also been
4 a tool for innovation and risk management. They have,
5 you know -- participants have used the OTC market to
6 tackle a lot of the difficult, you know, risk
7 challenges that carbon markets present. You know,
8 options obviously, started at OTC a while in advance of
9 the trading on the exchange. And you have a lot of
10 dealers who were looking to help companies manage their
11 compliance risk. And then, you know, there have been
12 the associated price risks and environmental risks that
13 are associated with those positions.
14 In addition, the offset market presented some
15 unique challenges, particularly as it relates to the
16 structure of the underlying -- as the underlying
17 product was being sold. In some cases, you know, you
18 wanted participants to guarantee the delivery and you
19 saw a lot of these structures that were created in the
20 OTC market eventually adopted for exchanges when they
21 listed contracts. CCOs in particular were a market
22 that the OTC market was particularly helpful in

1 developing in part because of the authority of
2 California to invalidate credits on carbon offset
3 credits that were generated and used by entities for
4 compliance.
5 So, the OTC market created different
6 structures and different tiering of risks that was
7 associated with the CCOs. And those markets traded for
8 years OTC before there was an exchange-traded contract.
9 It gives you a good idea of how the OTC market can
10 create some innovation and ultimately gets adopted by
11 the wider, you know, regulated market environment.
12 Next slide, please. So currently, there is
13 an active OTC derivative market for carbon. We heard
14 from previous speakers that with the exchanges, you
15 know, obviously, there's a robust, futures market as
16 well as an options market. The market -- both those
17 markets started OTC. Most of the liquidity migrated
18 over to the exchanges, but there's still a great pool
19 of liquidity underlying these markets, particularly in
20 the established compliance program.
21 You know, largely they're dealer-to-customer
22 transactions that are happening, the structure of those

1 trades largely mirrors the exchange cleared market.
2 But you'll see some very specific and bespoke
3 transactions that take place for -- you know, to
4 address specific client needs. And obviously, the
5 exchange-listed contracts provide a venue for hedging
6 of the OTC positions that, you know, these dealers or
7 some of the other market participants might take, you
8 know, in the OTC market.
9 There's also a very mature OTC market for
10 spot and forward delivery. You know, because of the
11 nature of carbon allowances and carbon offsets,
12 delivery is easy; it's effectively electronic delivery.
13 If you take physical delivery, it's just the movement
14 either in a tracking system or in a registry from one
15 counterparty to the next. You would see a lot of OTC
16 forward transactions that take place, you know, in the
17 netting of positions, you know, sometimes under ISDA
18 agreements and other type of event agreements and other
19 type of agreements between counterparties.
20 There's also new carbon trading platforms,
21 some of which have been alluded to already, including
22 Xpansiv CBL markets. There's also Carbon Trade

1 Exchange as well as the AirCarbon Exchange, different
2 venues for effectively spot delivery. And they provide
3 a great pool of underlying liquidity for trading for --
4 you know, obviously, for immediate delivery, sometimes
5 for forward transactions and a good venue for
6 transparency. And for the, you know, like I said,
7 there's an incubator for the development of products
8 before they migrate into an exchange environment.
9 Next slide, please. We had a fair amount of
10 discussion already this morning about the carbon offset
11 market. This market is tailor-made for the OTC.
12 There's just a lot of moving parts, in particular --
13 you know, and a lot of unique risks that are associated
14 with not only the market but also with individual
15 projects. And the ecosystem that's built up around it
16 is diverse. And so, you know, the OTC market is, you
17 know, it’s done a good job in terms of, you know,
18 bringing all these disparate parties together and all
19 these disparate risks together to offer transactions.
20 Largely, we're seeing in the carbon offset
21 market spot trades for physical delivery. There is a
22 fair amount of forward purchases of long-term strips of

1 credits. And then obviously, we have exchange-listed
2 products, particularly in California, for offsets as
3 well.
4 The one thing I think is important to note is
5 that despite the fact that there are common
6 methodologies and that there are registries that are
7 internationally recognized that, essentially write the
8 rules for how you reduce carbon emissions and then the
9 rules for how those are verified, validated, and
10 potentially issued. And when they're issued, how they
11 move between one counterparty and another.
12 There's still a lack of standardization
13 particularly for anyone who's on the buy-side of that
14 transaction, who's buying carbon offsets to potentially
15 offset their own carbon emissions to meet net-zero or
16 carbon-neutral commitments. It is truly like the art
17 market. The beauty is in the eye of the beholder.
18 Transactions occur with wide price disparities because
19 of carbon offsets may, you know, may -- one party may
20 desire a certain geography or product type or may want
21 products or projects that have additional ancillary
22 benefits for the environment or for social good, and

1 they pay more for those than another party would.
2 At the same time, you can see a landfill gas
3 project in Latin America potentially trading to a
4 discount to a landfill gas project in Africa, for
5 instance, just because the buyer sees more value or
6 wants to tell the story of investing in a particular
7 geographic area or in a particular project type.
8 And because of that a lot of the managing of
9 the risk occurs through the contract -- through
10 contracting. You know, there's optionality built into
11 contracts which relate to volume and as well as price.
12 And, you know, a lot of times you'll have unit
13 contingent transactions where, you know, the buyer will
14 buy up to a certain matter. All the credits coming
15 from a project, if and when those credits are created,
16 to kind of manage the risk associated with the
17 performance of a particular carbon offset project.
18 And because of that, you see a lot of
19 counterparties taking -- managing the risk, you know,
20 in large part through -- also through diversity. So,
21 they're going to invest in carbon portfolios that are
22 going to have, you know, being different methodologies,

1 be across different geographies, be in different
2 vintages, and vintage being the year in which the
3 carbon emission was achieved.
4 And then you also see further kind of out the
5 chain, you'll see counterparties who are sharing the
6 risk associated and also sharing the upside with the
7 seller by co-marketing. Some might buy offsets for
8 future delivery at a set price. And then sharing any
9 future upside of an on-sale of those credits with the
10 issuer or with the project owner which is becoming more
11 common these days.
12 And you'll also see for new project
13 development that there's a certain continuum in the way
14 that these projects are developed, that is indicative
15 of some of the risks that are out there and where the
16 market itself has stepped in to address these risks and
17 where there's more work to be done.
18 So, the offtake agreement would be, you know,
19 the purchase of multiple-year streams of offsets from a
20 project that's going to reduce carbon emissions
21 wherever it is in the world in whichever registry it
22 happens to register on. And that offset -- the offtake

1 agreement, similar to what happens in renewable energy
2 markets, can then be turned around from the project
3 developer to a bank or to some other financial entity
4 to achieve project financing, if necessary, to put the
5 steel on the ground. The capital expenditures
6 necessary to start the project.
7 And then naturally after that, whoever's
8 involved from a financial point of view is going to
9 want to engage in hedging. And this is where the
10 market is still evolving. The managing risk of
11 contracting takes you to a certain point. And then
12 beyond that, you know, there's obviously hedging
13 instruments that are necessary out there. And right
14 now, especially for carbon offsets, you know, there's
15 currently few, you know, viable products out there to
16 do that although they're being developed as we've
17 talked about, from the CME and from some other venues.
18 Can you go to the next slide, please? In
19 terms of what this committee and the Commission should
20 think about the carbon markets going forward, I think
21 it's important, and this has been alluded to, you know,
22 previously, to try to take a step back and look at the

1 holistic impacts of climate change on energy and
2 environmental markets, not just the carbon markets.
3 And this is something that the climate-related risk
4 subcommittee of the Commission has already started to
5 address.
6 And extreme weather events, you know, can
7 obviously lead to price volatility. They can raise
8 some market structure issues. And I think more
9 importantly, in the long term, is they are -- you know,
10 they are leading to shifts in liquidity, you know, the
11 shift to carbon neutrality. In some cases, you know,
12 net-zero commitment is leading to a shift in terms of
13 where liquidity is based in a lot of energy and
14 environmental markets, you know? And that includes not
15 only the underlying commodities but also the venues and
16 risk management products that come off the back of
17 that.
18 A good example is the shift in liquidity in
19 power natural gas markets in the States, you know,
20 because of the shift in generation mix away from coal
21 to natural gas and with more renewables on the grid.
22 There's more liquidity and more in the basis markets

1 than there was previously, especially relative to the
2 major hubs.
3 And then we're also seeing an emergence of
4 global LNG markets which is, you know, a direct
5 response to the climate challenge as people will use
6 natural gas as a transition fuel to a true low-carbon
7 and net-zero economy. And you're also seeing the
8 emergence of renewable energy certificate markets which
9 are regulatory tools to enhance -- to make renewables
10 more competitive as they, you know, continue to develop
11 and get scale here in the United States. You're also
12 seeing it abroad.
13 There's also emerging trading strategies that
14 different counterparties are putting on relative to
15 climate change that's going to kind of amplify these
16 trends going forward. We have conversations with
17 clients daily, be they banks, companies with national
18 positions, hedge funds that are looking at climate
19 impacts on a global basis, and how it impacts their
20 putting trades on that are relative to those impacts
21 will show the short term and long term.
22 And I think it's important to note that

1 carbon pricing is going to play an important role going
2 forward. You know, in all the global commodity energy
3 markets and certainly some of the other global
4 commodity markets, as carbon gets priced in either from
5 a regulatory perspective or just simply from end-user
6 consumers pricing in carbon as part of the
7 externalities of using fossil fuels.
8 Next slide, please. So, for my last slide, I
9 wanted to highlight a bit in terms -- if we're kind of
10 forward-thinking from the Commission’s point of view.
11 And, you know, encouraging everyone to look at this.
12 So this has been discussed a little bit previously more
13 of an intersectional approach in terms of how we look
14 at energy and environmental markets.
15 There is, you know, a robust carbon market as
16 we've discussed. Obviously, energy markets are robust
17 as well. But now, we're seeing how these are – there's
18 an interplay between these and there's new products
19 that are being developed that are addressing a lot of
20 the underlying environmental issues that we're talking
21 about with climate change, whether it be on a voluntary
22 basis, companies taking on net-zero commitments and

1 turning to their scope one, two, and three emissions in
2 order to, you know, manage that and meet net-zero,
3 carbon-neutral commitments, or if it's, you know, on a
4 policy level as well.
5 So, from the carbon market, which we've
6 already talked, there's compliance markets -- there's
7 new compliance markets being proposed on a global
8 level, almost on a monthly basis at this point. You
9 also have different U.S. states that are looking at
10 taking approaches, and they may join in regional
11 approaches in California or in RGGI, or they may take
12 on their own carbon pricing regimes that are outside of
13 those particular approaches.
14 And increasingly, all these policymakers, as
15 was discussed in that first panel, are looking at
16 potential linkages as a way to create efficiencies and
17 to promote carbon emission reduction targets across
18 different sectors or across different geographies.
19 The global carbon offset market is growing as
20 we've all discussed. We anticipate that we're going to
21 see significant amount of growth over the next five
22 years in that market. And the policymakers are

1 starting to look to the carbon offset market again, as
2 a way not only to reach carbon goals to do it on a
3 cost-efficient basis. And you're seeing now a
4 discussion within the EU about potentially, again,
5 bringing carbon offsets back into the program
6 potentially in future years when the carbon offset
7 targets in the EU get more strict. California already
8 has a robust program with carbon offset usage limits,
9 and that will continue going forward.
10 And then lastly, on the international level
11 is discussion of, you know, potentially global carbon
12 markets coalescing around the Paris Agreement and
13 different mechanisms under the Paris Agreement to
14 provide for increased ambition as well as meeting, you
15 know, globally, nationally determined climate goals.
16 So particularly, you'll hear people refer to Article 6
17 of the Paris Agreement, which allows for the
18 international carbon market to formulate.
19 And, you know, also, there's a fledgling
20 market that starting from a carbon offset -- from a
21 sustainable development point of view. You're also
22 seeing, as people talked about, bundling of carbon

1 offsets with fuels. And lastly, there's this separate
2 market that's, you know, coming together that's
3 differentiating fuels that are -- produce less carbon
4 intensity than others. And again, this is all going to
5 have an impact on the underlying energy commodity as
6 well as the environmental market itself.
7 So, with that, I appreciate your time, and
8 that's it for my presentation. Thanks, Dena.
9 CHAIR WIGGINS: Thank you, Evan. Suzi, I'll
10 turn this over to you.
11 MS. KERR: Thank you very much. So, the
12 interaction between cap-and-trade markets and financial
13 markets is a critical one to enable the efficient flow
14 of capital to low emissions investments in response to
15 policy. And as they grow in size and value, cap-and-
16 trade markets can also create some risks. I'm really
17 grateful for the opportunity to discuss these issues
18 today with such a knowledgeable group. So those of you
19 who are less familiar with us, the Environmental
20 Defense Fund is very proud of basing all of its
21 advocacy on strong economics and science, and we work
22 closely with many private companies.

