June 7th, 2022

Dear Securities and Exchange Commission Chairman Gensler,

Thank you for the opportunity to comment on the proposed rule *The Enhancement and Standardization of Climate-Related Disclosures for Investors* (File Number S7–10–22).[1] The Electric Power Research Institute (EPRI) is a nonprofit corporation organized under the laws of the District of Columbia Nonprofit Corporation Act and recognized as a tax-exempt organization under Section 501(c)(3) of the U.S. Internal Revenue Code of 1986, as amended, and acts in furtherance of its public benefit mission.

This is an important and challenging topic. It is essential for companies to assess climate-related risks and, if needed, manage those risks. The existing scientific understanding and analytical capabilities necessary are nascent but developing and advancing. The development and communication of meaningful climate risk and risk management information could be useful to investors and registrants and help avoid misleading information and the misuse of information that is evident in public dialogue and many current applications.

EPRI has been assessing the science relevant to company-level climate risk assessment, educating, and developing guidance, as well as advancing greenhouse gas (GHG) emissions accounting research and understanding of technical issues. Among other things, our research has helped us identify critical technical considerations for climate risk disclosure rules, including essential elements of company-level risk assessment (EPRI, 2022a).[2] As such, our comments include broader scientific observations to facilitate the development and communication of meaningful climate risk and risk management information as well as technical considerations to specific proposals in the proposed rules.

To develop and communicate meaningful climate risk and risk management information, EPRI observes that:

- The conflation of issues in current public discourse needs to be addressed, e.g., treating GHG goals as risk management or GHGs as a risk indicator.
- Given the state of science and current analytical capabilities, only general and qualitative climate risk disclosure requirements can reasonably be supported at the moment, which is important for the proposed rules to recognize in the timing of their implementation.
- Some of the rule's proposed disclosure metrics (greenhouse gas emissions, internal carbon prices, weather and natural events, emissions goals, asset exposure) do not measure or communicate a company's climate risk.
- Current science provides insights and guidance for companies to develop the capability to meaningfully assess and manage some climate risks, but it is important to recognize scientific limits in understanding and resources.

[1] https://www.govinfo.gov/content/pkg/FR-2022-04-11/pdf/2022-06342.pdf.

[2] *Technical Considerations for Climate Risk-Related Disclosures*. EPRI, Palo Alto, CA: 2022. #3002024244.

Meaningful climate risk information can be developed by:

- Developing clear guidance that accompanies non-risk climate information to avoid misunderstanding and misuse (e.g., greenhouse gas emissions, internal carbon prices, weather and natural events, emissions goals, asset exposure).
- Developing and using scenario analysis that is *reasonable and appropriate* for each company in that it captures and communicates a company's unique circumstances, uncertainties, climate risks, and risk management.
- Developing a definition of transition risk that fully captures the risks associated with uncertainty about low-carbon transitions.
- Facilitating communications on risks and risk management explicitly due to climate change by differentiating changes in physical conditions ("severe weather events and natural conditions") due to climate change from physical conditions historically, as allowed by science.

For meaningful GHG accounting and reporting, it is important to recognize the following:

- Companies may need to adjust their GHG accounting baselines following significant structural changes to their organizational boundaries (e.g., transfer or sale of a subsidiary entity) or a change in their operational boundaries (e.g., transfer or sale of a GHG emitting asset).
- There are many technical issues associated with Scope 3 emissions, including with emissions reduction economic efficiency, emissions accounting accuracy, and the challenges and risks of emissions out of one's control. Explicit risk metrics, rather than emissions reporting, are needed if potential changes in the activities associated with Scope 3 emissions are found to represent a material risk.
- There are definitions commonly accepted by the scientific community for the following terms: *Carbon offsets; Emissions factor; Global Warming Potential;* and *Scope 2 emissions*.
- It is not typically possible to report Scope 2 and 3 emissions on a disaggregated basis due to data limitations.
- Many small and *de minimis* GHG emissions sources are typically excluded from electric company GHG emissions inventories due to the insignificant magnitude of these emissions and the level of resources required to collect the data and calculate these emissions.
- If electric companies were to report Scope 1, 2 and 3 emissions by geographic location (i.e., zip code), this would likely result in thousands of data points.

Detailed comments on each of these observations follow below.

For questions related to our comments, or the research and insights discussed, please contact Steven Rose (srose@epri.com), Adam Diamant (adiamant@epri.com), or David Young (dyoung@epri.com).

