

**Testimony by  
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Hearing on The Important Role of U.S. LNG in Evolving Global Markets**

Chairman Murkowski, Ranking Member Manchin and members of the committee, thank you for the opportunity to testify before you regarding the evolving and exciting global gas market and the important role for U.S. LNG exports. Sempra Energy has been in the natural gas business for over 150 years and a leader in LNG for more than 15 years, so I am happy to be able to share our experience and outlook with you today. My name is Dennis Arriola and I am the Executive Vice President and Group President for Sempra Energy.

Sempra Energy is a Fortune 500 energy infrastructure company based in San Diego, California with revenues of more than \$11.6 Billion in 2018. We're the largest utility holding company in the U.S., serving more Americans their basic energy needs every day. With approximately 20,000 employees, Sempra serves more than 40 million customers worldwide. Our vision is to deliver energy with purpose, and our mission is to be North America's premier energy infrastructure company. Our company stands squarely at the intersection of two global trends: the trend toward cleaner energy, and the trend toward the U.S. as a dominant world energy supplier.

Our operating companies include Southern California Gas Company (SoCalGas), the largest natural gas distribution company in the U.S.; San Diego Gas & Electric (SDG&E) in

Southern California; Oncor Electric Delivery Company (Oncor) in Texas; and two electric utilities in South America.

Additionally, our businesses include Sempra LNG and IEnova, which was one of the first private companies to invest in the energy sector in Mexico following the reforms that opened the market for energy infrastructure development. Our IEnova assets provide some of the vital infrastructure necessary to support American natural gas producers in exporting U.S. natural gas to Mexico. Today, Mexico is the largest buyer of U.S. natural gas in the world and 67% of U.S. natural gas exports flow to Mexico, according to the U.S. Energy Information Administration (EIA).

Sempra Energy is a leader in North America's growing LNG export market, developing the infrastructure to bring cleaner, more reliable and more affordable energy to the world. We are pursuing five strategically located LNG opportunities in North America, with a goal of delivering 45 million tonnes per annum (mtpa) of clean natural gas to the largest world markets, and the ability to dispatch LNG into both the Atlantic and Pacific basins. Those projects include: Cameron LNG Phase 1, which began producing LNG in May; Cameron LNG Phase 2; Port Arthur LNG in Texas; and Energía Costa Azul LNG Phase 1 and Phase 2 in Mexico. We expect that Sempra's LNG projects have the potential to fuel the equivalent of the world's fifth largest economy, opening new markets to American producers and facilitating long-term demand for abundant, clean American natural gas.

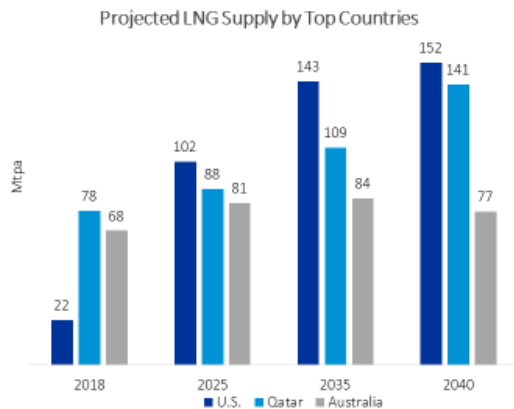
Sempra's experience as a developer and operator of LNG import and export facilities has provided us with a keen perspective on the global market for LNG. That perspective and the opportunities we see ahead in the LNG export market for the U.S., will be the focus of my

testimony today. I'll touch on U.S. supply, the impact to our economy, the global market, how LNG exports help reduce our trade deficits, the geopolitical benefits to the U.S. and our allies, and last but not least, the environmental benefits of LNG.