1 Next slide, please. I want to touch on four
2 issues, getting back to really the fundamentals. So
3 first thinking about what really drives cap-and-trade
4 prices and particularly focusing on the extent to which
5 those are actually driven by policy. Second, I want to
6 discuss how cap-and-trade prices lead to clean
7 investment and some of the challenges in that
8 connection. Third, I want to touch on a very big issue
9 recently around environmental justice and equity
10 concerns and what that can mean for risks around cap-
11 and-trade prices and markets. And finally, discuss
12 three big changes that are coming where there's a lot
13 of uncertainty, but they could have really enormous
14 impact on the accessibility of particular types of
15 units and on the prices of those units.
16 Next slide, please. We're going back
17 absolutely to basics. What's driving carbon prices is
18 of course a mixture of the demand and supply. So the
19 demand for reductions or the demand for allowances in a
20 compliance market is essentially the mirror of a
21 marginal abatement cost curve. And it depends very
22 much on how much emissions would have been in the

1 business-as-usual case or when there is no regulatory
2 pressure to reduce. That's a very highly uncertain
3 thing, but that's a critical input.
4 Next slide, please. So, the second piece of
5 the puzzle is the cap. And that is the supply of the
6 allowances set entirely by a regulator. And for the
7 price in the market, because these units are bankable
8 across periods, you can trade across time periods, it's
9 not only the current cap that matters but also the
10 expected future stringency of the cap. If you expect
11 the cap to become tighter in future, you'll hold back
12 now and save some of those units. And the -- because
13 you can bank those units, unanticipated changes in
14 expectations about the future can have quite dramatic
15 short-term impacts on prices.
16 The next slide. So, the stringency of that
17 cap is dependent on political will. That political
18 will in turn depends in part on perceived feasibility
19 of reductions and costs. It also depends on
20 international diplomacy. So it depends on what's
21 happening in international agreements but also what's
22 happening more generally in international climate

1 negotiations and culture among companies even. And
2 sometimes, it's not only the stringency of the program
3 that is at stake politically, but even the existence of
4 the program, and of course, that would have a very
5 dramatic effect on the value of the units. So, if the
6 cap either becomes or is expected to become more
7 stringent, that's going to push up the prices.
8 Third slide. Next slide, sorry. The other
9 really important driver which is unusual relative to
10 purely private markets is that other climate mitigation
11 policies are very important in terms of the demand for
12 allowances in the market. If there are other climate
13 mitigation policies such as requirements for clean cars
14 or innovation support or building of critical low-
15 emissions infrastructure, that will reduce the
16 emissions even irrespective of the cap-and-trade
17 program, and it may reduce the cost of further
18 reduction.
19 So, it shifts that marginal abatement cost
20 curve, and that shifts the demand for allowances,
21 lowering the price of allowances in the cap-and-trade
22 market. So, when you're thinking about the prices in

1 cap-and-trade, you need to be considering the whole
2 portfolio of policies.
3 Next slide. So, the sense that there's a lot
4 of uncertainty in this demand means that there's a lot
5 of uncertainty in the cap-and-trade prices. And that
6 uncertainty comes from the policy but also from the
7 normal sort of market activities and the changes in
8 technology, demands for fuel, et cetera.
9 Next slide, please. In part include concern
10 about dealing with that uncertainty because we find it
11 so hard to predict what those marginal abatement cost
12 curves would be. Nearly every cap-and-trade program
13 now has some sort of price management. So, I've sort
14 of drawn one possibility which is a price band, a floor
15 in the auction, and a price ceiling so that prices
16 can't get too low, and they can't get too high. And
17 this provides some protection also against speculation
18 that a market might actually be about to collapse when
19 the regulators don't want that speculation to come
20 true. So altogether, there's a number of policy
21 instruments that are seriously driving the prices in
22 these markets.

1 Next slide, please. So, as well as normal
2 market sectors, policy, politics, and even
3 international diplomacy are driving these prices which
4 means they are creating a very specific form of risk
5 for asset prices from these markets.
6 Next slide. So just to look at the EU
7 experience, this is the experience over the first pilot
8 period and the EU system since then. There's been
9 enormous variation in these prices. There's a lot of
10 short-term volatility, but those long-term changes are
11 to do with changes not only in the global economy but
12 also very much an expectation for policy stringency.
13 Other carbon markets such as the New Zealand one, which
14 I was heavily involved in creating, show very similar
15 patterns of prices over that long period in time. So,
16 what does this mean for investment?
17 Next slide, please. The key purpose of cap-
18 and-trade programs is to influence investment, low
19 emissions investment, avoid the high emissions
20 investment. We want investors to be able to share and
21 lay off risk so that they can invest efficiently and so
22 they can invest as fast as we need them to do.

1 Essentially, our cap-and-trade allowances are a form of
2 currency that is created by the regulators. And what
3 we're wanting to do is to be able to trade that
4 currency, hedge that currency, et cetera, in such a way
5 that people can seamlessly make these trades.
6 So, I think there are some fundamental
7 questions here about who has the best ability to trade
8 with. And I wonder, I'm not an expert in financial
9 markets, but in some aspects, this is a little more
10 like foreign exchange markets than some other product
11 markets. I also think that policy uncertainty is a
12 little different from concerns about volatility in
13 markets. And the ultimate goal is to reduce the policy
14 uncertainty -- manage the policy uncertainty in maybe
15 like monetary markets, then have some changes in the
16 way we govern the creation of this currency of cap-and-
17 trade allowance units.
18 Next slide, please. So, another issue that
19 has become very important recently is environmental
20 justice and equity concerns. And this takes a number
21 of different forms. It can create policy risk, and
22 that policy risk then creates price risk.

1 So, the first cause of concern is around the
2 use of market solutions in general for dealing with
3 climate policy. And those concerns are several. So,
4 there's concern about procedural approaches, loss of
5 local control. When we use markets to address
6 problems, there are distributional concerns that carbon
7 pricing would have an impact on workers on consumers.
8 Of course, it also has impacts on asset owners. And
9 there are concerns about market manipulation and poor
10 management of markets.
11 It isn't clear that these concerns and
12 challenges are unique to cap-and-trade, but they are
13 coming up very strongly in that context. There are
14 some solutions to this that are being demonstrated by
15 some of the people on this call: more inclusive
16 governance, some simultaneous policies to manage local
17 benefits. But we're still experimenting with those
18 approaches. Washington's cap-and-trade system is an
19 interesting one where they've got two new approaches to
20 deal with a set may make cap-and-trade more acceptable.
21 We also learned a lot about guardrails to avoid the
22 market manipulation. So, price protection, auction

1 purchase limits, strong registries, et cetera.
2 Next slide, please. The other concern that
3 can arise around equity, and this is something that we
4 have seen in New Zealand markets, which involves some
5 very small forestry players who are part of our cap-
6 and-trade market, is that when you have small sellers,
7 they can be exposed to unnecessary risk. And because
8 these markets are complex, not many people understand
9 them, it's very easy for people to fall prey to snake
10 oil merchants.
11 This was particularly true in the nature-
12 based solution space. So, as we move more into that
13 space, with either offsets or regulatory programs, we
14 might need to pay more attention to this. One of the
15 unusual things about nature-based solutions is that you
16 can create liabilities because you're storing carbon in
17 soil or in forests. And if that carbon gets released,
18 there can be a liability associated with it. There are
19 again approaches to dealing with that that are
20 developing, but those are still an area where I think
21 more development is needed.
22 So, in summary on the equity issue, they

1 still pose real risks of the existence of and a
2 reliance on cap-and-trade markets, particularly in the
3 United States. And therefore, I think they constitute
4 potentially a major source of price risk.
5 Next slide, please. So, going forward, there
6 are three main areas where I think we're going to see
7 very big changes. The first is that we really hope
8 that prices are going to rise. We've seen dramatic
9 rises in the EU and New Zealand markets recently. So,
10 when we're not successful at getting these markets
11 working with more realistic prices, we're likely not be
12 solving the problem.
13 The second is that international carbon
14 markets are evolving. It has been happening for 25
15 years. I've been working on it for 25 years. It's
16 still a space that is not particularly clear. But as
17 they do evolve and we have to make them work, that's
18 going to affect domestic cap-and-trade prices, but it's
19 not clear how that's going to happen, and that will
20 need to be watched closely.
21 The third is the surge in voluntary markets
22 and how those are going to operate alongside cap-and-

1 trade markets. And as cap-and-trade markets expand,
2 which they are doing rapidly across countries,
3 expanding their scope, that's going to really impact on
4 the role for the voluntary market.
5 And just to give a couple of examples,
6 there's a new initiative in the U.S. called the Climate
7 Vault, where voluntary markets are buying allowances
8 out of compliance markets because they are buying out
9 of a very strongly credible system with a real limit at
10 a statewide level. That's an option that could be
11 attractive for voluntary markets. They've done very
12 similar things for the last 10 years in New Zealand,
13 buying out of the compliance market to meet voluntary
14 market needs.
15 So that's a direction that could evolve
16 further. And what we may see is that as the compliance
17 markets really get established, the voluntary ones will
18 shrink because the corporate actors will be -- have
19 these very strong compliance options to use instead.
20 And that could conceivably happen very rapidly.
21 Also, the desire for standardization, which
22 is really critical, could invalidate many of the

1 current credits that are coming out on the market, not
2 the really strong ones, in the short term from people
3 like VCS and so on, who've been discussed earlier, but
4 from some other smaller suppliers who are springing up
5 very, very rapidly.
6 So, I think there will be a lot of risks if
7 we have the transition from voluntary to compliance
8 markets and from domestic to larger-scale markets.
9 This could lead some types of credit to lose all the
10 value, and it could lead prices to be driven by new
11 political forces.
12 A particularly critical issue we do need to
13 watch is the problem of integrating compliance and
14 voluntary markets because you can't count emission
15 reductions twice in a way that suggests that you are
16 creating climate benefit twice. You could use the same
17 reduction to meet a U.S. target and a company target,
18 but you can't claim that both of those are independent
19 reductions. They're happening in the same activity
20 from the same jurisdiction. And we still don't have
21 models to how those they're going to fit together as
22 more and more countries have really solid, nationally

1 determined contributions and commitments under Paris
2 that they began to comply with.
3 Last slide, please. So, in summary, cap-and-
4 trade markets are created by regulation. They're a
5 regulatory phenomenon. So, the politics behind those
6 creates price risk. The second, supporting clean
7 investment is a central goal. And that makes managing
8 that policy-driven risk really key. And if market
9 processes and initiatives like that can help with that
10 process, that would be very helpful. Third, equity and
11 avoidance of manipulation are possible and very
12 important, but they do require more attention than
13 we've given them in the past.
14 And finally, I think these markets are really
15 growing fast and prices are likely to rise. And also,
16 the shape of the market is evolving fast. So, this
17 will need to be an ongoing engagement to make sure that
18 the way that the derivatives markets are handled keeps
19 pace with those underlying changes. Thank you very
20 much.
21 CHAIR WIGGINS: Thank you, Suzi. Erik?
22 MR. HEINLE: Thank you, Dena. My name is

1 Erik Heinle. I'm with the Office of People's Council
2 for the District of Columbia. I want to start just by
3 thanking Commissioner Berkovitz, the Commission, Dena,
4 Abigail for including me in today's excellent
5 discussion and more importantly, making sure consumers
6 have seat at the table as these important issues are
7 addressed.
8 My office represents ratepayers in the
9 District of Columbia with a focus on retail ratepayers
10 such as individual residential consumers and small
11 businesses. Folks who otherwise would not have a seat
12 at the table in discussions regarding energy policy
13 either at the retail or wholesale level. In addition
14 to ensuring affordable rates and reliable service for
15 district ratepayers, my office is charged with
16 evaluating how certain energy policies impact the
17 District's ambitious climate and clean energy goal.
18 Thus, we consider market constructs like carbon
19 markets. It's with the goal of most cost-effectively
20 facilitating the energy transition to clean, carbon-
21 free, reliable electric service.
22 With that framework, I'd like to speak to you

1 about how our office, DCOPC, approaches carbon pricing,
2 while noting that many other consumer advocate offices,
3 the primary focus remains on ensuring the lowest
4 possible rates for their consumers regardless of
5 resource type.
6 Finally, the usual disclaimer that the
7 comments shared here for discussion purposes only and
8 don't necessarily reflect the policies or positions of
9 the People's Counsel on any specific issue.
10 If we could jump to slide three, that would
11 be great. Go back one please, actually. Great.
12 Appreciate it, thank you. So, the old sort of consumer
13 advocate adage used to be "reliability at the least
14 cost." And under that, "price is king as long as it
15 does not impact service reliability."
16 However, as states new jurisdictions, like
17 the District, enacted clean energy and decarbonization
18 goals aimed at limiting and mitigating the impacts of
19 climate change, it may be time to rethink this
20 perspective to cost-effective reliability and
21 sustainability.
22 Here, cost is so critical over resources with

1 attributes that help reach reliability and
2 sustainability targets have value outside the immediate
3 energy and capacity they generate.
4 Importantly -- and this is, I think, Suzi
5 Kerr did a great job of highlighting the environmental
6 justice concerns. But we must always be mindful of the
7 impact on low and moderate ratepayers of all these
8 policies. I mean, economically, diverse jurisdictions,
9 like the District, we have ratepayers desire and can
10 afford clean energy at almost any cost, and ratepayers
11 for whom any increase in cost would impact their
12 ability to afford life's other essentials, including
13 food, medicine, and shelter.
14 So, all of these factors must be weighed as
15 states and jurisdictions consider energy solutions that
16 are reliable, even during the hottest and coldest
17 months, that are resilient against extreme weather, and
18 cyber and physical security threats that consider
19 issues of immediate environment and environmental
20 justice, that address economic concerns and
21 opportunities that achieve decarbonization goals. And
22 of course, that ensure that rates are just and

1 reasonable.
2 Finally, I want to note that all the items I
3 just mentioned fall squarely within the state's
4 jurisdictional bailiwick under the cooperative
5 federalism framework created by the Federal Power Act
6 and the Natural Gas Act.
7 If you could advance the next slide, please.
8 As I mentioned, the District has robust decarbonization
9 goals, including reducing carbon emissions by 50
10 percent by 2032 and carbon neutrality by 2050. These
11 align with our goals and commitments under the Paris
12 Climate Agreement.
13 However, it's worth noting the District is
14 not alone, and other jurisdictions have enacted similar
15 goals. According to the National Conference of State
16 Legislatures, more than half of the states have
17 established renewable energy targets; 30 states, as
18 well as Washington, and 3 territories have adopted
19 renewable portfolio standards or RPSs. Fourteen
20 states, Washington, Puerto Rico, and the Virgin Islands
21 have an RPS requirement that exceeds 50 percent or
22 more.