Observations Related to Development of Meaningful Climate Risk and Risk Management Information

The conflation of issues in current public discourse needs to be addressed, e.g., treating GHG goals as risk management or GHGs as a risk indicator.

The proposed rules include text aligned with communicating risk and risk management; however, some of the information proposed for disclosure do not achieve that goal and are a source of current public confusion.

There is a tendency to conflate risk management with GHG emissions goals. For example, it is incorrect to assume that if a company has a net-zero GHG goal they do not have low-carbon transition risk, or if a company has GHG emissions they have unmanaged transition risk. It is essential that risk assessment be differentiated from GHG goal setting. The former can inform the latter, helping identify a goal that is consistent with risk management. However, company GHG goals, like net-zero, are typically not derived from a low-carbon transition risk assessment and, as such, it would be incorrect and misleading to consider them as sole indicators of climate risk management for a company. Similarly, pursuing public climate policy objectives (e.g., international, national, state) is also not a risk management proxy for a company. A GHG goal, and companies within jurisdictions with GHG goals, still have uncertainties with which to contend, and therefore risks that need to be communicated and managed.

Other metrics cited in the proposed rule are also not, in and of themselves, risk metrics. This includes GHG emissions, weather and natural events data, internal carbon pricing, and asset exposure. In most cases, such metrics only indicate that there may be a risk. Knowing whether there is a risk requires an explicit assessment of the potential implications—consequence and likelihood (i.e., the risk)—of transitioning into an uncertain future with different plausible climate, weather, climate policy, and other conditions (e.g., market, technology). Importantly, it also requires knowing how well the risk is being managed by the company's strategy.

Given the state of science and current analytical capabilities, only general and qualitative climate risk disclosure requirements can reasonably be supported at the moment, which is important for the disclosure rules to recognize in the timing of their implementation.

From a scientific point of view, most companies are not in a position presently to comply with the proposed rule and provide meaningful climate risk and risk management information. Scientific understanding is lacking, and guidance, data, and analytical tools for company climate risk assessment and strategy identification are only just developing. Furthermore, there are scientific understanding limitations that are important to understand and recognize (e.g., scientific capability to detect and evaluate changes, model specific variables, and quantify uncertainty). In EPRI's many engagements with companies and stakeholders on this topic, we encounter unfamiliarity with the relevant science and how to apply it, as well as a conflation of issues (as noted above). Scientific education, analytical guidance, and data and tool development are a key part of the path forward and should be considered in the implementation timing of the rules.

Given the state of scientific understanding and capability needed for assessing transition and physical climate risks, only general and qualitative disclosure requirements for communicating climate-related risks and risk management can reasonably be supported at present across companies. At this point in

time, a general framework with procedural guidance would provide companies with the ability to identify company-specific uncertainties, risks, and opportunities, and provide flexibility for each company to qualitatively identify company-specific solutions for managing those risks and opportunities. It is essential to recognize that 'standardized' quantitative scenarios across companies (e.g., global GHG emissions pathways) would not be suitable for all companies within a sector, much less across sectors. A general structure ensures the flexibility needed across companies for assessing and communicating their individual climate risks and risk management as is possible given current capabilities.

Over time, comparability can be meaningfully pursued through a comparable risk assessment process, as opposed to standardized quantitative inputs (EPRI, 2022a). A meaningful and reliable assessment of an individual company's risk, as well as differences in risk between companies, can be achieved with companies using conceptually common steps and metrics for assessing and communicating risk that informs the design and communications of company-specific tailored scenarios and analysis, properly captures each company's unique risks and risk management, and appropriately informs investors. Companies will need to communicate some level of what they have evaluated, their risks, and their risk management to establish that what they have done is *reasonable and appropriate*. Conversations regarding communications and metrics are needed to facilitate this path forward.

Some of the rule's proposed disclosure metrics (greenhouse gas emissions, internal carbon prices, weather and natural events, emissions goals, asset exposure) do not measure or communicate a company's climate risk.

As noted, the proposed rules call for disclosure of some information that does not characterize company risk or illustrate risk management. Examples include GHG emissions (e.g., §229.1504, §210.14-02(d)), weather and natural events (e.g., §210.14.02(c),(e),(g),(j)), climate-related targets or goals (§229.1506), internal carbon pricing (§229.1502(e)), and asset exposure (e.g., §229.1502(a)(1)(i)(A),(B)), none of which are explicit indicators of climate risk.

