**Talking Points**

Sophie - The Impact of the IRA on Clean Energy Supply Chains:

- Good morning everyone and thank you so much for taking the time to join us today. We are a group of American University seniors who have spent this semester working on a report for the Bureau of Energy Resources at the State Department about the impacts of the Inflation Reduction Act on clean energy supply chains.
- According to the White House, the IRA contains an estimated $370 billion in new spending designed to ensure the U.S. remains the global leader in clean energy technology, manufacturing, and innovation through a series of tax incentives and investment initiatives designed to boost supply and demand for clean energy in alignment with U.S. national security considerations.
- Through our research, we have compiled a set of policy recommendations for both the bureau and the department at large to consider based upon our analysis of the information and data in our report.
- Before we get into our presentation, however, I would like to introduce my colleagues and fellow group members: *list our names*

Sophie - Report Objectives:

- The objectives of our report were threefold: First, we wanted to explain what the current clean energy supply chains look like in today's geopolitical climate. We mainly focused on wind, solar, and electric vehicles and their batteries. However, we also provided additional information in our report about green hydrogen, liquid natural gas, and nuclear power in the annex.
- We then looked at how the IRA would impact these supply chains in the short and long term.
- Finally, based on these facts and the experts we have consulted, we have set out to make realistic and pract-i-ca-ble policy recommendations.

Sophie - Agenda:

- First, we want to elaborate a bit on what the experts we consulted have stated the stake of the United States government and of course the Department of State is, in ensuring a successful implementation of the law in our foreign policy.
- Then, we will explain some interesting finds in our research regarding solar, wind and EVs, as well as the important information we have found about the IRAs role in reshaping these supply chains.
- Finally, we will go in-depth about our policy recommendations. I would now like to hand it over to my colleague Nate.
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**Nate Laske**

Thank you, Sophie.

- The IRA represents the most significant effort in American history to realign energy sector supply chains with the clean energy transition.
- The passage of the IRA has already prompted strategic shifts among private actors in the clean energy space, as firms mobilize to take advantage of provisions within the legislation.
- However, the IRA has been criticized for its use of domestic production and free trade provisions by partner countries in Europe and Asia
- In recent decades, United States mining, mineral processing, and manufacturing have been in decline, partially due to increasing competition from China. For example, between 2000 and 2010, one-third of all U.S. manufacturing jobs were lost as the industry adopted new technologies that require fewer workers.
- The passage of the Infrastructure Investment and Jobs Act, the CHIPS and Science Act, and the Inflation Reduction Act represent a combined 2 trillion dollar investment into American R&D, manufacturing, and infrastructure.
- This constitutes the largest slate of industrial policy implemented by the U.S. aimed at restoring the socioeconomic benefits of a vibrant, competitive industrial base; in line with the geopolitical, environmental, and economic realities of the future.
- Concerns over China's dominance in the critical mineral sector sparked the March 2022 Invocation of the Defense Production Act from the Biden Administration, directed the DoD to strengthen the U.S. industrial base for large-capacity batteries used in the automotive, e-mobility, and stationary storage sectors.
- Since a significant amount of American defense and clean energy technologies depend on the importation of minerals from China, this dependence poses a risk to U.S. national security, given that China has a record of ceasing trade in response to political disagreements, as they did to Japan in 2010.

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- The IRA is designed to boost both domestic and international Clean Energy Production.
- It provides funding to various government agencies to support the clean energy transition, supports domestic clean technology manufacturing and adoption

through a series of tax credits and incentives. The IRA also makes a commitment to pursuing environmental and social justice at home and abroad, while strengthening the U.S. geostrategic position in the energy sector.