1 As I said before, offices like mine are in
2 are charged really with the responsibility of making
3 sure that as low -- as state and jurisdiction -- and
4 other jurisdictions set the clean energy goals, we can
5 do so in a cost-effective, reliable way.
6 Advance to the next slide. Great. So, I
7 mentioned that many states have clean energy and
8 decarbonization requirements. They differ both in the
9 target number. So, for example, whether it's 50
10 percent, 35 percent, 40 percent, whatever the number
11 might be, as well as the pace. Some governments it's
12 2030, 2050, 2070. And it's also worth pointing out
13 that some states, as is their right, do not have any
14 clean energy or decarbonization requirements or goals.
15 Additionally, states may define clean or renewable
16 energy resources differently.
17 Almost all states that have RPS requirements
18 include additional resources like solar, wind, and
19 hydro. But several states include nuclear power, under
20 a zero-emissions resource credit -- and credit it
21 accordingly. Others include thermal generation that
22 uses renewable resources like ethanol, waste, or pulp.

1 And as carbon capture and sequestration technology
2 develops, thermal resources that have this capability
3 may also be included under the umbrella of clean or low
4 emissions resources.
5 This diversity, of course, can be a strength,
6 particularly as we consider the range of resources
7 necessary to reliably and sustainably meet the targets
8 of the energy transition. But it also complicates
9 policymaking at the regional and national level.
10 For example, PJM Interconnection, which
11 manages the wholesale grid for 13 states and the
12 District of Columbia, has a carbon pricing taskforce
13 that has been going for the past two years. While
14 discussions around stakeholders, including DCOPC, have
15 been informative and robust, issues like border
16 adjustments between the different states that make up
17 PJM and their different decarbonization goals makes
18 progress difficult.
19 And, you know, we talked a little bit earlier
20 today about the difficulty with border adjustments
21 internationally. But those same issues arise and are
22 just as politically thorny domestically when we have

1 different goals and different carbon and energy goals
2 among states.
3 That's not to say there haven't been
4 successful multistate programs -- and Secretary
5 Grumbles talked to us earlier today about RGGI. But
6 they are limited and often encompass states who have
7 very similar generation portfolios and climate targets.
8 If we could jump to the next slide, please.
9 The slide that we're looking at here is a -- is
10 courtesy of PJM's *2020 Maryland and District of*
11 *Columbia State Infrastructure Report*. And I think the
12 big takeaway from this slide is that, you know, the PJM
13 region has seen significant reductions in carbon over
14 the last 15 years, largely due to the transition from
15 coal to natural gas-based generation.
16 And I think one great thing we can say about
17 this is that the existing market constructs, the energy
18 market, the capacity market, which is the forward
19 energy market in PJM, do work. And they are helpful in
20 reducing carbon.
21 And I want to sort of provide some late-
22 breaking news. So yesterday PJM announced the results

1 of its latest capacity auction. And again, it showed a
2 continued decline in high-carbon resources like coal,
3 while with an increased use of zero or low-carbon
4 resources like solar, wind, and nuclear.
5 I think the question here is has as all the
6 low-hanging fruit from the coal to gas transition
7 already been harvested? You know, we started out at
8 about 1,300 pounds per megawatt hour, and now we're
9 down to just below 800 pounds per megawatt hour. But
10 there may still be some room for lower carbon emissions
11 simply due to the market retirements of the existing
12 inefficient high-carbon resources.
13 Second, so assuming that we can't get to deep
14 decarbonization with existing market constructs alone,
15 we need to consider whether decarbonization -- whether
16 the carbon pricing, I'm sorry, can help us do that.
17 And that's really the discussion that's important here
18 today, and whether decarbonization can help us get to
19 that next level -- whether carbon pricing can help us
20 get to that next level of deep decarbonization that the
21 science tells us is necessary to avoid most of severe
22 impacts of climate change.

1 If you jump to the next slide, please. And
2 actually, one more, and this is kind of some of the
3 points that we talked about with the last graph on the
4 PJM market. So, as we look at carbon pricing from a
5 consumer perspective, there are several positive
6 attributes that stand out. As we look to transition
7 the grid into a reliable and resilient manner, we have
8 to evaluate resources based on common factors. Common
9 factors help us recognize that each resource brings
10 strengths and weaknesses, and that no resource runs
11 24/7/365.
12 So, every resource has outages, every
13 resource has weaknesses, whether it's fuel supply,
14 whether it's the intermittency of other resources such
15 as with solar and wind, whether it's the impact of
16 extreme heat or extreme cold on the ability of a
17 thermal resource to light.
18 And so, we need to create a framework that
19 considers those, and carbon pricing can help us do
20 that. Carbon pricing can also help create a uniform
21 value for all resources, both carbon free and thermal.
22 And this, again, allows us to value these resources on

1 the attributes they can offer, including the attribute
2 of lower or zero-carbon emissions.
3 So again, it's a way to sort of levelize the
4 playing field, allow resources based on the attributes
5 they have, and allow the market to recognize those
6 attributes. And attributes that are important to
7 consumers, like reduced carbon or zero carbon that
8 contribute to sustainability, those attributes should
9 be included in cost to consumers, and consumers should
10 pay for them. But, again, we need to make sure that
11 that there's a levelized playing field for that.
12 Pricing across the region may address some of
13 the border adjustment issues that we've talked about.
14 Obviously, the bigger markets or more flexible markets
15 may address some of those border adjustment issues that
16 are often very thorny and prevent the development of
17 large-scale carbon markets.
18 Carbon markets may reduce the need for
19 individual state policies. You know, I described the
20 patchwork of state policies, and different states have
21 different policies. I can't say that if we develop a
22 national carbon market or even a regional carbon

1 markets that the states would give up their
2 authorities. But I think there will be less incentive
3 to develop some of those policies.
4 And I think that would have a benefit.
5 Because as we lower barriers to entry, we increase
6 competition with lower prices, that -- those are all
7 good things for consumers. So again, I think in that
8 respect, carbon pricing may help create a more open and
9 competitive market. And that's obviously something
10 that the end consumers favor.
11 It may also address perceived concerns
12 regarding state policies in organized markets. These
13 concerns particularly address ways that state policies
14 may incent certain resources, including low-carbon
15 resources, and become a particularly tough issue or
16 flashpoint in the capacity markets at PJM and ISO New
17 England. While DCOPC believes that, at most, the
18 impact of these state policies has been minimal, carbon
19 pricing across all resources is one tool to address
20 this political concern.
21 Let's jump to the next slide, please. And
22 so, a lot of strong attributes of carbon pricing -- but

1 I would want to say that consumers and key markets are
2 not quite ready to dive right in. Most importantly, of
3 course, the details matter. We want to demonstrate a
4 cost benefit to consumers. Higher costs, which carbon
5 pricing will likely involve, must come with clear
6 benefits to sustainability.
7 And, you know, again, when we look at all
8 these different market mechanisms as consumer
9 advocates, it's really important to understand what
10 we're incenting, and making sure that if consumers are
11 asked to pay additional money that they're getting the
12 good bang for their buck, and that we're getting the
13 right incentives that we want.
14 There are questions, of course, about
15 equitable and just distribution of revenue from carbon
16 pricing. It's critical that some of the revenue from
17 carbon pricing be used to help ease the burden of the
18 energy transition for those moderate- and low-income
19 ratepayers who are really at the most vulnerable end of
20 the scale that we need to be concerned about.
21 Questions about the appropriate scope of the
22 private market. So obviously, we talked a little bit

1 about RGGI. And RGGI is an interesting focus because,
2 of course, it covers three organized markets: PJM, New
3 York ISO, and New England's ISO. We also talked about
4 the California Air Resources Board, and that's more
5 focused on a single market.
6 But the question is, does carbon pricing work
7 across a smaller sort of organized market? Does it
8 work across an organized market, an RTO, to go in a
9 multimarket situation? So again, something like New
10 York ISO, ISO New England, and PJM. Or do we want to
11 go for a nationwide carbon market?
12 And there are strengths and weaknesses to
13 each approach. And bigger markets, of course, bring
14 economies of scale. And the benefits of broad market
15 participation and competition, which lowers prices, and
16 probably gets us our most diverse and robust grid.
17 However, diversity of resources is across states and
18 across regions. And the topology of the transmission
19 system may limit some of those efficiencies.
20 So again, different regions that use
21 different sets of resources, transmission systems are
22 different across the country and in different organized

1 markets. And so again, that may limit some of the
2 resources -- some of the efficiencies that we would get
3 from a large multi-region or even national market. So,
4 it's something to consider as we move forward with it.
5 We want to, of course, match the incentives
6 with goals. Markets work best when incentives are
7 clearly tied to goals. We want to incent the right
8 resources, dispatch the right time, in the right place,
9 for the right cost. And, again, getting those
10 incentives in writing is always critical. And when
11 you're asking ratepayers to pay more and to incent
12 certain activity, you want to make sure those
13 incentives work.
14 Questions about the forward-looking nature of
15 the market. Many energy products are forward looking.
16 So capacity, financial transmission rights. Does it
17 make sense for this market to also be forward looking?
18 What's sort of the appropriate timeframe -- what would
19 stand -- again, the right resources to do so in a cost-
20 effective manner.
21 So those are all considerations that the
22 consumer advocate perspective and my office

1 perspective, if a carbon pricing proposal came forward
2 for, say, the PJM region, which was the District is
3 part of, those are some of the questions that we would
4 ask in terms of whether this makes sense for ratepayers
5 in the District of Columbia.
6 Last but not least, last slide, please. We
7 want to recognize what can the Commission, the CFTC, do
8 to help us? You know, make sure that if we go down the
9 road of carbon pricing and a carbon market, we do so in
10 a cost-effective, efficient, and equitable manner. And
11 recognizing, of course, obviously, the CFTC would not
12 be the body that would set up the market. Because all
13 of these markets have derivatives, it will play an
14 important part in making sure that the market works for
15 market participants, and for ratepayers.
16 So, sort of recognition of use of carbon
17 pricing as a hedging tool. Commissioner Berkovitz this
18 morning noted the way that the Commission can -- the
19 role the Commission can play in incenting certain
20 products that will help with the energy transition.
21 That's certainly an incredibly important part of this.
22 Ensuring transparency and market liquidity.

1 Consumers always want to make sure that the market is
2 transparent, that we understand the transactions that
3 are going on. And then of course, that there's
4 liquidity, so that prevents the market from market
5 power abuses, those types of things.
6 And then finally -- and this is also
7 something that I was really glad to hear Commissioner
8 Berkovitz mention, market integrity and ensuring that
9 consumers are protected from market manipulation and
10 failure. And that's obviously a key regulatory
11 function of the Commission.
12 So, with that, I'm happy to conclude and look
13 forward to any questions. But again, you know, I think
14 carbon markets can certainly offer potential for
15 consumers, but we need to balance that potential with
16 the details as they develop. So, thank you very much,
17 and I appreciate the time.
18 CHAIR WIGGINS: Thank you, Erik. Mr.
19 Chairman, Commissioners, the Natural Gas Supply
20 Association is a trade association of natural gas
21 producers, marketers, and suppliers. "Markets matter"
22 has been our tagline for well over a decade. If we

1 were all there at the CFTC and I handed you my business
2 card, it would say clearly on there, "markets matter."
3 But for us, it really is more than a tagline.
4 It's really fundamental to what we believe, that
5 markets do matter. We also recognize that there is a
6 national -- really an international conversation going
7 on about the need to reach a lower carbon energy
8 future. And while markets may never be perfect, really
9 whatever perfect means in that context, we do
10 fundamentally believe that a market-based approach is
11 the best approach to reach the goal of a lower carbon
12 energy future.
13 We're very proud of the fact that two years
14 ago NGSA publicly announced the support for national
15 economy-wide price on carbon. And that made us the
16 first national gas trade association to take that
17 position.
18 As we said then, and as we continue to
19 believe, an effective, well-designed carbon price
20 policy, whether it takes the form of a tax, or a cap-
21 and-trade, or other forms of pricing, it's really
22 critical to decarbonizing the world's energy system.

1 Such an approach, we believe, would provide a level
2 playing field for different fuels and technologies.
3 We are not against any other fuel. We just
4 want an opportunity to compete. We know that it's
5 going to take a lot of hard work to build a lower
6 carbon energy future, and we know that nothing is easy
7 when it comes to tackling the issues around climate
8 policy. So why should this be any different?
9 The details -- and some of them have been
10 talked about here today -- about border adjustment,
11 leakage, the price of carbon, how to allocate the
12 revenues, those are just a few of the really many
13 complicated issues that agencies, states, regions,
14 governments are going to have to sort out. But in our
15 view, it's well worth the effort. And it's well worth
16 the effort to develop a sustainable, long-term solution
17 and also instill market confidence in the future.
18 But regardless of how it's done, our members
19 seeing natural gas as an important building block in
20 reaching important climate goals, a building block that
21 is in partnership with renewables. It's also abundant
22 here in the United States. And it's affordable, which

1 is also something that's been discussed quite a bit
2 today.
3 We've seen some success in the discussions of
4 carbon policy, particularly at FERC in an effort that
5 began under Chairman Chatterjee's leadership. FERC
6 recently issued a policy statement that makes it clear
7 that FERC will consider a carbon pricing proposal that
8 are brought to it from the organized markets from the
9 state, while confirming also that FERC does not intend
10 to step on states' rights.
11 Recognizing that there are lots of obstacles,
12 we still think that a carbon price policy is the best
13 and most sustainable long-term solution for several
14 following reasons. First, we believe that if it's
15 properly implemented, it will allow us to effectively
16 achieve carbon reductions without compromising
17 competitive wholesale markets. For instance, some
18 resources in the regional transmission organizations,
19 the RTOs, are subsidized by their state, which allows
20 them to bid lower prices in the market and outbid those
21 that are not subsidized.
22 Second, carbon prices allow all resources to

1 compete, and allow for natural gas renewable
2 partnership to address intermittency and resource
3 adequacy. Keeping the lights on is one goal that we
4 all share. And in some of the conversations that have
5 gone on in some of the states, in the cities, in the
6 localities, I'm not sure that keeping the lights on is
7 really something that has been fully considered the way
8 that we think it should. We've got to keep the lights
9 on. We've got to continue to power this country. And
10 that's a promise that I think we've all made and that
11 we need to keep to maintain the public's trust and
12 confidence.
13 Third, carbon pricing incents innovation.
14 Now, one of the reasons that we have such an abundant
15 supply of natural gas in this country right now is
16 because of the Shale Revolution. The Shale Revolution
17 came out of technological innovation. So those same
18 smart people and more smart people who have devoted so
19 much time, effort, and energy in the innovation that
20 led to this Shale Revolution I'm sure will continue to
21 work on things that can lead to new or cleaner
22 technologies. Carbon capture, utilization, and storage