### **U.S. Natural Gas Supply**

In 2017, the U.S. became a net exporter of natural gas for the first time since 1957. Thanks to American ingenuity and technology advances, the shale gas revolution, the transition to cleaner energy resources, and pro-energy policies and legislation, natural gas supply is expected to increase to 90 billion cubic feet per day (bcf/d) in 2020, which is a 30% increase from 2017. Most of the increased natural gas is what's known as associated gas and directly related to the production of crude oil. As a result, the associated gas is an extra benefit to producers while they focus on the more valuable oil. If there is available infrastructure, the associated gas can either be processed and transferred into pipelines and used domestically or exported as LNG. The abundance of natural gas is great for domestic consumers as it means lower prices, and a welcome relief to international customers as they now have a strong, reliable and affordable supplier in the U.S. that can help countries meet their growing energy needs. The U.S. accounts for 22% of global gas production and is on track to be the largest exporter of LNG in the world by 2024. Qatar is today the largest LNG supplier globally (over 75 mtpa), although the U.S. is expected to outpace it by 14 mtpa by 2025.

## U.S. Expected to be the LNG Supply Leader<sup>1]</sup>



- Global LNG supply is currently spread across 19 countries
- Current largest supplier is Qatar with over 75 Mtpa of supply
- North America is the leader in new expected LNG supply with ~100 Mtpa of proposed capacity additions
- By 2023, the U.S. is expected to be the world leader of LNG supply
- By 2025, the U.S. is projected to outpace the second largest LNG supplier by 14 Mtpa

*Due to growing supply and advantaged pricing, the U.S. is projected to be the world leader in LNG exports by the mid-2020s with over 100 Mtpa of projected LNG supply*

1] Source: Wood Mackenzie Global Gas Markets Long-Term Outlook 2018: LNG Supply January 2019

### Increased LNG Exports Benefit the U.S. Economy

Becoming the world's leader in natural gas production and LNG exports will have a strong positive impact on the U.S. economy. Increased domestic natural gas production has the potential to add millions of jobs to the U.S. economy and help the global energy economy. We've already witnessed some of the economic benefits at our LNG facility in Louisiana.

On May 14, 2019, we produced our first LNG at our Cameron facility in Hackberry, Louisiana. We had the honor of being joined not only by the President of the United States and diplomats from the European Union and Japan, but also by some of your colleagues here today, including Senator Cassidy. This event truly had a global impact. Then, on May 31<sup>st</sup>, the first LNG tanker departed Cameron loaded with LNG produced at our facility, bringing American natural gas to the world market. It was a very proud and exciting day for Sempra, our partners and our country.

The total economic impact in the U.S. from Cameron LNG is estimated to be \$336 billion over the life of the project. The project is expected to generate an average of 53,000 direct and indirect jobs annually during the 20-year operations period, resulting in a total impact during the periods of construction and operation of 1.1 million job-years.

Over 11,000 highly skilled workers contributed to the construction of Cameron, including welders, iron workers, insulators, electricians, construction workers, logistics professionals and other important vocations.

And that's just one of our LNG export infrastructure facilities. Our consultant, ICF International, estimates the economic impact in the U.S. from our LNG export project in Port Arthur, Texas will be \$287 billion, or slightly over \$11 billion annually, over 25 years. Additionally, we anticipate that the Port Arthur LNG Project will help facilitate an average of nearly 5,700 direct and indirect jobs in Texas and 41,000 nationally through 2043, resulting in a cumulative impact of over 143,000 job-years for the state of Texas and one million job-years for the U.S. economy.