- To accomplish these objectives, the IRA includes various Investment Tax Credits geared towards mobilizing private sector investment into large-scale clean energy projects like wind turbines, which tend to be more capital-intensive up-front. This compares to the more long-term oriented Production Tax Credits, which distribute tax benefits based on production of certain eligible components.
- For example, the IRA's Advanced Manufacturing Production Credit incentives the production of certain components used in solar, wind, and battery technology.
- Other tax incentives, like the Plug-In Electric Motor Vehicle Credit, can only apply to vehicles that meet certain requirements with respect to minerals and battery components, and will become unavailable at the end of this year for vehicles with battery components manufactured by "foreign entities of concern." These are defined as entities that are owned by, controlled by, or subject to the jurisdiction of the countries of China, Russia, North Korea and Iran.
- To qualify for certain credits, the final assembly of electric vehicles must occur in North America, OR, in a country that has a Free Trade Agreement (FTA) signed with the U.S.
- According to the most recent Treasury Department Guidance issued in April, less ambitious agreements—like the critical mineral partnership signed with Japan—will also qualify as FTAs, meaning that Japanese components used in the production of EVs, solar panels, and wind turbines can still qualify for tax benefits.
- Finally, the IRA builds on the Biden Administration's Justice40 Initiative, a commitment to direct 40% of the overall benefits of climate and clean energy investments to disadvantaged communities through specific provisions outlined in the legislation.
- The IRA lends legitimacy to the United States in international fora that it is willing to take the lead on matters related to climate change—a global challenge that will only increase in importance in decades to come.

Now, I would like to reintroduce my colleague, Sophie, to continue with the next section.

Sophie - President Biden Quote:
Here is a quote from the President himself on what he says to be the purpose and main goals of the IRA. As you can see, the administration is promoting the investment into clean energy technologies with an emphasis on directing these supply chains through the United States, especially in the manufacturing stage. I would now like to hand it over to my colleague David to discuss clean tech supply chains.

David - Slides 7-17

Thank you Sophie,

- The IRA affects hundreds of clean technologies. However, because of their importance in the clean energy transition, and because these technologies are indicative of geopolitical challenges in clean energy supply chains, we chose to focus our analysis on the supply chains of Solar Photovoltaics, Wind Turbines, and Lithium-ion batteries in EVs.

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- According to the DOE Solar Futures Study, Solar PVs may provide 40% of domestic electricity, up from 3% currently.
- Two types of PVs, Crystalline Silicon modules, make up a large majority of the solar panel market and are primarily produced in China, with Cadmium Telluride modules making up most of the rest
- To deploy Solar at scale, production of certain minerals will have to rapidly increase even if innovation reduces mineral intensity.
- According to the IEA, polysilicon is a bottleneck in c-Si production even though silica is plentiful across the world because of manufacturing constraints due to growing demand. One of the reasons solar experts expect 2023 to be a better year for solar is due to falling polysilicon prices.

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- The U.S., and the rest of the world, are overly reliant on China. The country produces 80% of components in the solar supply chain.
- As the data from Energy's Winter 2023 Quarterly Solar Industry Update indicates, the U.S. imports cells and
  **(Space)**
  modules from other Asian producers to make up for America's small but growing solar manufacturing sector. However, as current disputes over the implementation of AD/CVDs on Southeast Asian countries indicate, the U.S. is not able to escape China's reach in the c-Si solar sector
- The exception to these trends are in CdTe PVs. First Solar, a U.S. company, is the largest CdTe producer in the world. It is expanding domestic and international production of which some is sent back to the U.S. However, constraints in Tellurium, a key critical mineral that is rarer than gold and rare earth elements, is an industry bottleneck.

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- Wind, similar to solar, may supply up to 35% of America's electricity by 2035 according to the DoE. Wind Turbines are generally installed on land. However, to take advantage of faster wind speeds and proximity to key markets, some wind turbines are being built offshore.
- This supply chain flowchart, like the one for solar PVs and Lithium ion batteries, are not completely accurate, but broadly demonstrate the huge amount of inputs and relationships that exist in clean energy supply chains.