1 is one. But all of these new technologies will
2 hopefully reduce the cost of carbon for businesses.
3 And finally, allowing the market to select
4 the most economical resources has never been more
5 important. We're hopefully coming out of a pandemic.
6 Hopefully, it won't be that much longer before we'll be
7 able to gather at the CFTC and other places to discuss
8 all of these important issues. But there's a recovery
9 in this country going on. People are trying to get
10 back to work. People are trying to get back to their
11 job. States, households, businesses are invested and
12 are investing in this economic recovery. And the
13 revenue generated by carbon pricing can be used to help
14 those who have been impacted.
15 We're not in favor of government policies
16 that pick and choose the resource mix through direct
17 funding. That's why we believe that markets matter and
18 that markets work. And as a key federal regulator of
19 markets, the CFTC is as well aware as we are that
20 markets do matter.
21 Given the broad support for carbon pricing,
22 and what we think is a general recognition that is one

1 solution that really can effectively balance between
2 climate carbon targets and selecting the lowest cost
3 resources, encouraging investment, and ensuring energy
4 reliability, sometimes we're a little puzzled as to why
5 it doesn't get more traction.
6 But we're really thankful that, today, this
7 conversation is happening at the CFTC. We think that
8 the CFTC is an important convening authority to
9 continue to bring market participants and stakeholders.
10 And really, everyone who has a stake in this and the
11 outcomes of this conversation. But to bring people
12 together and then continue to get ideas and thoughts
13 and proposals about how we can move this forward.
14 Thank you very much for your time. And with
15 that, I will turn this over to our next panelist,
16 Annette. Thank you.
17 MS. NAZARETH: Okay, thank you. And thank
18 you -- can you hear me? Thank you very much for
19 inviting me to speak today on the Taskforce on Scaling
20 Voluntary Carbon Markets. I very much appreciate the
21 invitation of the Commission and the market advisory
22 committee to have the opportunity to be here today.

1 The Taskforce, I know, has been mentioned
2 several times in the proceedings today, which is very
3 gratifying. It's also, I think, a dramatic fact that
4 we were a very open group. And many -- I think many of
5 the folks who are listening and participating today
6 have probably either participated or had input into our
7 process.
8 So, the Taskforce on Scaling Voluntary Carbon
9 Markets is a private sector-led initiative. It's
10 working to scale an effective and efficient voluntary
11 carbon market to help meet the goals of the Paris
12 Agreement. The Taskforce was initiated by Mark Carney,
13 who many of you know is the U.N. Special Envoy for
14 Climate Actions and Finance. And he also, if you
15 recall, was the former Governor of the Bank of England,
16 then former Governor of the Bank of Canada.
17 The group is chaired by Bill Winters, who is
18 Group Chief Executive of Standard Chartered. And it's
19 sponsored by the IIF, which under the leadership of Tim
20 Adams. And I am here today because I served as
21 operating lead for the Taskforce, I suspect, because of
22 my background at the Securities and Exchange Commission

1 with respect to markets as the Head of the Division of
2 Trading and Markets, and then as a Commissioner. And
3 our group also has a tremendous amount of knowledge and
4 advisory support from McKinsey.
5 So, the Taskforce, as I said, is a very broad
6 group, over 250 member institutions and over 400
7 individuals. And I can attest to the fact that they
8 have been very active participants, and they represent
9 really the whole value chain for the carbon markets.
10 They represent buyers and sellers with carbon credit,
11 standard setters of the financial sector, market
12 infrastructure providers, civil society, international
13 organizations, and even a number of academics.
14 We also, in the second phase of our efforts,
15 formed an advisory group of 20 environmental NGOs and
16 investor alliances and academics to run by them, you
17 know, what the results of our working groups were in
18 order to get their views and make sure that we were
19 aligned with current thinking.
20 The Taskforce's unique value proposition, as
21 I said, is that we brought together so many members of
22 the value chain to work together and to provide

1 recommendations on such a critical issue facing our
2 countries and the world. And that was really one of
3 the main focuses of ours, is that this is a global
4 issue, and we have to address it imminently.
5 As others have said today in order to achieve
6 the Paris ambition of limiting the average temperature
7 rise to 1.5 degrees Celsius, everyone in the global
8 community has to reach net-zero emissions by no later
9 than 2050. And to credibly reach that target, have to
10 start well before 2050, and we believe well before
11 2040.
12 So, you know, we have been advocating that
13 every participant in the economy, every country, every
14 bank, every investor, has got to start adjusting their
15 models now and developing credible plans for their
16 transition, and to implement them as rapidly as
17 possible.
18 Many countries and companies today are rising
19 to that challenge, but more needs to be done. We think
20 that in that order to -- in addition to addressing the
21 primary obligation that corporates have, for instance,
22 to decarbonize, additional compensation and

1 neutralization efforts are also very important. So
2 more has to be done.
3 And the reason it is important to have these
4 carbon markets is that it is impossible for some market
5 participants to reduce their carbon emissions as
6 quickly as necessary, given either the state of
7 technology or the excessive costs of doing so at this
8 point. Which is why having carbon offsets and having
9 carbon credits is an important supplement to that
10 effort.
11 Others talked, I thought very eloquently,
12 about the difficulties in the markets today. Derek,
13 among others, talks about the efforts of CME, I thought
14 it described it well. I mean, what we have today are
15 markets that I don't think that kind of robustness, the
16 integrity, the transparency, frankly, the
17 standardization that we think is necessary to build
18 these markets up quickly enough to make a real
19 difference in our carbon goals.
20 We need, as I said, more standardization. I
21 think what we have today -- we have carbon markets.
22 We've heard about them in today's call. And I think

1 there's been a lot of progress made. And those who've
2 been involved in that should be credited with that.
3 But the fact of the matter is, we still face
4 a lot of uncertainty in these markets. There's still
5 concerns about the integrity of the underlying carbon
6 credits. There are concerns, some raised concerns,
7 about the registry. I think with the lack of
8 standardization, pricing is difficult. And in
9 addition, I mean if you just think about market
10 structure in general, I mean if you build robust,
11 standardized markets, you would expect more liquidity
12 to aggregate around these products. And therefore,
13 liquidity would beget liquidity.
14 And going back to one of the questions I
15 think that Commissioner Berkovitz raised, I think you'd
16 also see more intermediaries coming into the market.
17 In other words, this is something that we want to
18 really scale up, like a very well-functioning,
19 legitimate, well-recognized market as quickly as
20 possible.
21 So, to give you a little background, the
22 Taskforce was initially convened in September of 2020.

1 And at that time, we came up with a report of 20
2 recommendations, identifying solutions that were
3 necessary to scale the voluntary carbon markets. And
4 those things that were discussed really went to market
5 integrity, product integrity.
6 Again, as I mentioned, coming up with a
7 standardized product is something that I'll talk about
8 later, which was a core carbon principles, what is the
9 core underlying and also additional attributes -- which
10 are additional attributes to the carbon contract that
11 are important to some people, whether it's the type of
12 -- whether it is a natural-based solution, or a
13 technology project, or things of that nature, so that
14 people could have a limited number of additional
15 attributes as well.
16 The membership -- the report was issued on
17 January 27 at the virtual World Economic Forum, among
18 other places. But since then, the membership has
19 grown. And as I said, we now have a huge number of
20 members, over 250 organizations, 20 sectors of the
21 economy represented, and membership over 6 continents.
22 And as I said, to ensure the highest level of

1 integrity, we also added an advisory board.
2 But the work isn't done. We recommenced the
3 project. Phase 2 began in March of this year. And
4 we've done a lot of work that I'd like to briefly
5 describe to you, and also commend to you our report,
6 because we have issued a draft report of this Phase 2.
7 It was issued on May 21st. They're looking for June
8 21st for folks to get back to us with comments.
9 But the work for the Phase 2 focused on three
10 primary core working groups or working topics. One was
11 governance. The second was legal principles and
12 contracts. And the third is credit level integrity.
13 And I'll describe those in a bit more detail.
14 Now, other areas that were also part of the
15 recommendations from Phase 1 are -- they're not
16 forgotten. But we are dividing and conquering. There
17 are other groups and other independent efforts that are
18 underway to address the issues that we did not
19 undertake.
20 [Audio interruption 4:33:28 until 4:33:54]
21 -- and have been done primarily by the
22 private sector. And I think many who are participating

1 today have been part of those efforts. And I know that
2 there are lots of efforts underway for how we're going
3 to clear these trades, what type of future products
4 might be created, focus on meta-registries and the
5 like. So, lots and lots of work underway there and
6 with some of the other issues.
7 But as I said, we focused on three primary
8 issues: governance, legal principles and contracts, and
9 credit level integrity. We also had a fourth working
10 group that was done primarily by the operating team,
11 and that was stakeholder engagement. That's one of the
12 very important issues here, is that there'll be the
13 common public understanding and narrative around the
14 value and objectives of what we're doing and the value
15 of an offset market. So, we spent lots of time on that
16 as well.
17 But for our three working groups, I'll focus
18 them on them in rapid order. Our first goal in
19 governance was to create a future umbrella body, with a
20 mandate to implement, host, and curate a set of core
21 carbon principles, provide oversight, standard setters,
22 and to coordinate interlinkages between individual

1 groupings. And so, the Taskforce did create a
2 blueprint for a future governance body, specifying this
3 mandate, organizational structure, potential sources of
4 funding, and a process for its setup.
5 We did find that a large majority of our
6 participants emphasized -- and I heard the sentiment on
7 today's proceedings as well, that we need to really
8 increase the quality of credit. We need to have -- to
9 ensure integrity and liquidity in these markets. And
10 so, the feeling was that to have trading at scale and
11 to ensure that that happens, we needed to propose an
12 oversight group.
13 Obviously, challenging to do that from
14 scratch. We've got several recommendations on how to
15 do it, that, again, we're looking for views on. But as
16 I said, the base issues with this group are that are
17 really have to establish, post, and curate the core
18 carbon principles, and what is the eligibility for
19 those.
20 This committee that we formed, this working
21 group, did not come up with what those standards were,
22 but rather is leaving it to the governance body to come

1 up -- to establish what those core principles are, and
2 then establish an assessment framework and assess --
3 and then establish eligibility principles for suppliers
4 and verifiers.
5 They also provide oversight for the standard
6 setting organizations on adherence to the core carbon
7 principles. I keep wanting to call them CCPs. But I
8 know everyone on this call, like me, thinks of CCP as
9 something other than core carbon principles. And then
10 they will also work on coordinating with other groups
11 that are involved in voluntary carbon markets to ensure
12 that there's consistency across those efforts.
13 The second working group, again, was legal
14 principles and contracts. And our goal there was to
15 standardize the legal framework underpinning credit
16 issuance and trading contracts with a common language,
17 common understanding, -- things like liability,
18 ownership, delivery, et cetera.
19 Again, one of the issues that we have today
20 with the carbon markets is a lack of taxonomy, a lack
21 of consistency of provisions. We have buyers and
22 sellers who find each other and do trades, but the lack

1 of standardization is certainly a friction in
2 preventing rapid scaling of these markets.
3 So, we defined use cases to drive awareness
4 of the potential ways to use the market. We developed
5 operational requirements or terms of use and standards.
6 And then we worked on developing general trading term
7 clauses. So again, it's something that governance
8 group can ultimately act upon. But we thought that it
9 would be helpful to give them a head start by coming up
10 with what would key terms be, such as rules on dispute
11 resolution, limitations on liability, indemnity clause,
12 things of that nature. So that, again, we would be
13 furthering the goal of having standardization and
14 consistency in the market.
15 Finally, the third working group is credit
16 level integrity. And our goal there was to create the
17 core carbon principles that I've described. And I
18 should be clear that while we describe what would be a
19 core carbon principle -- and therefore, what would be
20 eligible for the carbon trades that we're recommending
21 -- the bottom line is that there's nothing that
22 precludes trades from being done that don't meet those

1 standards -- they just -- obviously did not come within
2 our framework. We're not regulators who can prevent
3 trading in other ways.
4 So, we achieved our -- we think, our goals,
5 by drafting an assessment framework for the standards,
6 and an analysis of credit eligibility criteria, and a
7 proposed taxonomy for additional attributes. This one
8 is going to be the biggest amount of work for the
9 governance group because obviously, there's a lot that
10 goes into developing what are -- what is a core carbon
11 principle.
12 We've done -- you'll see in the report a lot
13 of work on -- all of the literature that so far expands
14 on what makes a good, credible carbon contract. And
15 that will be a starting point for the governance body's
16 work. But again, the core carbon principles at base is
17 designed to create a high-quality standard for carbon.
18 And as I mentioned earlier, we also have
19 proposed a limited number of additional attributes that
20 we think are likely to be of interest to buyers and
21 sellers, but that -- we think by limiting the number
22 again, it will hopefully encourage greater

1 standardization.
2 So, the additional attributes today, these
3 are attributes that exist today, I think some of our
4 panelists even discussed them, but they're not often
5 specified. And they're not -- if you look to the
6 registries today, they're not classified in the
7 registries as having these attributes.
8 So, for example, was the contract for removal
9 versus avoidance or reduction credit? Going forward,
10 these attributes would be specified for each contract.
11 Other types of things, as I mentioned earlier, such as
12 what was the removal or reduction method, such as was
13 its technology or nature-based, or what was the storage
14 method? Those are the kinds of things that we are
15 proposing as additional attributes. And we think,
16 again, having the core contracts and the additional
17 attributes will -- the limited number of additional
18 attributes would enhance the ability to create
19 reference contracts based on those actions.
20 So needless to say, we think this has been a
21 really historic effort. It's been very gratifying. It
22 has been tremendous to have the cooperation of so many