For example, GHG emissions (all scopes), and weather and natural events, only indicate that there may be a risk. Knowing whether there is a risk requires assessment of the potential implications and likelihood (i.e., the risk) of transitioning into an uncertain future with different possible climate, policy, and non-policy conditions. It also requires knowing how well the risk is being managed by the company's strategy. Similarly, information about climate-related targets or goals is not about climate risk assessment or risk management, unless those targets/goals were derived from them. Furthermore, targets/goals have uncertainties with which to contend, and therefore risks to communicate and manage. Likewise, internal carbon pricing is not a climate risk indicator. It is simply a planning proxy for potential climate policy, and only one of many relevant policy types given the variety of potential state and federal climate policy designs companies may face (e.g., renewable portfolio standards, clean energy standards, cap-and-trade, carbon prices, GHG source and technology requirements or constraints, allowance markets, and other design details).[3] Lastly, the proposed rule refers to disclosure of asset exposure (e.g., assets exposed to flooding or water stress). While exposure information is a part

[3] Note that internal carbon prices should not be estimates of the social cost of carbon (SCC) and they should not be evaluated relative to SCC estimates as this application is not a benefit-cost exercise, but instead one of cost-effectiveness, and managing uncertain costs associated with climate policy and other factors. See EPRI (2021), Rose and Bistline (2016), and Rose (2017) for discussions of technical issues associated with using SCC estimates, including for carbon pricing.

of the information needed to assess risk, it is insufficient as a measure of risk. It only indicates that something is potentially in harm's way, not the impact of it being in harm's way, the likelihood of that impact, and how that risk (likelihood x impact) is being managed. The difference between exposure to climate change and the resulting risk from that exposure is essential to recognize and not confuse.[4]

In addition to computing the right type of metrics for communicating climate risk, it is important to consider the different potential categories of climate risks, as well as the resolution of risk information. Only some of the climate risk categories noted in the proposed rule (for instance, in §229.1502(a)(1)(ii)) are objective, quantifiable risks associated with future potential climate change and policy.

The resolution of risk disclosure is also an issue to consider. The proposed rule is not fully clear on the resolution of risk it proposes. Specifically, it is unclear if asset level disclosure is being suggested. If so, this would be problematic given that the value (and risk) of many assets is a function of that asset's role in a broader system and decision context. It is important to understand and manage risk beyond the asset—in terms of the overall business, connected systems, the multiple potential dimensions of value (e.g., for electricity generation assets, these include energy, capacity, and system balancing).

Current science provides insights and guidance for companies to develop the capability to meaningfully assess and manage some climate risks, but it is important to recognize scientific limits in understanding and resources.

While technical capabilities for company-level climate risk assessment are still developing, the broader science provides useful methodological guidance that should be considered. In particular, EPRI's research (e.g., Rose et al, 2020, 2018) has evaluated the scientific literature defining the relationship between a company and potential global climates and climate goals, including the extensive body of global scenario resources from the Intergovernmental Panel on Climate Change (IPCC), International Energy Agency (IEA), and others. These analyses produce scientific observations from which we are able to derive technical principles for methodology development and evaluation—principles that are informing others' scenario guidance as well (e.g., TCFD, 2020).[5] This work has produced insights and guidance for assessing the climate risk of non-financial and financial companies, as well as for assessing methodologies and setting GHG goals.

For instance, EPRI's assessment of the science yields a set of technical principles for low-carbon transition risk assessment methodologies (Rose and Scott, 2020, 2018):

- Consider the climate-related and non-climate-related uncertainties relevant to companies:
    - Uncertainty in the relationship between global average temperature and GHG emissions, with uncertainty increasing with geographic and economic resolution.
    - Uncertainty about the attainability of global emissions pathways.
    - Uncertainty regarding the design details of potential climate policies.
    - Uncertainty regarding everyday non-climate-policy factors, such as input market prices, goods and services demand, and future production and demand technologies.

[4] Asset level information can also be misleading given that the value and risk of many assets is a function of their role in systems and markets. Thus, location specific details (e.g., by zip code) is not very meaningful for understanding potential losses and opportunities.

[5] TCFD, 2020. *Task Force on Climate-related Financial Disclosures: Guidance on Scenario Analysis for Non-Financial Companies* cites EPRI's technical principles for developing and assessing climate risk assessment methodologies.