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- Compared to Solar and EV supply chains, many components in the Wind Turbine supply chain are produced in the U.S. According to projections by the Global Wind Energy Council, the U.S. will slightly decrease but maintain its presence in the global wind energy market, while China and, somewhat distantly, the EU, will also maintain their place as the 1st and 2nd largest wind turbine producers.
- The biggest obstacles in terms of foreign reliance for the U.S. is in advanced wind technology components such as direct drives which utilize high amounts of rare earth elements, which are almost exclusively produced in China. This will particularly stunt U.S. offshore deployment which exclusively use rare earth elements in their drivetrains. **(Space)**

  However, most wind turbine components are imported from a variety of countries.
- Another obstacle in offshore wind is a lack of Jones Act-compliant Wind Turbine Installation Vehicles. The U.S. will have its first one later this year.

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- Lithium-ion batteries are the most common short term energy storage device and EV battery. Other technologies may improve efficiency and reduce mineral use, but according to experts we talked to they do not have the infrastructure to significantly affect the supply chain in the short-term.
- However, investment in cathode composition is changing the amount and type of critical minerals used in batteries. The market is shifting to high-nickel and iron phosphate cathodes that use less cobalt partially due to cobalt's association with human rights abuse in the Congo.

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- As demonstrated by USGS data visualized in this graph, the five most important minerals in EV batteries are found in a few countries, making the supply chain vulnerable to supply shocks. With the exception of graphite, China does not mine most of these materials.

  **(Space)**

Instead, it acts as the global refiner of these minerals. Combined with high production of EV batteries, China has captured much of the Lithium-ion EV battery market share. Two thirds of America's lithium-ion battery imports come from China.

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- According to the literature, basically all clean technologies will be impacted by IRA grants, loans, and tax credits. Clean energy tax credits will incentivize deployment and advanced manufacturing tax credits will incentivize the manufacture of clean energy components and critical minerals mining and refining. Consumer ITCs will make it easier for Americans to install solar panels in their homes and buy EVs.
- An interesting element of the IRA is that it includes less bureaucracy for the advanced manufacturing ITC and PTC by not including any bonus credits except labor standards for the ITC. This might mean that IRA tax credits may be easiest to disburse in the clean tech manufacturing sector. Combined with direct pay and transferable tax credit provisions, the IRA drafters clearly tried to make tax credits accessible and target specific goals.

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- Predictions that the IRA will "uplift" America's cleantech sector have come true, at least in the short term. Data from the Bank of America Global Research Team and American Clean Power show that there has been sizable investment in Solar PV, EV battery, and Wind Turbine facilities. These investments will help support America's nascent offshore wind sector against more mature EU and Chinese offshore wind turbines and help build out a North American EV battery supply chain. However, issues persist. Macroeconomic conditions and shifting legislation and policy may prevent America from unlocking its full clean energy potential.
- In particular, as a product of partisan dealmaking, parts or all of the IRA remains under existential threat due to partisan lawmakers. Recently, Republican legislation to reduce IRA tax credits harms the law's potential. This may spook investors by raising the risk that IRA tax credits may not be available, undercutting the value of their potential investments. In conclusion, the IRA acts as a tailwind for climate investment but faces potential legislative and economic headwinds.

My colleague Margaret will explain the impact of the IRA in greater detail

Impacts: Margaret

- Next I will be talking about the impacts of the IRA as seen in the reactions of foreign nations and how experts see the IRA developing in the future.

Slide International Responses: (Margaret)

- Many nations have responded to the US passage of the IRA. Today I am going to highlight the reactions of the EU, Japan, and China.
- First I will be talking about the EU. We discussed with several experts the reaction of the EU to the passage of the IRA. They emphasized the EU's initial negative reaction due to concerns this would lead to exclusion of EU companies from the US market and said the reaction slowly changed into a more positive perception of the IRA. Though the breadth of opinions in the EU on this topic is still diverse. Experts said one reason for this was the establishment of the EU-U.S. IRA Task Force which has already resulted in a potential agreement regarding electric vehicle subsidies.
- Particularly emphasized by experts was the impetus provided by the passage of the IRA for the EU to consider the passage of a similar law. As you know the Green Industrial Plan has already gone through the European Commision and is waiting on approval by the member states. Experts we talked to stated that before the IRA was passed even the consideration of passing legislation that would subsidize green energy private business was unthinkable.