1 people who -- you're always saying, "Leave your special
2 interest at the door, and just given it your best
3 effort." And I really think, largely, that was the
4 case for very similarly minded -- very like-minded in
5 trying to do the right thing for the planet.
6 And so again, just to remind you, the report
7 was -- the draft report was made public. We are
8 looking for comments that anyone might have by June
9 21st. I think you could find the report on the IIF
10 website, among other places. We plan to issue our
11 final report mid-July. And from there, our hope is
12 that it does not become a very heavy doorstop, but
13 rather something that really makes a difference.
14 We're very optimistic that we'll be able to
15 stand up a governance group quickly as possible. Late
16 summer or early fall would be our goal. We also are
17 hoping that we would see some pilot trades done before
18 the end of the year. And we're also very heartened to
19 see all the activity, as I said, that is already
20 happening, particularly in the capital markets in this
21 area. I mean, we've seen some carbon exchanges already
22 being formed and being ready to -- announcing their

1 formation with -- IHS Markit announced that they've
2 created a meta-registry that could bring data together
3 from all the registries across the globe.
4 So, the wonderful thing about this -- these
5 kinds of efforts that you do get to see how the capital
6 markets can work at their best to come up with the
7 right structure.
8 And finally, I think, you know, as others
9 have said, it's quite clear that what we'll see from
10 all this is future contracts in this area. That's why
11 we're here today. And I know that the CFTC's been very
12 encouraging of efforts in this space. And I'm looking
13 forward to working with you over time to -- in the way
14 that you can to assist us in having a robust and
15 credible markets for carbon offsets.
16 CHAIR WIGGINS: Thank you, Annette. Matt,
17 we'll turn this over to you now.
18 MR. PICARDI: Thanks, Dena. Good afternoon,
19 Mr. Chairman, Commissioners, EEMAC participants.
20 First, I want to start out by thanking Commissioner
21 Berkovitz, and Abigail Knauff, Lucy Hynes for
22 developing this timely program, and giving the

1 Commercial Energy Working Group an opportunity today to
2 present on what -- our activity a little bit in these
3 markets. But more importantly, offer a proposal that
4 we think going forward will help the Commission
5 understand both the underlying markets and maybe the
6 way the secondary and derivative markets can develop
7 around what we call environmental products, which are -
8 - have a little bit broader scope maybe than just
9 carbon emission credits, because they're part of the
10 energy market complex.
11 But let me begin by congratulating all the
12 previous participants today and panelists, and their
13 extraordinary presentations. They were very
14 informative and really framed a lot of what's going on
15 today. Then I want to provide some background on our
16 proposal on -- or on what our proposal involves.
17 So, the members of the Working Group
18 participate in many different energy markets, and
19 markets that have government programs that are directed
20 at reducing carbon emissions. For example, we've heard
21 a lot of discussion today about transportation sector
22 efforts, utility sector efforts, voluntary markets,

1 programs that work -- are generated at a -- by
2 government agencies.
3 Overall, we support an economy-wide market-
4 based oriented approach to explicitly add the price of
5 carbon to energy markets as a means of reducing carbon
6 emissions. We believe this is the most efficient way
7 of reducing carbon in the sector.
8 At the federal level, we -- at least with
9 respect to the development of underlying markets, there
10 have been recent legislative proposals to address
11 carbon emissions that includes some market-oriented
12 approaches. It's hard to tell though where those
13 proposals will go, and it's still gaining traction.
14 So, at present, we kind of view the world in
15 a way we've heard a lot of today, which is around state
16 and regional programs in the US. They're conducted at
17 those levels and in different sectors of the economy,
18 and they're directed to reduce carbon emissions. But
19 more importantly, like we heard today, they're also
20 designed to support the development of renewable
21 resources that will help the overall reduction of
22 carbon emissions in our economy.

1 Members of the Working Group face compliance
2 obligations with a lot of these programs. For example,
3 we could look at RGGI and members who would be
4 operating fossil fuel-based carbon electric generation
5 plants that emit carbon, and have to participate in
6 those markets and do so in order to meet compliance
7 obligations. And they also participate in renewable
8 energy credit markets under renewable portfolio
9 standard programs that we see across the different
10 states. And those programs are more directed at
11 developing specific renewable resources.
12 And we can discuss whether or not those
13 programs are within scope or without a scope of what
14 I'm talking about today, but they're certainly related.
15 Because they -- as we look at those programs and
16 there's -- and renewable energy credit markets that
17 evolve around them, we know that they are a part of the
18 revenue stream in the support that's needed to develop
19 a lot of these resources we want to do going forward.
20 So, we really believe that the near future,
21 at least, will include a smorgasbord of policies, as we
22 call it, and environmental products that will be used

1 to address carbon emission reductions. And since the
2 physical markets and derivative markets for these
3 products are closely related, we think it's important
4 for the CFTC to have a background on these, how they
5 developed in the parameters of these products.
6 As I mentioned, it's well established that
7 the carbon markets and the markets for allowances
8 simulated derivatives are closely linked. And
9 financial derivatives play an important role or
10 function in enhancing liquidity and facilitating price
11 discovery, help market participants hedge and meet
12 their compliance obligations, as well as consider the
13 way they want to develop particular resources.
14 This linkage means it's important for the
15 CFTC to provide guidance on principles that it would
16 consider in each role as regulator of certain secondary
17 markets and derivative markets for environmental
18 products. And again, when I talk about environmental
19 products a little bit broader, not just including some
20 of the markets we talked about, directly dealing with
21 carbon emissions, but also maybe renewable energy
22 credit markets.

1 By having this understanding and a strong
2 regulatory insight and oversight of these markets, we
3 will lend competence to market participants and
4 policymakers considering developing new environmental
5 products going forward. And it will also help market
6 participants comply and hedge their obligations going
7 forward in support of efficient, market-based
8 solutions.
9 The Working Group is proposing the
10 establishment of a subcommittee charged with the
11 assignment of preparing a report for setting forth
12 guiding principles for the design of markets, for the
13 independent trading of carbon allowances and offsets,
14 basically focusing on secondary markets and derivative
15 markets.
16 This effort would complement work that has
17 been done under the Market Risk Advisory Committee, as
18 well as what's going on in the newly created climate
19 risk unit. Also, it's worth noting that some of this
20 effort is probably not plowing new ground. And that is
21 because in 2011, an interagency report was developed
22 under the leadership of then Chairman Gensler looking

1 at the oversight of proposed carbon markets.
2 This report that was developed on an
3 interagency basis was required under Dodd-Frank when
4 that was implemented. And it provided analysis of the
5 then current and complex web of regulatory oversight of
6 carbon markets in the markets that existed at the time.
7 The scope and intent of the proposed -- what
8 we're proposing today in developing a subcommittee to
9 develop a report that would have guiding principles
10 around how these markets should function. It would be
11 different from those efforts that have taken place in
12 the past. It's intended to facilitate fair and orderly
13 trading in carbon markets by promoting uniform and
14 consistency between designing the secondary cash and
15 related derivative markets for carbon allowances and
16 offsets.
17 It is not intended to replace efforts that
18 other regulators will undertake and that have
19 jurisdiction over the development of the primary
20 markets for these products. And much of the discussion
21 we heard today has focused on the development of some
22 of these markets, what we call the primary or

1 underlying markets.
2 So, at a high level, we see kind of two
3 tracks here. One, there would be structural elements
4 that we would discuss with this committee and develop
5 guideposts around that would address things like a
6 clear statement of jurisdiction, identification of
7 policy objectives, the recognized need to facilitate
8 continued market development and liquidity, and
9 benchmark settings.
10 Some of the key market design features would
11 also be developed in this report, and some of those
12 items were touched on today. For example, we talked
13 about market integrity and customer protection. That
14 would be an element we'd like to see seen, cross border
15 considerations in transaction monitoring, to name a few
16 of a long list of developments that we think would be
17 part or it should be considered as part of a carbon
18 market design.
19 How do we intend to deliver this? Well,
20 we're proposing that -- we've developed a proposed
21 statement of purpose, which we hope that would be
22 considered by the committee in addressing some of the

1 items I just went over in more detail, and that that
2 statement of purpose would be considered by the
3 committee pursuant to whatever procedures that the
4 Commissioners and Abigail seem -- would say are
5 appropriate for considering this type of thing.
6 So again, we're trying to push forward here a
7 -- an approach that would help the development of these
8 markets. And we look forward to working with others to
9 do that. And thank you for your attention. And I'm
10 free to answer any questions about the proposal, if
11 anybody has any.
12 CHAIR WIGGINS: Thank you very much, Matt.
13 Abigail, do we have any questions and comments from
14 Associate Members at this time?
15 MS. KNAUFF: I have not seen any in the chat.
16 But if any Associate Members have a question, please
17 speak up.
18 CHAIR WIGGINS: If not, I will move to the
19 EEMAC Members. Do any Members of the EEMAC have a
20 question or comment?
21 MR. COTA: This is Sean Cota. Sorry for not
22 unmuting quickly enough. I guess my -- I just have a

1 general comment on everything. The potential for
2 leakages in these markets, as we're talking about
3 commodities that are global, right? Air is everywhere.
4 So, these things are going to go everywhere.
5 And the diligence that's going to be required in all of
6 these programs is going to be severe. So as these
7 markets increase in size, the challenge for the CFTC
8 and other regulators are going to be challenging. And
9 God bless you guys for working as hard as you are on
10 all of this. It will be a huge challenge. Thank you
11 for putting this together.
12 CHAIR WIGGINS: Thank you, Sean. Are there
13 any other questions or comments? I'll try the
14 Associate Members again, before we move back to the
15 Members. I don't think so.
16 Any questions or comments from the EEMAC
17 Members?
18 MS. KNAUFF: Yes, Bill McCoy.
19 CHAIR WIGGINS: Bill, go ahead, please.
20 MR. McCOY: Yeah, thank you. And I'd like to
21 thank all the Commissioners and all the panelists today
22 for their excellent presentations.

1 And, Matt, I think your proposal is very
2 intriguing. And you did mention cross border
3 considerations, like I was wondering whether you would
4 envision that the scope of this proposal or this report
5 would have potentially recommendations regarding the --
6 how the CFTC, which has had such a vast, great history
7 in terms of coordinating internationally with other
8 regulatory bodies.
9 How, given that this is truly a global
10 product, how it can be engaged in a further
11 coordination as these markets are developing and have -
12 - coming up with standards and policies, the approach,
13 so that there's perhaps a greater chance of liquidity
14 across the markets globally? Thanks.
15 MR. PICARDI: I think that -- as I take
16 Bill's question, as how that could maybe -- effort
17 could occur under the proposal I outlined and certainly
18 it -- the CFTC probably has more experience than any
19 agency I can think of -- or certainly tremendous
20 experience in addressing cross-border type issues. And
21 the participants on this committee and the
22 presentations we've heard from the various folks also

1 had a tremendous experience in that area.
2 So, I think it would be a great opportunity
3 to this committee that -- subcommittee, excuse me, that
4 we're proposing in our reports to be developed to focus
5 on how to do that because it is a worldwide problem,
6 and then in terms of how these markets are formulated
7 and how they could intersect would be a great effort.
8 DR. SANDOR: Dena, it's Richard Sandor. I
9 wondered if I could just make a shout-out to Annette
10 and Mark Carney who gave a presentation at the American
11 Financial Exchange at the University of Chicago on the
12 Taskforce for Scaling Voluntary [Markets]. Annette,
13 you would have been really pleased. He was fantastic.
14 Great academics joining from France, from England, from
15 the University of Chicago. And he spurred a tremendous
16 interest in regional and midsize and community banks.
17 So, let's keep in mind that there's 11
18 trillion in assets held by people outside the money
19 center banks, and there is the grassroots interest.
20 And for the CFTC, particularly for Don and other
21 people, but these folks like Zions Bank, bank farmers.
22 And there's really a big interest in agricultural

1 offset or as they are known at the University of
2 Chicago, negative emissions. I prefer that than
3 offsets.
4 Just a shout-out to Dan Berkovitz who
5 intellectually gets the whole history. And thank you
6 so much for organizing this. What a fantastic day, and
7 to all of the other Commissioners for supporting. But
8 just a great event, a real privilege to listen to all
9 of these experts.
10 MS. KNAUFF: We don't have any other comments
11 from the Members. Dena, I can't hear you. Do we have
12 any other questions from the Commissioners?
13 CHAIR WIGGINS: Are there any Commissioners -
14 - Commission Berkovitz?
15 COMMISSIONER BERKOVITZ: Yes, I was -- I'd
16 like to hear Annette's comment. Annette, you commented
17 on barriers to liquidity and issues. And in light of
18 the discussion about -- we should work together on many
19 of these same issues in the context of Dodd-Frank and,
20 as Bill McCoy mentioned, reducing barriers to
21 globalization and harmonization.
22 And harmonization was a key objective of the

1 Congress in the Dodd-Frank Act international
2 harmonization when the G20 met. And there was some
3 basic common standards that the G20 all agreed on that
4 that market should have, and we have comparability.
5 And there's a number of mechanisms that are
6 built into, for example, the Dodd-Frank regime to
7 promote global liquidity and harmonization. And the
8 climate, it's a very different political structure that
9 we're dealing with that there's not -- there's not
10 quite the same global commitment to all proceed along
11 the same lines and harmonization. And so, we do have
12 these regional markets and what -- in the Dodd-Frank
13 context would be considered fragmentation.
14 And I take it that part of what your effort
15 is -- is to maybe develop some common standards to
16 maybe help reduce that. But to what extent do you see
17 the regionalization and the separate markets as a -- is
18 this a barrier that can be surmounted, or is this just
19 something -- a type of fragmentation? Is it going to
20 result in separate liquidity pools of necessity? So
21 maybe you could -- or and any other panelists too. But
22 I think, Annette, you were --

1 MS. NAZARETH: It's a very good question.
2 Look, I think the issue is that here, visualization is
3 even more problematic, in a sense, right, because we
4 are looking for -- to basically have carbon contracts
5 based on projects in the Global South that folks in the
6 U.S. could invest in.
7 I mean, there's going to be a lot of -- I
8 think, a lot of cross-border transactions. And
9 therefore, I think the issues of cross-border are even
10 greater here, I would think. And of course, our
11 challenges that we don’t, in a sense, have the power of
12 the pen, right? We're not regulators, so we just have
13 to create a marketplace that people really see is of
14 value and want to participate in, and want to meet
15 those international -- those standards that we're
16 apparently -- you know, we're setting on this voluntary
17 basis.
18 But I think it will affect the pricing. I
19 mean, hopefully they -- you know, the more integrity
20 you have in the market, the better the pricing in the
21 market, the more people will want to work hopefully go
22 with them, you know, with us or deal with markets that

1 are adhering to our standards.
2 CHAIR WIGGINS: Evan, do you have a comment?
3 MR. ARD: Yeah, thank you, if I may. You
4 know, obviously, the regionalization of the markets now
5 is based on differentiated approaches to climate
6 issues, whether it be carbon emissions directly or
7 development of renewable energy. And so, you have
8 different regions that are approaching this in a
9 different way, different nations that are approaching
10 this in a different way. Although, they're all
11 driving, you know, ultimately towards the same goal,
12 ultimately, of, you know, decarbonization economy.
13 The market has -- I'll say, you know, the
14 market has dealt really well with this regionalization
15 and these differentiated market -- and these different
16 liquidity pools by creating structures that can trade
17 off basis, and other mechanisms like that. And the
18 exchanges have been really active in terms of listing
19 things across platforms that -- you know, in your
20 multiple markets, and allowing the players to almost
21 consolidate the liquidity themselves by the venue in
22 which they trade. So, I just wanted to add that point.