- Consider the significant limitations of global emissions pathways as benchmarks for guiding or evaluating company emissions strategy.[6]
- Consider company-specific characteristics and context.
- Consider non-uniform goals that can vary from one company to the next consistent with their unique contexts and opportunities.
- Provide flexibility for a company to adapt their strategy appropriately as the future unfolds.
- Quantitatively compare alternative strategies given possible company futures.
- Evaluate strategy robustness and resilience relative to a company's alternative plausible futures.
- Consider the full set of company objectives (e.g., service, environment, and business) and the full (system and services) value of company assets and investments.

Each of the technical principles represents a necessary condition for a scientifically grounded methodology. The technical principles also represent a checklist that inform development of a climate risk assessment methodology and can also be applied to existing methodologies to assess consideration of the science. Overall, the technical principles highlight that there are five key issues that companies need to somehow consider and address:

1. *Uncertainty* about plausible combinations of future climate and non-climate factors that define future conditions, opportunities, and costs.
2. *Uniqueness* of each company's assets, markets, systems, uncertainties, etc. that define their risks and opportunities and differentiate them from others.
3. *Multiple objectives* that the company pursues, manages, and balances, including environmental, service reliability, and affordability objectives.
4. *Flexibility* required to respond as the uncertain future unfolds.
5. *Robustness* as represented by strategies that are resilient to the plausible alternative futures.

Meaningful Climate Risk Information Can Be Developed By:

Developing clear guidance that accompanies non-risk climate information to avoid misunderstanding and misuse (e.g., greenhouse gas emissions, internal carbon prices, weather and natural events, emissions goals, asset exposure).

As discussed above, the proposed rules would require disclosure of specific information that does not characterize company climate risk or illustrate risk management. For example, the following are not indicators of climate risk: GHG emissions, weather and natural events, climate-related targets or goals, internal carbon pricing, and asset exposure. Such information has been found to be prone to misunderstanding and misuse in public discourse.

[6] Rose and Scott (2020) discuss the limitations of global emissions pathways as benchmarks for guiding or assessing companies. For instance, there are many global pathways consistent with a temperature level and therefore many potential, but very different, benchmarks. Furthermore, global models model aggregate sectors and markets, not companies, actual markets, or individual company contexts and uncertainties; and, global scenarios have strong assumptions (e.g., climate policy, technology) that are uncertainties for companies and therefore potential risks they need to consider. Based on these and other technical issues identified from assessing global emissions pathways, Rose and Scott (2020) conclude that global pathways data (e.g., emissions or specific economic or energy system details) are not good benchmarks for evaluating or guiding company emissions strategies or goals.

To avoid misunderstanding and misuse of information, clear guidance will be needed when disclosing non-risk information. Specifically, guidance that this information is not an explicit indicator of climate risk and that the potential implications of future transitions and climate uncertainties need to be directly evaluated, managed, and communicated.

Developing and using scenario analysis that is reasonable and appropriate for each company in that it captures and communicates a company's unique circumstances, uncertainties, climate risks, and risk management.

Scenario analysis is a valuable input to company planning. It is an approach for evaluating uncertainties, identifying risks, and evaluating risk management options. It is very difficult to assess future risks associated with potential future climates and societal low-carbon transitions without considering and analyzing alternative potential future conditions. Scenarios are not forecasts or best guesses, but instead a set of "what ifs" representing different plausible futures relevant to a company's planning. They are defined by both climate-related and non-climate-related uncertainties; and, among other things, an analysis may reveal that the former is less important than the latter for a company. Scenario analysis also defines the needed counterfactual for characterizing the effects of risks on strategy, business model, and outlook—all items of interest in the proposed rules.

Scenario analysis is inherently forward-looking and exploratory, having to somehow consider the array of plausible future conditions relevant to today's operations and planning decisions. Scenario analysis does not attempt to predict the future, it simply tries to consider the possible futures. As such, it can never be right with respect to every possibility. What is important is that the scenario design be *reasonable and appropriate* in that it encompasses the space of plausible and relevant potential future conditions for an individual company. EPRI's ongoing research is helping companies define the company-specific risk space for assessing their risks, stress testing potential strategies, and identifying enabling conditions.

Meaningful climate risk information can be created from reasonable and appropriate scenario analysis that properly captures and communicates a company's unique circumstances, uncertainties, risks, and risk management strategy.

Developing a definition of transition risk that fully captures the risks associated with uncertainty about low-carbon transitions.