### **Servicing Global LNG Demand**

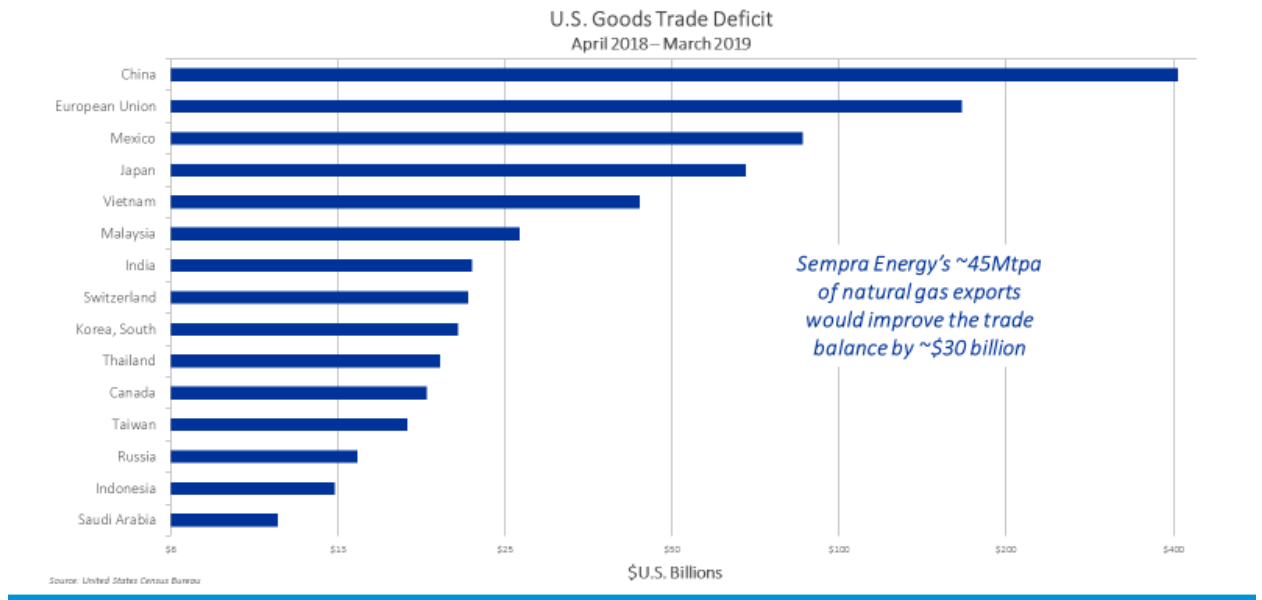
Asia today accounts for 70-75% of global LNG demand and Europe approximately 15%. Most experts agree that demand for natural gas, especially LNG, will continue to grow globally due to increased energy needs and the transition to cleaner fuels for electric generation. Forecasts expect the largest increases in LNG demand to come from China, India, South Korea, Japan, and Pakistan. In Europe, we're seeing several countries including Germany, Croatia and

Greece build new import terminals so that they can access different natural gas supplies and not be overly reliant on Russian gas through pipelines.

The majority of U.S. export capacity either exists today or is being developed in the Gulf Coast region where terminals have access to existing pipelines and storage infrastructure. On average, it takes an LNG vessel approximately 21 days to travel from the Gulf Coast to Asian markets as the ships need to go through the Panama Canal. Sempra Energy is in the process of developing two projects at our import facility at Energia Costa Azul, or ECA, which is less than 90 miles south of San Diego on the west coast of Mexico on the Pacific Ocean. When our two projects in Baja California are completed, they will connect with pipelines from Texas to help form the “Permian to Pacific” highway and will help reduce the time it takes for U.S. natural gas to get to Asian markets to approximately 12 days. As a result, Asian LNG buyers will have increased optionality with the ability to access multiple gas producing regions, with different pricing mechanisms. This will help the U.S. be even more competitive in the global LNG market.

### **Increased LNG Exports Will Help Reduce the U.S. Trade Deficit**

The growth of U.S. LNG exports has the potential to improve our balance of trade and strengthen U.S. foreign policy. The Commerce Department recently reported that the deficit between the goods and services the U.S. sells versus what we purchase from foreign countries rose 8.4% to \$55.5 billion in May. Exports increased 2% to \$210.6 billion, but imports climbed even higher — 3.3% to \$266.2 billion. The deficit with China rose 12.2% to \$30.2 billion.