Japan

- As Nate mentioned previously Japan and the US have signed the Agreement on Strengthening Electric Vehicle Battery Critical Minerals Supply Chains which increased integration between the two countries' green energy supply chains.

China

- Unlike many nations, China has been relatively silent on this topic other than some minor comments about the possible WTO violations.
- Experts we spoke to emphasize that this is because China doesn't have to care. China has an extremely large domestic market for green energy technologies. Additionally, due to the strained relationship between the US and China, more Chinese companies focus more on exporting to other parts of the world. Interestingly, Anders Hove at the Oxford Institute for Energy Studies, said that China would care more if the EU passed an IRA equivalent because of their efforts to export green technologies like solar panels and EV's there.
- The only possible reaction of China to the IRA mentioned by experts we spoke to is the Chinese Ministry of Commerce's proposed ban on the export of solar PV wafer preparation technology.
- However, experts and news articles describe the Chinese private sector being far more receptive to the IRA with Chinese companies making efforts to take advantage of the tax

credits. Several Chinese companies, including JA Solar and Longi Green Energy Technology, have announced plans to build factories in the US and or Mexico.

Slide Future of Clean Energy Supply Chains: (Margaret)

- During our discussion with experts they highlighted several factors that they believe will result due to the passing of the IRA.
- They include 1)a clean technology investment boom which, the currently announced projects have already brought in billions of dollars worth of investment to the US,
- 2) the positioning of the US as leader in the green energy transition because of the promotion of Global Clean Technology Industrial Policy included in the IRA, and
- 3) De-risking of supply chain and a degree of decoupling in some geostrategic supply chains because of the domestic content requirements as well as provisions prohibiting sourcing from foreign actors of concern.
- However experts also underlined several essential conditions that must continue or be implemented to ensure that the IRA reaches its full potential. While the full list of determinants can be found in our report I would like to highlight the need for continued investor confidence in tax credits and the IRA as a whole because of the time it takes to build plants and factories. Without this confidence new project announcements will slow. Experts stated that one threat to this is the political controversy surrounding the IRA. Additionally, there is a need for continued innovation and breakthroughs in clean technologies in order to allow for supply chains to move away from actors of concern.

Introduce colleague Sean

Recommendations: Sean
Next, we have compiled a list of policy recommendations based on what my colleagues have explained thus far. Next slide please.

MSP Focus/Expansion: Sean

The Mineral Security Partnership is a critical tool for U.S. foreign and international economic policy. We have determined that the Mineral Security Partnership is the strongest route to create resistant clean energy supply chains with high labor standards and practices. These sorts of requirements could create a culture within the MSP based on certain principles such as democracy, sovereignty, economic prosperity, ethical mining and sourcing. Many of the experts we spoke to emphasized these points, which are crucial things to establish if the United States wants to differentiate itself from China in this market. Another thing we recommend is the MSP's expansion to as many nations that fit these criteria and accept the agreed principles. This is to ensure a large supply and to ensure that countries that discover new mineral deposits will be more likely to be in the partnership, obligating them to trade this new supply with a US-led bloc of partner nations of shared values. Ultimately, the partnership could be an important tool in taking away economic opportunity in this sector from countries of national security concern. To continue, I would like to invite David to speak more about how to better set the foundation of the MSP.