1 Thank you.
2 COMMISSIONER BERKOVITZ: Great all. Thank you.
3 CHAIR WIGGINS: Anything else from our
4 Commissioners?
5 If not, we'll move to the next panel, which
6 is our fourth and final panel of the day. We are going
7 to hear a CFTC staff presentation on the derivatives
8 markets' response to the extreme weather event in Texas
9 this past February. We will hear from Rahul Varma,
10 Associate Director in the Market Intelligence Branch of
11 the Division of Market Oversight; and Bill Heitner, an
12 Associate Director in the Risk Surveillance Branch of
13 the Division of Clearing and Risk. Rahul?
14 MR. VARMA: Yes.
15 COMMISSIONER BERKOVITZ: Excuse me, Rahul.
16 Excuse me, Dena. Before we proceed to the final panel,
17 I just wanted to clarify -- procedurally maybe,
18 Abigail, could you tell us procedurally where we are?
19 Matt Picardi had a proposal for further action, and
20 what -- procedurally, where do we stand on that? And
21 what would be the next step in Matt's proposal?
22 MS. KNAUFF: Sure. So, we are going to get

1 with -- we'll get a transcript at the end of this
2 meeting. And then we will circulate the transcript to
3 all of the EEMAC membership. We'll then schedule our
4 next meeting, where we will hold a vote, and take a
5 vote from the Members, because the EEMAC Members, the
6 nine EEMAC Members, have voting privileges, per the
7 EEMAC charter.
8 If the vote is to approve the recommendation
9 to the Commission that the Commission form a
10 subcommittee for the EEMAC, we will then file with
11 paperwork with the Commission, as well as solicit
12 requests for membership on that subcommittee, from the
13 EEMAC Members, EEMAC membership, EEMAC Associate
14 Members. And if there's any space available, we will
15 source it from the public-at-large for potential
16 subcommittee members.
17 And then once the [sub]committee is formed,
18 then the [sub]committee could begin its work in
19 creating a report.
20 COMMISSIONR BERKOVITZ: And from the time of
21 the transcript to the formal consideration, and about -
22 - the members could discuss amongst themselves, either

1 informally or in another meeting, in term -- in terms
2 of fashioning the proposal so that everybody can -- you
3 know, so that it's what -- the committee can kind of
4 achieve consensus on it.
5 So, there'll be that opportunity, correct,
6 for members to speak amongst themselves and review it.
7 MS. KNAUFF: They're not to have the
8 membership discuss across the membership but those
9 members can take the information from the transcript
10 back to their respective firms for review.
11 COMMISSIONR BERKOVITZ: Right, okay. Okay.
12 And then the Commission -- the Commission eventually,
13 would that -- it's mentioned, it's in the Federal
14 Register, and the Commission eventually would have to
15 approve it. Correct?
16 MS. KNAUFF: Correct.
17 COMMISSIONR BERKOVITZ: Yeah. Okay. Thank
18 you, Abigail. Sorry. Sorry, for the clarification
19 there. So, go ahead, Rahul.
20 MR. VARMA: Thank you. Thank you, Dena.
21 Thank you Abigail and Commissioner Berkovitz for this
22 opportunity. As we said in the introduction, as Dena

1 said, my name is Rahul Varma, I'm an Associate Director
2 with the Division of Market Oversight.
3 And today, we -- myself and Bill Heitner,
4 Associate Director in the Division of Clearing and Risk
5 will provide an overview of what happened in February
6 in the Southwest, and the big storm, Storm Uri, and how
7 it affected the energy markets, natural gas and
8 electricity in particular, and what effect it had on
9 the futures market.
10 I will provide an overview of the events and
11 the physical side of things. And Bill will wrap it up
12 to discuss the specifics on how it affected the CFTC
13 markets and what actions we took.
14 Next slide, please. Just to be clear, the
15 views that we express here are views of CFTC staff and
16 do not necessarily represent the views of the CFTC, the
17 Chairman, or the Commissioners, or the Division of
18 Market Oversight, or the Division of Clearing and Risk.
19 And consistent with Section 8, our
20 presentation is a high-level presentation on overall
21 market developments and market issues. We will not be
22 discussing anything specific about an individual trader

1 or a trading behavior by any specific group of traders
2 even.
3 Next slide, please. So, while the focus of
4 today's discussion is on the storm and the effects on
5 the energy market, today we want to start off by
6 acknowledging that this was a huge storm, and that
7 effect had a significant impact on life and property.
8 More than 100 people are reported to have
9 lost their lives during the storm. And the total
10 damages, the insured damages are estimated at around
11 $30 billion. But I've seen some estimates that total
12 losses are as high as $295 billion. This is a
13 significant impact.
14 So, what happened? So basically, for about a
15 week, between 13th -- or the 12th or 13th of February
16 to the 19th, the U.S., especially the Southwest -- and
17 by that I mean Texas, Oklahoma, Louisiana, New Mexico,
18 and Arkansas -- experienced severe weather, extreme
19 cold. And that's what we see in the map where we are
20 comparing the temperatures over this one week for the
21 five-year average.
22 And we can see that in a large part of Texas,

1 temperatures, for example, with 30 degrees below the
2 five-year average. It's quite significant. The other
3 thing that set this storm apart was the geographical
4 extent. It was -- it covered a large area. And at one
5 point of time or the other, there were 170 million
6 Americans who were under some sort of a weather alert.
7 And at its peak, 73 percent of the lower 48 were
8 blanketed in snow. And all of these factors play into
9 the effect that it has on the market.
10 Next slide, please. Okay. So, I'm going to
11 start off by discussing what happened in the natural
12 gas market to begin with. And if you go to the next
13 slide, so we have extreme cold weather. What this
14 means is there's a sharp increase in demand. And as we
15 see on the charts -- and this demand increased both for
16 heating as well as for electricity generation.
17 As we see in these charts, we're looking at
18 the Southwest. There's a -- comparing 2021 in the red
19 bars with the -- with the demand level for 2020 in the
20 blue bars, and you see over this period a very sharp
21 increase. And we can see -- and overall for this week,
22 demand was up by more than 50 percent in the Southwest

1 region. And this, in fact, pushed up the demand for
2 the lower 48, totaling by about 24 percent overall.
3 This is pretty significant for a one-week period.
4 I don't have it on this chart, but one of the
5 things that we observed is that as soon as the storm
6 passed, the demand level just fell down back to the,
7 quote-unquote, "normal level."
8 The other thing to note is -- that affected
9 the markets was that at the same time that demand was
10 going up, there was significant well freeze-offs in the
11 Permian region and natural gas production fell. That
12 is shown on the chart on the right-hand side when,
13 again, we compare 2021 with 2020.
14 A few observations here. At its peak, the
15 system lost about 22 BCF a day. That's roughly 24, 25
16 percent of the national production. The second thing
17 is that it wasn't an immediate effect on supply. So,
18 the rolling effect as more and more wells froze off.
19 And finally, we observed in the production side as well
20 that once the storm passed, production levels recovered
21 quite quickly back to the normal level.
22 So now we have a situation where we have high

1 demand and low supply. Now, how do we meet the
2 difference? Well, the difference was met from storage
3 withdrawals. And there was more than 300 BCF of
4 storage withdrawal for that one week. This is the
5 second highest level ever reported by EIA, and only the
6 second time ever again that it was more than 300 BCF
7 for any one week.
8 Let's more onto the next slide. So now we
9 have high demand, low supply, storage is being used
10 almost to the maximum. And what do we see? We see
11 high prices. Well, logically, this makes sense. And
12 directionally, we -- you know, it's consistent with
13 what we're seeing in the real marketplace that prices
14 would go up. We're not making any comments on actual
15 levels of the prices.
16 So, what we have on the map here is the
17 different parts of the country, different trading
18 points. We show the average price for that one week
19 and as well as the peak price -- the highest traded
20 price in the market.
21 I'm going to make a few observations here.
22 Before the -- before the storm, prices were averaging

1 around $3 an MMBTU. So, any prices that you see over
2 here, think about $3 as a starting point. The second
3 thing, because of the nature of the storm and the size
4 of the storm, you can see that there was a huge impact
5 all over the all over the country.
6 Second, these are prices for spot gas, for
7 daily gas, for next-day gas. Because this was a short-
8 lived, immediate event, this affected the short-term
9 prices. And as we'll see, not the long-term prices so
10 much.
11 So, what were the prices? I'll give you a
12 couple of points here. The Houston Ship Channel,
13 again, going from -- starting from around $3, it goes
14 up to $200, nearly $200 on average for the week, and a
15 peak transaction of $400.
16 If you look at Oklahoma, the average was $463
17 for spot gas, next-day gas, and more than $1,000 for
18 the peak transaction that were recorded. In fact,
19 these are the highest prices reported for -- record
20 prices for next-day spot gas, and trading platforms had
21 to accommodate and make changes in the system to allow
22 for four digits. So, this was a pretty spectacular

1 event when you look at the impact on the prices.
2 But turn your attention a little bit to the
3 Henry Hub note, which, you know, as you all know, is a
4 central point against which the future is delivered, et
5 cetera. And what we see over there is that average
6 prices reached $10. Again, quite significant, if you
7 think about it, that started at $3. But not nearly to
8 the level -- further away in the system. And the peak
9 transaction was at $24.
10 So, the fact that Henry Hub goes up, but not
11 by the same extent as other places further away, what
12 this tells us is that despite the supplies on screen,
13 the pipeline capacity was running all out. So, the
14 pipelines were running full, and so we would see
15 further, bigger impacts elsewhere in the system,
16 further away from the main production centers, if you
17 will.
18 Finally, we look at the natural gas futures
19 also, which is shown on the right-hand side, for the
20 same time period. In fact, a few days before the
21 highlighted area is the period of the storm. And what
22 we see here is that prices, again, going from around

1 $3, they jump up to about 3.22 at the peak, and then
2 they fall back down. Now this is about 15 percent.
3 The reason the future's prices did not show
4 the same impact was that these were futures for March
5 delivery. The delivery period did not come for another
6 two weeks.
7 Let's put all of these together. And, again,
8 what this tells us is that the market was looking at
9 this as a short-lived event. Now, another factor to
10 keep in mind is that March is considered the
11 traditional end of the winter season. So, there was a
12 low probability at this point for further supply --
13 demand shocks to the system. So, the futures really
14 did not have as much of an impact, did not see as much
15 of an impact as the cash market did.
16 Next slide, please. So now I'm going to turn
17 my attention to the electricity market, with a
18 particular focus on Texas. Next slide again, please.
19 Thank you. So, let's get a few basic facts about the
20 Texas market out of the way. The Texas electricity
21 grid is relatively, physically isolated from the rest
22 of the United States. Not completely isolated, but

1 relatively speaking it is. The grid is operated by
2 Electricity Reliability Council of Texas, or ERCOT, and
3 it is regulated by Public Utility Commission of Texas,
4 which is a state regulator, if you will.
5 The second thing that comes into play here,
6 and you'll see some effects of this, it's an energy-
7 only market. There really isn't a capacity market like
8 we've seen other ISOs and RTOs. And approximately half
9 of the generation in Texas is from natural gas.
10 So, during this period of the storm, we had a
11 significant level of equipment failure due to
12 inadequate weatherization, which means parts of the
13 system, whether it be a wind plant, a nuclear plant,
14 many different types of generation, they stopped
15 working because some part of the system froze up.
16 In fact, just a quick comment on that.
17 Recently, Governor Abbott signed one of -- a piece of
18 legislation requiring generators and some pipeline
19 operations to -- operators to improve the
20 weatherization of their system.
21 So as a result of this, so you have a high
22 potential demand, and we have supply falling off

1 because of weatherization. The second thing that then
2 happens is that ERCOT, as a system operator,
3 implemented load shedding to prevent system collapse.
4 And really, the way that, you know, we can think about
5 it is this, that the supply margins -- the reserve
6 margins that are left in the system, the cushion that
7 you have between the actual demand and what the system
8 can generate will -- when it begins to fall very low,
9 the system operator gets concerned that any small spike
10 in the demand levels can literally make the entire
11 system collapse.
12 To prevent that, they engaged in load
13 shedding. You've seen reports that said that ERCOT
14 came from within five minutes of complete system
15 shutdown. Essentially, that could have meant blackout
16 over much of Texas. As a result of all of this, there
17 were periods of time when the net-generation, the
18 actual generation of electricity, was just about 50
19 percent of the installed capacity or the generation
20 capacity that was available during the peak of the
21 storm.
22 All of this is shown in the -- in the chart

