

**Attachment—Additional Questions for the Record**

**Subcommittee on Environment and Climate Change and Subcommittee on Energy  
Joint Hearing on  
“Securing America’s Future: Supply Chain Solutions for a Clean Energy Economy”  
November 16, 2021**

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**The Honorable Diana DeGette (D-CO)**

The Solar Energy Industries Association (SEIA) has developed a Supply Chain Traceability Protocol under which suppliers:

1. Identify the source of a product’s material inputs,
2. Trace the movement of these inputs throughout the supply chain, and
3. Submit to a third-party audit of this information.

U.S. Customs and Border Protection (CBP) has reportedly adopted elements of this Protocol in its review of imported products and materials.

If you are familiar with either the SEIA Protocol or CBP actions, please respond with regard to them. If not, please respond regarding the general concepts mentioned here.

1. What do you think of requiring importers of products, for example, solar modules, to identify the sources of their products' material inputs?

**RESPONSE:**

Additional requirements for importers to identify their products’ material sources will likely facilitate the U.S. government’s actions against forced labor and human rights violations in countries like China while providing American solar module buyers with greater transparency. This requirement, either through the SEIA Protocol or the CBP actions, may yield other positive results such as quantifying the U.S. energy vulnerability to foreign supplies as well as bringing light to the high levels of greenhouse gas emissions from production of clean energy technologies in coal-dependent regions.

This requirement may also pose challenges and shortcomings that outweigh its potential benefits. First, it is dubious that accurate and reliable data can be collected in parts of the world that do not uphold the same high U.S. standards, which defeats

the very purpose of such a requirement. For example, China is known for its poor data quality, and therefore, it might be difficult for U.S. companies to effectively collect sensitive information reliably regarding both the sources and movements of material inputs from their suppliers in that country. Second, such a requirement presents uncertain trade implications. Without a careful, phased approach, the requirement and any resulting changes from it could harm the United States financially. Possible costs include increased trade tensions with China over goods not limited to solar modules, price fluctuations of importing products, and reciprocal measures from trading partners on U.S. export products, including the EU-proposed Carbon Border Adjustment Mechanism (CBAM) that may cause a reduction in U.S. liquefied natural gas exports to Europe.

2. What do you think of requiring importers to trace the movement of these inputs throughout the supply chain?

**RESPONSE**

Tracing import products' material inputs throughout the supply chain has its benefits in addressing forced labor. As in the first question, however, doing so is an enormously challenging task due to the poor quality of data in other countries as well as potential implications for international trade. The process can get further complicated technically and politically as the full participation of all countries throughout the supply chain is necessary for an effective implementation. For maximum effectiveness, foreign suppliers should be required or encouraged by their governments to share their sensitive information with the CBM through their U.S. import partners. Additionally, there may arise technological challenges since data collecting methods, e.g., using smart sensors or blockchain technologies, are nonuniform across different regions and sectors. Other potential drawbacks are discussed in my answer to Question 1.

3. What do you think of submitting this kind of information to a third-party audit by a private entity?

**RESPONSE:**

An independent, third-party audit is important to monitoring and verifying the conformity of an importer's activity against the requirement's criteria. Submitting sensitive information to a private entity auditor should not be of a concern so long as the third-party organization, per the SEIA Protocol, is qualified and independent of the customer-supplier relationship and handles sensitive information under non-disclosure agreements. However, the main problem with the procedure defined by the Protocol is that all information collection and verification activities happen solely between the importer and the auditor in the United States, without any direct audit or verification outside the country. Unless the auditor has a strong, effective presence in a foreign country or countries of interest or at least years of experience monitoring and verifying industrial data from those countries, a third-party audit is simply a review of the documentation presented by the importer. Further, I think it is inadequate to require by the Protocol that relevant information be collect by

“appropriate sampling and should be verified as far as practicable.” Instead, the Protocol should provide a uniform, yet more detailed, set of process steps and criteria to minimize confusion and save the importers’ time and money.

4. What do you think of submitting this kind of information to CBP?

**RESPONSE:**

The importer should share this kind of information (the sources of material inputs and movements throughout the supply chain) with CBP in accordance with U.S. laws. According to U.S. CBP’s *Reasonable Care: An Informed Compliance Publication*: “Under Section 484 of the Tariff Act, as amended (19 U.S.C. § 1484), the importer of record is responsible for using reasonable care to enter, classify and determine the value of imported merchandise and to provide any other information necessary to enable CBP to properly assess duties, collect accurate statistics, and determine whether other applicable legal requirements, if any, have been met.”