The definition of transition risk in the proposed rule (§229.1500(c)(4)) is circular: defining transition risk as a part of climate-related risk, but then defining transition risk as risk associated with addressing climate-related risk.

Low-carbon transition risk is about much more than emissions:

- First, there are many ways to manage emissions (e.g., changing inputs, changing operations, changing technologies, purchasing emissions offsets, purchasing emissions allowances) that need to be accommodated; however, emissions cannot capture these factors and the potential and uncertain opportunities for managing a low-carbon transition.
- Second, companies are frequently managing their business for multiple objectives, where emissions are but one objective.

- Third, different policy designs are possible, with each creating a different type of emissions reduction incentive and implying different practical emissions strategies, challenges, and costs for a company.

There are also many non-climate-policy uncertainties that influence a company's practical emissions reduction strategy. Thus, a company's low-carbon transition risks and opportunities are defined by significantly more than the level of their emissions. Companies need strategies robust to all plausible transition possibilities, including considering climate policy stringency and design uncertainty, as well as non-policy uncertainties. As a result, climate risk information will be more meaningful if the definition of transition risk captures all risks associated with uncertainties about low-carbon transitions.

Facilitating communications on risks and risk management explicitly due to climate change by differentiating changes in physical conditions ("severe weather events and natural conditions") due to climate change from physical conditions historically, as allowed by science.

In multiple sections (§210.14.02(c), (e), (g), and (j)), the rules propose disclosing physical risk (i.e., financial impacts and expenditures). However, the proposed text does not differentiate "severe weather and natural conditions" due to climate change from those that arise under *historical* conditions. This is an important distinction because:

- As allowed by scientific understanding, characterizing severe weather impacts under *historical* conditions forms the *counterfactual* – a reference physical condition – needed for evaluating *new risks* arising from changes in physical conditions due to climate change.
- Distinguishing changes due to climate change is necessary to help companies characterize and address *new risks* and justify resiliency investments.

It is potential shifts in the likelihood of physical conditions due to climate change that are of interest and relevant for identifying and addressing potential new risks.

Note that, scientific capability and fidelity to detect and quantify changes varies substantially from one climate variable to the next. Working with the scientific community will be crucial for developing the fidelity characterizations and likelihood shift quantifications needed for power sector physical climate risk assessments.

Also, as noted above, the presence of potential physical impacts is not in itself indicative of risk, only that there may be a risk that needs to be evaluated.

Observations Regarding GHG Accounting and Reporting

EPRI notes that GHG emissions data are not *climate risk metrics* per se. The following observations raise technical issues associated with GHG emissions accounting relevant to the proposed rule.

Targets, Goals, and Baselines

§229.1506(a)(4) would require registrants to "…disclose the defined baseline period and baseline emissions against which progress will be tracked…". The proposed rule does not appear to address if and how a registrant may adjust their baselines following significant structural changes to their organizational boundaries (e.g., transfer or sale of a subsidiary entity) or a change in their operational boundaries (e.g., transfer or sale of a GHG emitting asset). Nor does the proposed rule appear to

address if registrants are required to or may choose to disclose changes or adjustments to their targets and goals. Over time it can be expected that registrants may wish to adjust their targets and goals in response to ongoing changes in their business operations, climate-related risk analysis or risk management strategy, changes in the regulatory and market environments in which they operate, and/or evolving scientific knowledge about climate change and its impacts and other factors.

Changes to Organizational Boundaries and Historic GHG Data Reporting

§229.1504(e)(2) would require the organizational boundaries registrants use for GHG accounting purposes be based on the same set of accounting principles applicable to a registrant's consolidated financial statements. However, it is not clear whether and how a registrant may need to adjust historic, previously disclosed Scope 1, 2 and 3 emissions following the sale or transfer of corporate assets or subsidiaries. The GHG Protocol recommends any substantial changes in an entity's organizational or operational boundaries be made retroactively following the sale or transfer of assets, and historic annual GHG reporting be adjusted to reflect changes in the entities' organizational and operational boundaries.

§229.1504(e)(2) makes clear that a registrant must include as Scope 3 emissions any emissions that have been "outsourced" that previously were part of its own operations. This may be applicable, for example, to an electric company which has entered into a contract to buy the electricity output from an electric generating unit (EGU) it previously owned and sold or transferred to another party. However, the proposed rule does not make clear how and to what extent a registrant should adjust previously reported Scope 1, 2 and 3 GHG emissions information following the purchase or sale of GHG emitting assets, such as electric power generation stations.