1 on the right-hand side. But I'll focus on two lines
2 for now, and the dark red line that shows what the
3 projected demand was. That's the demand forecast,
4 short while, you know, just before the storm. This is
5 what the profile -- they were planning -- they were
6 forecasting the demand would be.
7 And if you look at the thin, blue line, that
8 is the generation capacity that's available, so one
9 could get comfortable that, yes, if the generation
10 works, they would have been able to meet the demand.
11 However, because of the weatherization issues
12 and system failures across the state, what was actually
13 generated is shown in the dark blue line. And that's a
14 significant gap from the actual demand forecast. And
15 that's what leads to all of the issues related to load
16 shedding, et cetera, and, you know, all of the issues
17 that we saw in Texas.
18 Next page, please. Next slide. Okay. So
19 again, the same thing that we see in the natural gas
20 and electricity markets also. I'm showing two charts
21 here. One is for ERCOT, not real-time prices. And the
22 other is for the Southwest Power Pool, South -- let's

1 call it Oklahoma, Southern Oklahoma and parts of the
2 Texas Panhandle real-time prices.
3 So, you have high demand, supply shortfall,
4 high prices of natural gas. Put all of these together,
5 it's not surprising, it is to be expected that prices
6 will go up. And that's exactly what we see.
7 There's a subtlety that I ought to mention
8 here. Looking at demand makes sense for parts of the
9 system in, for example, in SPP. Looking at actual
10 demand in ERCOT may not be the most meaningful measure
11 because there was a supply shortfall where actual
12 demands can only be, essentially speaking, the same as
13 what was generated.
14 So, they -- you have to think about potential
15 demand -- or, in fact, more precisely, you have to
16 think about in terms of reserve capacity, what is
17 available, extra available to be regenerated.
18 So regardless, what we see is that in both
19 the systems, the prices jump up very high. These
20 charts are on the same scale. And we can see that in
21 ERCOT prices jumped up to about $9,000 a megawatt hour.
22 For reference, let's think in terms of $5,

1 $10 immediately before and after the storm. They jump
2 up from levels of a few dollars all the way up to
3 9,000. This happened several times. They touched in
4 February the 13th, again on the 15th. And then almost
5 steadily from the 16th through the 19th, they stayed at
6 $9,000 in ERCOT.
7 In Oklahoma - sorry, I should say, more
8 precisely, in SSP south hub, we see prices increase as
9 well. They increased up to again starting from a few
10 dollars all the way up to about 5,000 briefly, and then
11 they came back down, touched 3,000, and they came down
12 again then.
13 The difference between 9,000 and 5,000. And,
14 of course, there are local differences in the demand
15 and the generation and the price of natural gas, et
16 cetera. But another factor to consider is that for
17 ERCOT, it's an energy-only market, as we discussed.
18 And these high prices are meant to compensate
19 generators for both their -- for recovering the
20 variable costs as well as the fixed costs.
21 So, one of the things that we should -- I
22 would mention right at this point is that in ERCOT

1 there were some retail customers, who have retail power
2 contracts that are linked to the wholesale prices; not
3 many, but quite a few of them. And that fact also
4 becomes relevant as we think about -- as we look at
5 what happens afterwards.
6 So first, in the next slide, let's take a
7 look at how these markets intersect with the futures
8 market. So first of all, there is a very active market
9 in ERCOT futures. It's about daily contracts and
10 monthly contracts.
11 We're going to pay particular attention to
12 the daily contracts. And so, these daily contracts,
13 they trade up to the physical depth. So, for example,
14 I'm just picking a data out here, for the -- on the
15 15th of February, I could have traded contracts that
16 settled against the February 15th prices. These
17 prices, these futures contracts are all cash settled to
18 ERCOT prices. So, there is a direct one-to-one
19 correlation with -- whatever price ERCOT puts, that's
20 the price to which the futures settle.
21 And these -- and as I said, because of the
22 nature of the contract, there’s day of contracts, it's

1 a one-to-one correlation between what happens, a dollar
2 for dollar. And what we see over here is -- in the
3 daily contract leading up to the period of the storm.
4 But not during the storm, but leading up to the period
5 of storm, we see a sharp increase in both trading
6 volumes and open interest. This is on the left-hand
7 panel where the red line shows the open interest, and
8 the blue bars show the trading volume. And roughly
9 speaking, both of these about tripled.
10 And then we dissect this further, what we see
11 is traders taking position over the period of time
12 during which the storm was anticipated. So, for
13 example -- and this is just -- you know, I'm just
14 giving as an example to simplify our discussion here.
15 Somebody could be trading on the 10th of February,
16 which is a few days before the storm, and taking
17 positions for the 15th of February or the 16th of
18 February, which was expected to be right in the middle
19 of the storm.
20 So, if you think about it, what the futures
21 markets in the -- in the daily futures markets were
22 doing as exactly how any other futures markets would

1 work in terms of, you know, people have certain
2 expectations, and they expect those expectations in the
3 market. Normally, however, we think in terms of
4 futures being a month away, two months, three months,
5 whatever, away, here we're talking about a few days.
6 But it's exactly the same construct.
7 So, in that sense, these futures markets
8 provided the same service, and they continue to provide
9 the service for which futures markets are designed.
10 Just very quickly, I want to mention, if you look at
11 the bar on the right-hand side, the commercial -- the
12 futures markets' open interest is dominated by
13 commercials, 90 percent on the long side, and 80-plus
14 percent on the short side are traders who identify as
15 commercial in our systems.
16 Excuse me. Next slide, please. So now we
17 come to the crux of the matter in terms of price
18 adjustments, repricing. We've all heard about that,
19 the discussions, the debates, the newsprints about
20 repricing and how that might have affected the futures.
21 So, by this time, we've established that there is a
22 direct one-to-one correlation between our daily market,

1 in particular, and the prices. So, we were paying keen
2 attention to what was going on in this time period.
3 So, the chart on the right-hand side are the
4 same charts we've seen before for ERCOT, with the
5 prices going up and down, as we discussed, and the
6 highlighted areas of the period of interest to us from
7 a repricing perspective. So, the first blue bar is
8 roughly a period from the beginning of the 15th of
9 February at about 5:30 p.m. And this is of interest
10 because of what happened on the 15th and 16th of
11 February.
12 So, February the 15th, at around 5:30 p.m.,
13 roughly speaking, there was an emergency meeting by the
14 Public Utility Commission of Texas, in which they
15 directed ERCOT to do two things, roughly speaking. One
16 is they said to ERCOT to set the prices to a cap of
17 $9,000 during periods of load shedding. So, this is
18 important for us to understand that during periods of
19 load shedding -- and which means that the system does
20 not have enough reserve capacity to serve all the load
21 that might be out there. And those time periods, set
22 the prices to a system cap of $9,000.

1 The idea here being "let's attract more
2 generation into the mix if we can." So that was point
3 one that they did.
4 The second directive they essentially
5 instructed ERCOT to do was to make this change
6 retroactive to the morning of February the 15th. So
7 roughly from 1:00 a.m. in the morning until about 5:30
8 pm, whatever the prices had been, they were reset to
9 $9,000 a megawatt hour.
10 Next day, on the 16th of February at 1:00
11 p.m., in another emergency meeting PUCT rescinded the
12 retroactive portion of these -- of the price change --
13 of the order from the previous day. As a result of
14 this rescinding, prices from 1:00 a.m. to 5:30 p.m.
15 were restore to the original levels, roughly $6,000 on
16 average. The forward price gap of 9,000 continues.
17 All right. So now, let's move forward in
18 time. And so, the prices are at $9,000. And remember,
19 at this time period, there are lots of issues going on
20 the ground in terms of making sure that there is
21 availability. And PUCT was also not only looking at
22 the wholesale market, but they're looking at the

1 regional market also. They're looking at, you know,
2 making sure electricity is available for emergency use,
3 et cetera, et cetera. There's lots of things going on
4 over here.
5 At some point of time, there started being a
6 lot of discussion around repricing. And the essential
7 push for this came from the notion that we mentioned
8 before about consumers who had contracts, who had
9 retail contracts, linked to wholesale prices. They
10 started facing massive bills for their home electricity
11 consumption.
12 Reports of tens of thousands of dollars'
13 worth of bills showing up on their doorstep. Because
14 of this, there was tremendous pressure by the Texas
15 Legislature to retroactively change the prices. That
16 was the mechanism that they chose that caught
17 everybody's imagination to begin with. And this
18 resulted in a very strong debate.
19 Now, on the other side of the debate was --
20 were people -- were arguments being made about market
21 integrity and finality of markets. And once the market
22 has settled, it should be allowed to settle at that

1 price, et cetera.
2 Then on the 4th of March, ERCOT Independent
3 Market Monitor, Potomac Economics issued a report. And
4 essentially what they said was that for a period of
5 time, from about the beginning of the 18th of February
6 until about February 19th, 9:00 a.m., the $9,000 price
7 cap was done in error. Because at that time the system
8 was not -- did not qualify for emergency action. They
9 were not engaged in load shedding.
10 This refired the whole debate about whether
11 to reprice or not. And this debate continued for about
12 -- until about early March. It was well after the
13 storm had gone and prices had come down to standard
14 levels, to normal levels. And Potomac Economics'
15 initial impact was -- initial estimate of impact was
16 about $16 billion. I think later they revised it
17 downwards because of inter-affiliates' reactions, et
18 cetera. Now, over time, the Texas officials eventually
19 abandoned their efforts at repricing.
20 So that's the story. And now Bill is going
21 to talk about exactly what happened on the CFTC side.
22 But I will start off by saying a couple of points of

1 interest.
2 When the first repricing happened, of course
3 it affected futures markets because, you know, they
4 were right in the middle of it. However, the prices
5 got fixed when the contracts were -- had not been
6 settled as yet. The futures contracts that are most
7 affected by those have a five-day settlement window.
8 And so, they haven't gone through final settlement yet.
9 ERCOT hadn't issued the final invoices yet.
10 Whereas when we look at the second period of
11 the debate, the period of interest was February 19 --
12 up to the February the 19th. However, the discussion
13 and debate was going on until March. And by this time,
14 ERCOT eventually along the way, they issued the final
15 invoices, futures markets went into settlement. So
16 that went a completely different way in which we had to
17 think about it.
18 Now, I'm going to turn it over to Bill
19 Heitner to talk about the issues that CFTC faced, the
20 actions they took, et cetera. Bill?
21 MR. HEITNER: Thank you Rahul. Next slide,
22 please.

1 My name is Bill Heitner, I'm an Associate
2 Director in the Risk Surveillance Branch for the
3 Division of Clearing and Risk. The Risk Surveillance
4 Branch is responsible for identifying risks in cleared
5 futures and swaps markets, ensuring that those risks
6 are properly managed.
7 We did discuss the potential impact of ERCOT
8 electricity repricing and how DCR monitored these
9 markets. As Rahul mentioned, the PUCT and Texas
10 officials discussed the possibility of retroactively
11 repricing ERCOT electricity. Repricing has potential
12 to affect futures markets as many of the most active
13 futures contracts cash-settle to posted ERCOT prices.
14 The notional value of contracts that could
15 have been affected was several billion dollars. To
16 further complicate matters, these futures contracts had
17 gone through final settlement while the debate on
18 repricing was still ongoing. At this point, any change
19 to the settlement would have resulted in post-
20 settlement cash calls and payments.
21 Exchanges have a process for repricing
22 futures contracts post-settlement. These changes are

1 relatively small and result in immaterial variation
2 payments. The repricing being discussed in Texas would
3 have affected a large number of futures contracts, and
4 the price change would have been in the hundreds or
5 even thousands of dollars per contract.
6 DCR estimated the size of these potential
7 payments and determined that several clearing members
8 would have had to make fairly large payments, but not
9 greater than payment they make on a regular basis. The
10 effort to reprice ERCOT electricity were eventually
11 abandoned. So, there was no impact from repricing on
12 clearing members.
13 Next slide, please. While the debate on
14 repricing was ongoing, staff closely monitored
15 developments at the PUCT and the State of Texas. Staff
16 held regular discussions with DCOs, FCMs, and DCMs to
17 understand their views and concerns. DCR monitored
18 margins, positions, and cash flows on a daily basis to
19 identify risks in the clearing system.
20 DCR identified clearing members and customers
21 with exposure to repricing futures. They verified the
22 DCOs were collected from clearing members on time and

1 contacted clearing members to ensure they had adequate
2 capital and liquidity, and were collecting from
3 customers. Throughout this period, futures markets
4 operated as expected, and there were no problems in
5 clearing or settlement.
6 This concludes our presentation, and we're
7 happy to take questions.
8 MR. VARMA: And Bill, just in conclusion, one
9 thing that I would say is that overall while there was
10 a lot of stress on the system overall, in general, we
11 can say that the futures market system, including the
12 market, the clearing, et cetera, they all worked as a
13 design. And we've monitored the market, as Bill
14 pointed out, to make sure that that -- all of that was
15 working fine and to serve the purpose of which they're
16 designed. Thank you.
17 CHAIR WIGGINS: I have not seen any
18 indication that our Associate Members have any comments
19 or questions. Abigail, is that correct?
20 MS. KNAUFF: I don't see any Associate
21 Members. We do have two Members, beginning with
22 Demetri Karousos.