Joint critical minerals: David

- In conjunction with an MSP joint strategy, which I speculate is being drafted right now, and a joint critical minerals strategy, the MSP can increase its effectiveness by creating a joint list of critical minerals. No country in the MSP has a common list of critical minerals, so our report offers strategies to create a joint list.
- Critical minerals should be considered critical based on the needs of the "average" members in the bloc to avoid distorted selections. We list a set of heuristics here, and each mineral should pass them to be "deemed" critical. Drafting such a list would help clarify which priorities MSP initiatives should meet first.

Nathan will now continue with our recommendations

Battery Standards: Nathan

- One way to increase the effectiveness of the Mineral Security Partnership is through Battery Passports.
- After researching the Global Battery Alliance's proposed passport criteria and speaking to experts, we found that a potential Battery passport program could use the MSP as a parent organization to be implemented.
- The general goal of a potential BP program would be to slowly diversify the supply chains away from China as more EV and battery manufacturers would be barred from purchasing minerals mined and processed outside of the norms set by the MSP.
- The largest hurdle of a potential program would be convincing not only our allies and partners but mineral-countries companies to sign on over time.
- As I am sure you can all infer, there would be massive security benefits to being in a US-led MSP. If this program was implemented successfully, experts believe it could secure supply chains that would provide constant access to necessary minerals and build consumer support for EV battery standards.
- The economic incentive of an MSP Passport is more complicated and less obvious. For producers such as Zambia and the Democratic Republic of the Congo, western investment is a way for them to diversify their export base and add bargaining chips when dealing with China.
- In our interviews, experts suggested that as an economic incentive, All countries signed on would have exclusive access to a growing number of partner nations, personnel, and resources which would offer an increasing amount of attractive economic incentives. Members of the MSP Passport could receive access to new facilities, exclusive deals with regional and global development banks, strategy teams, deal-making teams, and shared strategic mineral stockpiles.
- Like the Kimberly Process, experts hope that consumers would support the idea for the human rights benefits, even if it means occasionally paying more. Public diplomacy campaigns can help demonstrate to consumers the positive benefit of the supply chain, as we saw with the Uyghur Forced Labor Prevention Act.
- Another sentiment we incurred often is that Any MSP Passport system would be extremely complex and take years, if not decades, to implement. However, the benefit to the U.S., its allies, and the laborers involved in the supply chain are invaluable. If properly developed, the system would secure the future of the supply chains that will exponentially grow as IRA and other green energy funding continues to increase.
- I would like to pass the floor over to Nate to go deeper into the aforementioned Public Diplomacy Campaign…

**Nate Laske**

- MSP member states should commit to establishing and maintaining a joint Public Diplomacy Campaign to communicate significant project milestones and overall institutional objectives. To accomplish this goal, the MSP should:
- Interface with the public through expanding MSP online presence:
    - The establishment of a formal MSP website and MSP social media channels modeled after other multilateral organizations, like NATO, would expand the reach of the MSP to domestic and foreign publics, as well as increase private sector interest in its initiatives.
- Finally, the MSP should engage with the media to bring critical mineral issues to the forefront of the public consciousness, by establishing itself as an internationally-recognized authority on policy pertaining to critical minerals. Journalists should have the ability to easily contact the Mineral Security Partnership for comment on stories related to critical mineral supply chains.

The MSP should establish a permanently-staffed secretariat to manage internal and external affairs. We recognize it will be a challenge to coordinate such an effort between multiple member states, but strongly believe that such an effort would increase the efficacy of the MSP.