There are many technical issues associated with Scope 3 emissions, including with emissions reduction economic efficiency, emissions accounting accuracy, and the challenges and risks of emissions out of one's control. Explicit risk metrics, rather than emissions reporting, are needed if potential changes in the activities associated with Scope 3 emissions are found to represent a material risk.

§229.1504(c) would require registrants to disclose total Scope 3 emissions if material or if a registrant has set a GHG emissions reduction target or goal that includes its Scope 3 emissions. Fundamental technical issues around Scope 3 emissions suggest it is impractical to track and disclose them (EPRI, 2022a). The technical issues include the economic inefficiency (i.e., excess societal costs) of trying to indirectly reduce emissions through Scope 3 channels; Scope 3 emissions accounting inaccuracies, data challenges, double counting, and uncertain attribution to a company; and the challenges and risks of uncertain emissions that are out of a company's control. Risks associated with low-carbon transitions at these sources are better communicated by explicit risk metrics, rather than emissions.

While some electric companies disclose some categories of Scope 3 emissions, we are not aware of any electric company operating in the United States that has comprehensively evaluated or estimated all of its Scope 3 emissions for all of the potential Scope 3 emissions categories listed in the proposed rule. An informal survey conducted by EPRI in 2021 of 12 different types of electric companies operating across the U.S. (e.g., investor-owned, public / municipal, cooperatives) found that Scope 1 and Scope 2 emissions sources reported by the survey respondents are largely consistent, but there is greater

variability in reported Scope 3 emission categories. In this survey, only seven of the 12 companies reported some Scope 3 emissions with 1-4 categories reported.

The results of EPRI's survey also suggest electric companies are likely to need to dramatically increase their efforts to institutionalize GHG emissions monitoring, reporting and verification processes inside their companies if they are to be prepared to disclose their GHG emissions on a comprehensive basis, including Scopes 1, 2 and 3. Only one of the 12 companies who responded to the survey reported it had developed some type of formal GHG Inventory Process Manual, and just eight others reported they have partially developed this kind of internal process documentation.

While the proposed rule requires registrants only to report "material" Scope 3 emissions categories, the registrants likely will need to assess and estimate all of the categories of their potential Scope 3 emissions to determine which ones may be material and need to be disclosed.

Scope 3 emissions also are difficult to quantify, depending almost entirely on a range of assumptions and estimated emissions factor and data. In addition, it can be difficult or even impossible for electric companies to obtain key data from "upstream" fuel providers of natural gas and coal. For example, only a relatively small proportion of the natural gas purchased by gas and electric utilities is purchased through bilateral contracts where the upstream supplier of the gas is known. In contrast, much of the natural gas fuel supply is obtained through natural gas markets so it is not possible to identify individual fuel suppliers or natural gas sources.

Given the nature of Scope 3 emissions and the accounting guidance provided by existing GHG accounting standards, it is very likely the same GHG emissions will be *double counted* and reported by multiple registrants. For example, an electric utility that uses natural gas to generate electricity will be in the same value chain as the natural gas producer that produced and supplied the natural gas and the pipeline that transported that natural gas to the utility's power plant. In this example, each of these three entities (i.e., electric company, natural gas supplier and natural gas pipeline), and with each reporting the emissions of the other within its Scope 3 metrics.

In addition, as discussed earlier, GHG emissions are not a meaningful risk metric, and a variety of technical issues suggest that company management of Scope 3 emissions is economically inefficient.

Locational Emissions (NOPR Questions 107-108)

The SEC proposal includes two questions regarding whether to require registrants to disclose Scope 1, 2 and 3 emissions by geographic location (i.e., zip code) and show these emissions sources on a heat map. For electric company registrants, this requirement likely would result in thousands of data points requiring disclosure (e.g., individual sulfur hexafluoride (a GHG) breaker locations along transmission and distribution lines). Additionally, many electric company emissions sources are not necessarily located in a single geographic location, such as mobile vehicle emissions, or the emission source covers a broad area, such as a power transmission line. EPRI observes that this level of locational disaggregation of emissions is unlikely to be useful to manage or understand any associated physical climate risk.