1 CHAIR WIGGINS: Yes, Demetri, please go
2 ahead. I know you've got a tight timeframe here.
3 (Brief Pause.)
4 CHAIR WIGGINS: We can't hear you.
5 MR. KAROUSOS: Can you hear me now?
6 CHAIR WIGGINS: Yes, please go ahead.
7 (Brief Pause.)
8 CHAIR WIGGINS: Now we lost you again,
9 Demetri, I'm sorry.
10 MR. KAROUSOS: How about now? Oh, wonderful,
11 I need to have everything unmuted. Okay.
12 Less of a question, more of a comment. Just
13 wanted to thank the CFTC during that time when you were
14 in regular contact. And it was helpful and thoughtful
15 for us to be able to share what we were seeing and hear
16 the CFTC's perspectives. So, we welcomed their regular
17 outreach to us.
18 We want to affirm the statements made just
19 now about how the market performed. We were quite
20 pleased with our risk models' performance. We didn't
21 need to make any parameter adjustments to our market
22 margin models. They worked seamlessly throughout that

1 period.
2 And to get a little technical, when you're
3 monitoring the performance of the margin model, you
4 look at what's called your breach activity, the number
5 of times where variation margins, or the profit and
6 loss on a portfolio exceeds the margin requirement.
7 Despite the hectic activity we saw throughout that week
8 in ERCOT, we only had one day of breaches. And our
9 overall margin model, again, without any parameter
10 changes, was well over 99.7. I think it's more like
11 99.8 percent during that time. So, we were quite
12 pleased with how that the model performed and how our
13 market made it through.
14 And to be clear, that was quite a volatile
15 period. But, you know, we are designed -- and, you
16 know, we were launched to serve the power market, and
17 are quite pleased, again, with how that performed.
18 The only other comment I would offer is that,
19 you know, we work together with our clearing member
20 partners in providing this management solutions to the
21 marketplace. Clearing members are critical piece,
22 critical - they guarantee the performance of the market

1 participants.
2 As you can imagine, some clearing members
3 have taken a pause, just with regards to that market
4 volatility, and are questioning whether they want to
5 continue to support power, in ERCOT in particular. And
6 we would just offer -- you know, the vast majority of
7 the clearing members are fully supportive and continue
8 to be quite pleased, again, with how this market
9 continued, and want to continue to offer this service.
10 But we just want to continue to emphasize
11 that this whole day has been primarily focused on
12 carbon markets. And from our perspective, when we
13 think of ESG and the broader environmental movement, it
14 all kind of begins with electricity. Electrifying
15 everything is the buzzword with how we will get to our
16 climate objectives.
17 And you can't really be about “E” in
18 environmental, if you're not about “E” in electricity.
19 We need to see robust, continued support of electricity
20 markets to see the plans built that will help us get to
21 the future we're all trying to achieve here.
22 So, we just want to continue to assisting

1 clearing members who are concerned --
2 MR. SLOCUM: Demetri, excuse me.
3 MR. KAROUSOS: -- you know, these kind of
4 periodic bursts of volatility. Of course, we saw
5 earlier in 2014, during the polar vortex that affected
6 the East Coast. The market survived, the market did
7 well, and not a single clearing member defaulted. It
8 was well managed. And I just want to remind clearing
9 members that in their commitment to ESG policies, they
10 need to remember that the "E" also stands for
11 electricity.
12 Thank you for allowing me to speak and for
13 commenting today.
14 CHAIR WIGGINS: Thank you. Tyson, I think
15 you had a comment you want to offer?
16 (Brief Pause.)
17 CHAIR WIGGINS: Tyson, we can't hear you.
18 (Brief Pause.)
19 CHAIR WIGGINS: Tyson, we're still not able
20 to hear you. Does someone else have another comment?
21 MR. SLOCUM: Are you able to hear me now?
22 CHAIR WIGGINS: Yes, go ahead.

1 MR. SLOCUM: Sorry for that technical snafu.
2 Thank you, Dena. I just want to quickly thank Rahul
3 and William for their excellent presentation.
4 I'm really glad that it appears that the
5 futures market worked as designed. We unfortunately
6 can't say the same for the spot market. Those
7 extremely high prices came at a time of serious market
8 dysfunction.
9 And we actually sent comments to the Federal
10 Energy Regulatory Commission. They have some statutory
11 authority to step in and change some aspects of the way
12 that bought prices are reported. And we have asked
13 FERC to make some changes as part of an open rulemaking
14 over there at the commission.
15 But I just want to commend CFTC staff because
16 on your end, it looks like the market worked as
17 designed. So, thank you very much.
18 MR. VARMA: Thank you
19 CHAIR WIGGINS: Does anyone have a comment?
20 Sean, I see you have to turn on your monitors. Would
21 you like to offer a comment?
22 MR. COTA: I, again, as Tyson said, commend

1 the CFTC staff for the great analysis in this human
2 tragedy that occurred in Texas. This is a -- as we
3 migrate to electrifying everything, this is going to be
4 a common occurrence. And the grid as you electrify,
5 particularly for heating related peaking needs, the
6 grid is going to be blacking out on an increasing
7 basis.
8 So, the question that I have is, has anyone
9 in the staff heard of pricing of resiliency into any
10 contracts? Because resiliency of the grid,
11 particularly in peaking -- thank God parts of the
12 country had natural gas in order to supply the peak.
13 But there are large -- particularly as we deploy
14 significant renewables, resiliency in the grid is going
15 to be an ever-increasing problem.
16 Is there any talk of pricing -- adding
17 resiliency in a pricing mechanism to any of these
18 trades?
19 MR. VARMA: I think -- if I may just say, I
20 think that would be more a question for FERC, since our
21 futures contracts, you know, derive from the physical
22 market, particularly in this case. As we said, our

1 futures contracts settle to whatever the price is
2 produced by the RTO.
3 MR. COTA: I think that makes sense. And I
4 applaud Tyson for asking for these hard questions.
5 Unless the contract specification is done in a way that
6 keys in resiliency from whoever that is, you're not
7 going to get a price. And if you're not going to get a
8 price, then you have the perverse cash market incentive
9 to create chaos, whether intentional or, "Oh gee, we're
10 supposed to pay attention to that." Those are my just
11 general concerns.
12 So, I -- Tyson, if you need assistance with
13 that, certainly, I'd be happy to work with you on that.
14 MR. BLAND: Sean, there is one -- it's not
15 priced into the contract itself. This is Trabue Bland
16 from ICE. You might -- but there is -- well, at least
17 in Texas, there was ancillary services. And that is an
18 all-encompassing term for what I think what you're
19 talking about, which is the cost of keeping the grid up
20 and running.
21 And in fact, during this time period, it
22 actually went over $9,000. I think it might have

1 capped out at $24,000. So, there might be contracts
2 like that. They're separate from the underlying
3 contract that might address your concern. It's a good
4 point, though.
5 MR. COTA: That’s perfect. Is that something
6 you could share with the group?
7 MR. SLOCUM: Sure, yeah. It's a -- I'll dig
8 up the definition and post it here in the chat.
9 CHAIR WIGGINS: Abigail, I don't see any
10 other Members or Associate Members who are asking to
11 speak. Is there anything else before we move to the
12 Commissioners?
13 MS. KNAUFF: I don't see any other questions
14 from Members or Associate Members. So, we can head to
15 the closing remarks now.
16 CHAIR WIGGINS: I think we need to ask if the
17 Commissioners have any questions on that panel before
18 we go to closing remarks.
19 MS. KNAUFF: Apologies.
20 CHAIR WIGGINS: All right. Do any
21 commissioners have a comment or a question for the
22 panel?

1 No? Okay.
2 Well, with that, we will move to closing
3 remarks.
4 So, I want to thank everyone for
5 participating today. I know we ran a little late,
6 which may just signify that there is much to talk about
7 in all of the topics that we covered today. So, thank
8 you, everyone, for hanging in for the long day here.
9 And with that, I just want to comment that
10 we'll look forward to our next meeting, which I think
11 as Commissioner Berkovitz said at the outset of today's
12 meeting, we're hopeful that the next one can be in
13 person, and we can all be in the same room again. But
14 that date will to be determined. And we'll look to
15 Abigail for further information and polling about when
16 that date might be scheduled.
17 So, with that, Abigail, I'll turn it back
18 over to you.
19 MS. KNAUFF: Thank you, Dena. I now
20 recognize the Acting Chairman Behnam to give his
21 closing remarks.
22 ACTING CHAIRMAN BEHNAM: Thanks, Abigail,

1 first for that introduction, and then of course thanks
2 for all your work. Dena, thank you for your work as
3 Chair, excellent. Mr. Berkovitz, tremendous effort
4 here in leadership. And to all the members, a really
5 great conversation, as evidenced by the fact that we
6 went over. But really great question and answer
7 periods about these issues, which are difficult.
8 And there are so many elements that I think
9 we need to continue discussing. And I think this
10 committee will continue to do it, the Commission will.
11 I'm really looking forward to more engagement with all
12 of you. So, hope everyone's doing well. And thanks to
13 everyone. And I will echo Dena's remarks that I hope
14 we can be together the next time we meet in the next
15 few months. Thank you.
16 MS. KNAUFF: Thank you. I now recognize
17 Commissioner Stump to give her closing remarks.
18 COMMISSIONER STUMP: Thank you, Abigail. And
19 thanks to -- again, thanks to everyone who helped
20 organize the meeting. I'll be very brief.
21 I thought the discussions relative to the
22 various developments in the carbon markets were

1 fascinating and really important to the work we have to
2 do with at the Commission, both with regards to the
3 contracts we currently have, that we oversee, and the
4 potential for additional new contracts that may rely
5 upon information from these underlying primary markets.
6 So, thank you all for putting together such a marvelous
7 group of presenters.
8 With regard to the last panel, I did want to
9 say to Rahul and Bill, and to everyone at the agency
10 who has endured the past year, I think all of the
11 Commissioners would agree that we've had a number of
12 what I can only call nail-biting days at the agency
13 during the course of the past year.
14 And to those of you who manage these markets
15 and contribute to the infrastructure, from the clearing
16 members to the clearing houses, to the exchanges, I
17 think it's really a testament to our system that while
18 it was uncomfortable on a number of different days --
19 none of us signed up for comfortable jobs. We knew
20 when we signed up for these jobs, there were going to
21 be days like this. We just happened to have a lot of
22 them in 2020.

1 And I'm not trying to minimize the underlying
2 concerns. As a Texan myself, I have many family
3 members who are directly impacted. But I do want to
4 commend the derivatives market participants and
5 infrastructure providers, and the Commission and the
6 staff, for the way in which the entire situation was
7 handled. Thank you.
8 MS. KNAUFF: Thank you. Thank you,
9 Commissioner Stump. I now recognize Commissioner
10 Quintenz to give his closing remarks.
11 COMMISSIONER QUINTENZ: Thank you, Abigail.
12 No official closing remarks from me. But I just,
13 again, would like to thank Commissioner Berkovitz for
14 his great leadership of this -- not only the wonderful
15 meeting, but the Advisory Committee; to you Abigail; to
16 Dena; all the presenters that I thought did a fantastic
17 job and put a lot of time and effort and original
18 thought on just some very complicated issues, and laid
19 them out for all of us to understand in a very clear
20 and straightforward way. So, thanks again, appreciate
21 the time.
22 MS. KNAUFF: Thank you. I now recognize

1 Commissioner Berkovitz to give his closing remarks.
2 COMMISIONER BERKOVITZ: Thank you. And I
3 thank my colleagues -- thank you, Commissioner Quintenz
4 and Commissioner Stump for your great support of this
5 committee.
6 And of course, Chairman Behnam, who as I
7 noted earlier, really has been a leader on the climate
8 change issues for a number of years now. The
9 groundbreaking market risk subcommittee report on
10 climate change really will continue to inform and guide
11 our actions as we go forward. And today's effort
12 really builds off that. So again, I thank you,
13 Chairman Behnam.
14 Obviously, Dena, Abigail, and Lucy, thank you
15 all very much for putting this together. Dena, you did
16 a yeoman's job today over the past six hours. I think
17 since I've been here, this is really a very packed
18 EEMAC meeting. I don't know if we've gone this this
19 long before, but certainly the subject matter compelled
20 it. And Abigail and Lucy for putting this putting this
21 together, and all the hard work behind the scenes to
22 organize the panels and really help facilitate these

1 excellent presentations.
2 And of course, the presenters, our friends
3 who participated from Europe, Hans Bergman and Gordon
4 Bennett, into the evening of their time, we thank you
5 very much. Rajinder Sahota from California, and
6 Secretary Grumbles from my home state here of Maryland,
7 thank you for contributing to today's effort.
8 The success of the CFTC and these advisory
9 committees -- and this is really the value. But we
10 really depend on input from market participants, fellow
11 regulators, stakeholders, public interest groups. We
12 can only do our job to the extent that that we're
13 informed of what's going on. We're a relatively small
14 agency. And so, we really depend on information coming
15 to us. And I thank you all.
16 And I thank also everybody on the third
17 panel, the market participants, and regulators, and
18 other perspectives of -- for the information.
19 I think in order to make progress on this
20 issue, which is going to be a long-term issue across
21 all sorts of market participants and across the globe,
22 really it needs to be a collaborative effort. And I

1 thank our little microcosm today, this meeting is
2 exemplary of the type of collaboration and people from
3 different perspectives coming together and discussing
4 and seeing how we can make progress.
5 So again, I thank everybody. I look forward
6 to working with the committee. And we will facilitate
7 the consideration of the proposal. Obviously, it's for
8 the members to decide what to do. But to the extent
9 that we can support those efforts and facilitate that,
10 we will continue to do so.
11 So again, thank you, everybody. And I look
12 forward to being together, again, hopefully in person
13 in the fall. So, thank you. Abigail, unmute please.
14 Abigail?
15 MS. KNAUFF: Thank you, Commissioner
16 Berkovitz. As an amendment to the roll call earlier in
17 the meeting, I'm stating for the record that EEMAC
18 Members Trabue Bland, Demetri Karousos, and Jackie
19 Roberts, as well as Associate Members Susan Bergles,
20 Sean Cota, Daniel Dunleavy, Paul Hughes, and Delia
21 Patterson have been confirmed separately that they are
22 in attendance for this meeting.

1 Thank you to all the EEMAC Members, Associate
2 Members, and guest panelists for your participation at
3 today's meeting.
4 Please stay well and keep an eye out for our
5 survey for dates for the next EEMAC meeting in 2021.
6 This meeting is now adjourned. Thank you.
7 (Whereupon, at 3:10 p.m., the meeting was
8 adjourned.)
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