5. Do you think the tracking and disclosure of this kind of information can be done credibly without subjecting it to review by CBP for compliance?

**RESPONSE:**

I have no definite stance on this question, but given the reasons I mentioned regarding a third-party audit an additional review by CBP might be necessary to undertake tracking and disclosure more credibly.

6. Are there other measures you would suggest for identifying the sources of the materials and components used to manufacture imports or for otherwise inhibiting or preventing the production and manufacture of materials and products from entities or regions that do not uphold the same high labor and environmental standards as the United States?

**RESPONSE:**

There is no quick fix to this issue due to the challenges of accurately identifying the sources of material inputs and supply chain movements. As such, it might be more impactful to mobilize domestic demand at home than precisely identifying which specific region or company violates human rights abroad. A shifting demand can start from placing a greater focus on promoting the public awareness and understanding of the actual labor and environmental conditions of countries from which solar and other energy materials are imported and of the carbon intensities of imported clean energy technologies.

**The Honorable Fred Upton (R-MI)**

1. A forced energy transition driven by government regulations and mandates for economy-wide net-zero greenhouse gas emissions would require a massive transformation of the world energy complex. Can you provide some additional information on the scale of difficulties relating to net-zero or carbon free energy by 2050?

**RESPONSE:**

The fundamental problem and risks with a forced energy transition is that the cost and functionality of alternative fuels and carbon capture systems remain too high. Four pillars of modern civilization, steel, cement, ammonia (fertilizer), and plastics have no cost-effective substitute at scale. Cost is the primary constraint and regions of the world facing large population growth and requirements to lift living standards will not be able to absorb such costs and nor will there be any political consensus to accept reduced living standards to achieve so-called “net-zero” goals. Population growth, rising incomes, and economic fundamentals in the non-OECD nations will determine the future of the energy transition. EPRINC tested a “net zero” scenario in which all OECD countries approach net zero emissions. Although such an outcome is unlikely, it would have only a modest effect on global greenhouse gas (GHG) emissions. Total reduction in GHG emissions would be limited to approximately 20 percent of total emissions in 2050. Even if such an accomplishment were realized, more than half of global final energy consumption would come from fossil fuels in 2050.

There will be some progress in scaling new and lower carbon fuels and technologies. Some key technologies—electric vehicles, carbon capture and storage, and low-carbon hydrogen—will make important contributions to future energy systems, but these contributions will largely take place in the developed world. Rising energy demand from population and income growth in the developing world will offset the value of the carbon emission limits achieved in the OECD.

In the developing world, fossil fuels will maintain its dominance in final consumption and petroleum will continue to meet growing demand in the transportation sector of emerging economies, while residential and commercial buildings will use more natural gas displacing coal use for heating and cooking. There will be improved efficiencies and progress in limiting GHG emissions and, but the world in 2050 will look much more like 2020 than the aspirational goals set by IEA or the Paris Accords.

Federal and state policies to accelerate the energy transition pose several risks to the United States and her allies in the medium- to long-term. Acceleration of alternative fuels and technologies could substitute U.S. reliance on petroleum as an energy source (a fuel in which the United States is largely self-sufficient) for greater reliance on less secure worldwide supply chains of critical minerals for newer low-carbon technologies. If newer lower carbon emitting technologies are deployed, energy resilience will likely decline rapidly. Electricity generation has not yet fully adapted to the use of large supplies of power from intermittent renewable energy. Only when

we have substantial cost-effective alternatives to fossil fuels will a full-scale energy transition take place. The most important risk facing the U.S. is that we may attempt a policy driven energy transition that brings our energy systems into a number of failure modes that will be both costly (harming economic growth) and harmful to our security.

2. What kind of risks are there for electric power production and to consumers from a rapid increase in the uses of variable and weather dependent energy sources, such as wind and solar?