De Minimis Scope 1 and 2 Emissions:

The SEC proposal does not appear to include any exemption associated with disclosure of *de minimis* Scope 1 or 2 emissions. Many small and *de minimis* GHG emissions sources (e.g., lawn equipment, emergency generators, refrigerants, and others) are typically excluded from electric company GHG

emissions inventories due to the insignificant magnitude of these emissions and the level of resources required to collect the data and calculate these emissions.

Definitions (Part 229.1500)

1. **Carbon offsets** (§220.1500(a)) – As far as EPRI is aware, the proposed rule would include the first definition by a federal agency of this term. The proposed definition of *carbon offsets* is very general and circular in nature. EPRI observes that over the past two decades, the development of carbon offsets has evolved considerably, and there has developed a relatively common understanding of the meaning of this term among climate policy experts and others engaged in developing offset projects and transacting offset credits in both the "voluntary" and "compliance" carbon markets. The term *carbon offsets* also is confusing because many types of offset projects are based on reductions in GHG emissions other than carbon dioxide. EPRI uses the following definition of *carbon offsets* in its ongoing research:

   > ***Carbon offsets (or Greenhouse Gas Offsets)*** *represent additional, measurable, permanent and verifiable GHG emission reductions, or increases in carbon storage or removal, that have been validated and verified by an independent third-party entity; pursuant to a protocol (or methodology) which contains the requirements and guidance to be followed when implementing offset related projects and activities and for the granting of carbon offset (or greenhouse gas offset) credits, that is publicly available at no cost and which has been established by a federal or state regulatory agency or independent body or group which has followed due process procedures, including the broad distribution of the protocol(s) for public comment.*

2. **Emissions Factor** (220.1500(e)) – EPRI observes that an *emissions factor* is a ratio that expresses GHG emissions in terms of units of activity. It is a fraction in which the numerator represents a mass quantity of GHG emissions (i.e., lbs. or metric tons CO_2) within a specific context (e.g., a CO_2 emissions factor for electric power generation in the U.S.) and the denominator represents a unit of activity (e.g., one kilo-watt hour of energy produced). For example, according to the Energy Information Administration (EIA), the annual emission factor for all electricity generation in the U.S. in 2020 was 0.85 lbs. CO_2 / kWh.

3. **Global warming potential (GWP)** (220.1500(f) – The Intergovernmental Panel on Climate Change (IPCC) has an established definition for this term found in the *IPCC's 2001 Third Assessment Report (TAR).* The TAR describes GWPs as "*a measure of the relative radiative effect of a given substance compared to another, integrated over a chosen time horizon*" (TAR, chapter 6.12.1). Carbon dioxide, the so-called reference gas, is assigned a GWP value of 1, independent on the time horizon used or other parameters that can influence GWPs of other GHGs. Annex I to this note contains the mathematical definition of GWPs. (See FCCC/TP/2004/3 (unfccc.int)).

   In the glossary of the TAR, GWPs are defined in more detail as
   "*…an index, describing the radiative characteristics of well mixed GHGs, that represents the combined effect of the differing times these gases remain in the atmosphere and their relative effectiveness in*

absorbing outgoing infrared radiation. This index approximates the time-integrated warming effect of a unit mass of a given greenhouse gas in today's atmosphere, relative to that of carbon dioxide (CO_2).

A related issue is which specific GWP values to use to convert different GHGs to carbon-dioxide equivalents (CO_2e). EPRI observes that the UNFCCC[7] Annex 1 values are commonly used in the scientific literature and accepted by the current U.S. Administration.[8]

4. **Scope 2 emissions (220.1500(q))** – EPRI observes that "transmission line losses" are a source of Scope 2 emissions that are only relevant to "wires only" electric companies who are engaged only in the transmission and distribution of electric power and which do not also generate the electricity transmitted and distributed across their lines.

5. **Scope 3 emissions (220.1500(r))** – The definition of "scope 3 emissions" refers to the "…upstream and downstream activities of a registrant's value chain (emphasis added)." The term "value chain" is not defined in the proposed rule but is important for accurate and consistent estimation of Scope 3 emissions. For example, when an electric or gas utility sells electricity or natural gas to a factory, it is not clear if the "value chain" ends at the factory for scope 3 accounting purposes, or if it continues further downstream to the users of the products manufactured at the factory. The GHG Protocol clearly contemplates a value chain that goes beyond initial customers, but it does not specify the end of the value chain. EPRI is not aware of a commonly accepted definition for value chain.