I would like to reintroduce my colleague Nathan for the next section

Private Sector Investment: Nathan

- The United States will need 6x the amount of critical minerals as it currently imports and/or produces to maintain net-zero by 2050 goals. Right now, there are two key minerals along with REEs that the U.S. is at risk of losing supply.
    - Lithium, while plentiful, will not meet the estimated future demand
    - Cobalt: While rare, the second largest source is in Australia, so experts have told us it will not be the forefront issue
- While the US has limited ability to finance sourcing projects and processing facilities directly, the US can demonstrate to other governments:
    - The long-term benefits of creating a new, broad, and stable supply chain for its global partners,
    - It can also take policy action to secure and strengthen the critical supply lines that remain a national security issue.
- We received many opinions and suggestions from experts on how to increase US investment in sourcing. Still, one common note was that, to some extent, mining companies need to assume some risk. To put it simply, it's the name of the game.
- The second common theme to our conversation with experts is the expansion of the Mineral Security Partnership can support private investment into green supply chains through vibrant public-private partnerships and facilitation of dialogue between agencies, development stakeholders, and the private sector.
- I would now like to reintroduce Sean to talk about our other recommendations outside of the MSP.

Free Trade and New Agreements: Sean

The free trade agreements that have been mentioned, as you all well know, are not the traditional all encompassing ones. Rather, the United States should focus on forging new agreements that qualify under the IRA for tax credits and incentives. The recent Japan-US agreement is a great model for other nations going forward, which surely the State Department is working tirelessly to pursue. However, from our research and conversations with experts, we believe that this course is an effective and realistic plan of action for the state department to continue to implement. We also recognize the importance of public-private partnerships. The implementation of the IRA in foreign policy requires this sort of cooperation between governments and firms, which will be crucial for mining, processing, and various stages of manufacturing these clean energy technologies.

Although there were many concerns of how the IRA would impact relationships around the world, experts have told us that the law has put the United States in a favorable negotiation position, which is why we also believe that this is a good policy route to continue.

It is also interesting to note the developments in Indonesia, where experts believe a coming surplus of refined nickel is supposed to flood the market. The United States and the State Department should continue to keep their eye on similar developments in order to pursue new partnerships and agreements for these critical minerals. Next, David will talk about our recommendation regarding negotiation teams and their roles in forging clean energy projects.

Plurilateral negotiation teams : David

- Building off an improved interagency process for promoting clean technologies, through the MSP, bilateral negotiation, or other partnerships such as the Energy Resources Governance Initiative, the U.S. should form bi, pluri, or multilateral “negotiation” teams with foreign and/or domestic agencies.
- These teams should work together to create a more business-friendly environment for companies to invest and operate critical mineral mines and refineries with high ESG standards
- Teams can offer a variety of sweeteners to resource-rich local and national governments to create such an environment.
- For example, these teams, through one agency or another, can offer development assistance. Investing in local renewable electricity generation, for example, could help electrify impoverished regions and be used to build out mineral refineries.
- An investment framework can make it easier for mining companies to do business in resource-rich countries, helping de-risk critical mineral investments.
- This coordination may be hard to reach initially, but if made can allow each agency to use their comparative advantage in a certain field to improve the critical minerals investment environment.

Back to you, Sean

Clean Tech Supply Chain Education Module: Sean

Another issue we have identified on this overall topic is the issue of education. We have noticed that the foreign service institute currently does not offer a course about critical minerals and clean tech supply chains, but believe it would add value to those working in the state department and other government agencies. It could provide accurate information regarding the international movement and trade of critical minerals, components for clean tech, and the finished products. It is also a course that would be offered in a variety of formats, online, hybrid, or in person. We believe the added value of such a course would be crucial for the state department, especially if the clean energy transition is to become a long-term foreign policy pillar.

Finally, the implementation of business fora would be a great way to foster investment. This would include sending US delegations of US agencies and private firms to discuss potential private-public partnerships, as mentioned previously. It can also be a stage on which to support private firms and their foreign investments. Agencies could invite domestic and foreign firms like mining and refining companies, clean technology manufacturers, clean energy distributors, as well as political officials in capital and resource-rich states interested in receiving greater investment. Stakeholders could share new research, enhance networks, and interface with U.S. bureaucrats involved in the clean energy space through State Department backed fora.

Supply chain interventions: where do we need to focus most closely on in terms of bottlenecks