**RESPONSE:**

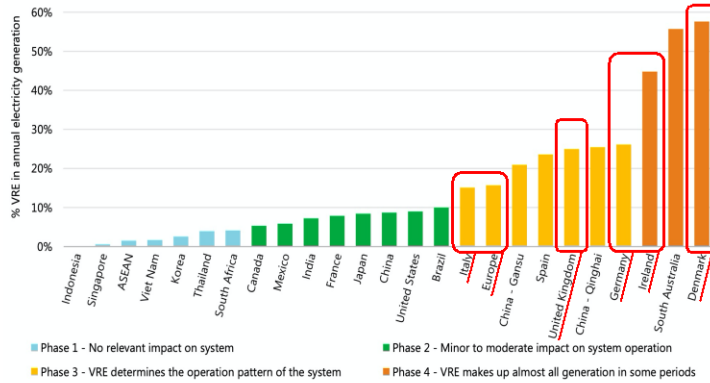
Solar and wind electricity are not dispatchable systems (systems whose generation can be matched to load as load increases or decreases). Therefore, solar and wind generation require dispatchable backup generating systems when there is no wind or sunlight available. And conversely when sunlight and wind are available, there needs to be considerable integration management to maintain frequency. Capital costs for solar and wind begin at \$4,500 and \$1,200 per kilowatt, respectively, with no additional operating fuel costs. Backup systems such as simple natural gas peaker plants range between \$400 and \$800 per kilowatt with operating costs between \$0.04 and \$0.10.

Grids that integrate intermittent sources need to be designed with considerable flexibility in order to balance generation and load, especially as the percentage of solar and wind generation increases. Furthermore, increasing percentages of wind and solar will have exponential, not linear, effects on grid system management. This can only be increasingly costly. Utility-scale battery storage systems can capture solar and wind electricity during periods of low demand, and later dispatch it as needed. While adding one more cost component, this can mitigate some of the higher anticipated integration costs.

Considerable research and planning are still required to ensure that electric power systems are both reliable and cost-effective as they absorb larger volumes of intermittent power. The following chart illustrates the risks as most large systems that have attempted to incorporate large capacities of intermittent have higher costs and lower resilience. California, which has had an aggressive program to incorporate intermittent energy sources into its grids now has the most expensive power costs in the U.S., except for the Hawaiian Islands.

## Recent Events Suggest Greater Renewable Energy Portends Set of Risks

**Annual Renewable energy & IEA defined system integration phase in selected countries**



  Countries experiencing acuity of end user price rise in Autumn 2021

A considerable number of countries with advanced/greater penetration of variable renewable energy appear to have faced greater supply side uncertainties.

A rise in renewable penetration above 70% may be necessary to achieve the mid-century deep decarbonization targets, but raising concerns relating to end user pricing and security of supply.

Source :Ash Shastri, EPRINC, from Secure Energy Transitions in Power Sector: IEA



3. What are the energy security risks to the U.S. from policies designed to limit U.S. fossil fuel production, especially oil and gas, while global demand remains strong?

**RESPONSE:**

Measures to aggressively reduce GHG emissions have also included policy initiatives in the United States and Europe to limit indigenous production of oil and gas to accelerate reductions in GHG emissions. However, if the energy transition is delayed substantially (a likely outcome) such policies would have a direct and harmful effect on U.S. energy security. For example, several initiatives are underway to limit development of oil and gas on public lands and some measures have been proposed to limit development on private lands. The extent to which these initiatives would curtail U.S. oil production, the U.S. would face rising imports of expensive and insecure petroleum. Revenues from leasing on federal lands would decline and these revenues would find their way to foreign producers. There would also be a shift to foreign sources for critical materials essential for alternative energy sources as it is unlikely the U.S. could produce sufficient from indigenous resources. An accelerated transition, imposed by government mandates and subsidies, would move the U.S. from a position of energy independence to reliance on insecure foreign sources of critical minerals and materials. It would also deny the U.S. billions of dollars of revenue from the sale of oil and gas leases on public lands.

4. What kind of price escalation risks to automobile prices will U.S. consumers face from a rapid transition to electric vehicles?

**RESPONSE:**

Electric vehicles (EVs) already are priced about 25% higher compared to their non-electrified counterparts. Much of this is due to the procurement costs of raw materials, and the subsequent processing they require, especially for the batteries. EV battery materials are in short supply. Even with lithium and cobalt production increasing to meet expected demand, there is still a mismatch between production and requirements causing prices for these commodities to rise. As worldwide demand for EVs rise, price escalation is likely to accelerate especially if alternative internal combustion engines are not available for sale.