Disaggregated GHG Emissions Metrics

Section 229.1504(a)(1) of the proposed rule would require a registrant to disclose their Scope 1, 2 and 3 emissions both on *a disaggregated basis* by each constituent greenhouse gas and in the aggregate expressed in CO_2e. Typically, entities that report Scope 2 emissions do so using an emissions factor that relates carbon-dioxide (CO_2) emissions per unit of electricity, steam, heat or cooling that they purchase and consume. Typically, these emissions factors are not available on a disaggregated basis by individual greenhouse gas. A similar issue arises for reporting Scope 3 emissions disaggregated by specific greenhouse gas.

References

Over the last few decades, EPRI has been actively assessing the science, addressing scientific gaps, and developing technical resources and guidance related to company climate-related risk assessment, climate scenarios, greenhouse gas goal (GHG) setting, and GHG accounting. That work has benefitted from numerous critical and constructive conversations with many organizations, including stakeholders in the financial and environmental communities. This work has and continues to inform company climate and ESG reports, risk assessment methods and analysis, and recent activities by stakeholders such as the TCFD, Moody's, and federal requests for public comment, as well as scientific activities, such as the IPCC's newest reports.

[7] United Nations Framework Convention on Climate Change (UNFCCC).
[8] https://unfccc.int/process-and-meetings/transparency-and-reporting/greenhouse-gas-data/frequently-asked-questions/global-warming-potentials-ipcc-fourth-assessment-report

EPRI's climate-related risk, GHG accounting, and social cost of carbon research has in recent years included the following publicly available resources directly relevant to the SEC's efforts:

- *Technical Considerations for Climate Risk-Related Disclosures*. EPRI, Palo Alto, CA: 2022a. #3002024244
- *A Starting Point for Physical Climate Risk Assessment and Mitigation: Future Resilience and Adaptation Planning*. EPRI, Palo Alto, CA: 2022b. #3002024895
- *EPRI Energy Systems and Climate Analysis Group Research on Climate Risk and Resilience*, Electric Power Research Institute, Palo Alto, CA 2022c. #3002023659.
- *EPRI Public Comments on Federal Acquisition Regulation ANOPR: Minimizing the Risk of Climate Change in Federal Acquisitions*. EPRI, Palo Alto, CA: 2022. #3002023465.
- *Greenhouse Gas Emissions Accounting for Electric Companies: A Compendium of Technical Briefing Papers and Frequently Asked Questions*. EPRI, Palo Alto, CA: 2021. #3002022366.
- *Climate Disclosure and Voluntary Reporting Trends: 2020 Activity Survey Results*. EPRI, Palo Alto, CA: 2021. #3002021876.
- *Review of 1.5˚C and Other Newer Global Emissions Scenarios: Insights for Company and Financial Climate Low-Carbon Transition Risk Assessment and Greenhouse Gas Goal Setting*. EPRI, Palo Alto, CA: 2020. #3002018053. (Rose, S and M Scott, 2020)
- *EPRI Comments on Moody's "Proposed framework to assess carbon transition risks for electric power companies."* EPRI, Palo Alto, CA: 2020. #3002020282.
- *Climate Disclosure and Voluntary Reporting Trends: 2019 Activity Survey Results*. EPRI, Palo Alto, CA: 2020. #3002018052.
- *EPRI Energy Systems and Climate Analysis Group Research on Greenhouse Gas Emissions Accounting*, Electric Power Research Institute, Palo Alto, CA 2020. #3002018261.
- *Climate Disclosure and Voluntary Reporting Trends: 2018 Survey Results.* EPRI, Palo Alto, CA: 2019. #3002016948.
- *Grounding Decisions: A Scientific Foundation for Companies Considering Global Climate Scenarios and Greenhouse Gas Goals*. EPRI, Palo Alto, CA: 2018. 3002014510. (Rose, S. and M. Scott, 2018)
- *A Technical Foundation for Company Climate Scenarios and Emissions Goals*. EPRI, Palo Alto, CA: 2018. #3002014515.
- *Repairing the Social Cost of Carbon: Immediate Steps for Scientifically Reliable Estimates and Use*. EPRI, Palo Alto, CA: 2021. #3002020523. (EPRI, 2021)
- *Carbon Pricing and the Social Cost of Carbon*. EPRI, Palo Alto, CA: 2017. #3002011391. (Rose, SK, 2017)
- *Applying the Social Cost of Carbon: Technical Considerations*. EPRI, Palo Alto, CA: 2016. #3002004659. (Rose, S and J Bistline, 2016)