An increase in LNG exports could make a significant improvement in the U.S. trade balance, especially with countries that import large quantities of LNG and have substantial trade surpluses with the U.S., such as Japan, South Korea, Taiwan and China. The 45 mtpa of natural gas exports from Sempra’s five planned LNG export facilities alone would improve the U.S. trade balance by approximately \$30 Billion.

Since ten countries in Asia account for over 80% of our trade deficit, selling them LNG could be a win-win outcome. Exporting LNG to China alone could be a game changer for our trade deficit. China became the world’s largest importer of natural gas in 2018. As part of the Communist Party’s Blue Skies policies to address air pollution, China will need to increase its purchases of foreign sourced natural gas. Why not from the U.S.?

Exports from Cameron LNG and Port Arthur LNG could help reduce the overall U.S. trade deficit by roughly \$16 billion annually and generate a combined cumulative value of

approximately \$303 to \$402 billion over the life of these projects. These and other U.S. export facilities will promote new pipelines and maintain natural gas production in the many producing states (e.g., Ohio, Pennsylvania, New Mexico, North Dakota, Texas and Louisiana); and at levels that will continue the current cost advantage that benefits U.S. consumers.

The U.S. has experienced positive trade benefits already from energy exports to Mexico over the last several years. In 2018, according to the EIA, the U.S. had net exports of petroleum related products (much of it natural gas) of approximately \$14.7 billion, helping to reduce our trade deficits with Mexico. As other foreign countries look for ways to competitively source LNG in the global markets, they will look to the U.S. markets.

### **Increased LNG Exports Will Allow the U.S. to Build Stronger International Relationships**

In addition to the trade deficit, the U.S. can also use our abundant natural gas resources to further strengthen our relationships with foreign governments. LNG exports can help improve those relationships by providing competitive options to Russian gas and help us create new allies. Energy demand in Asia is expected to grow rapidly through 2040, while as we have discussed, the U.S. is expected to be a net energy exporter. In September and October of 2018, China was importing more than 12 bcf/d. In Europe, the need for natural gas is also rising, while internal production in Europe is faltering. And, Europe already has import facilities with plenty of room to increase their import capacity.

Sempra Energy is answering the call for LNG demand worldwide and helping to enrich the reputation of the U.S. along the way. For example, Sempra has signed a 20-year definitive agreement with Polish Oil & Gas (PGNiG) for 2 million mtpa of LNG, approximately 20% of Port



Arthur's planned export capacity, and preliminary agreements with major natural gas companies in other countries in Europe and Asia, including: Total, Mitsui & Co., Tokyo Gas and Kogas.

Furthermore, these agreements to offtake LNG from Sempra projects and other U.S. LNG export facilities are providing options to Russian gas in supplying LNG to Europe. These countries know that they can rely on the United States as a fair trading partner for reliable, long term energy security. As more U.S. export capacity comes on line and additional import capacity is developed, U.S. natural gas markets will continue to grow and evolve.

### **Growth in LNG Exports is a Net Positive for the Environment**

The U.S. has an opportunity to lead a global transition to cleaner energy. LNG exports can help countries improve air quality and the environment by displacing less clean resources. More than half the countries in Asia have air quality concerns, so the demand is there for cleaner, more affordable natural gas.

The trend in the U.S. and abroad is to phase-out coal-fired power in favor of renewables and natural gas. A total of 39.64 gigawatts (GW) of coal power capacity – 21% of Europe's currently operational coal fleet – is located in countries which have committed to phase out coal. For example, Germany recently announced the phase-out of all coal-fired power plants by 2038. These countries are looking for alternatives to coal and oil and they are turning to natural gas because of the comparatively low cost and environmental benefits. While no source is perfect, natural gas emits less carbon dioxide (CO<sub>2</sub>) than alternatives – half that of coal – it also

emits far less nitrous oxide (NO<sub>x</sub>), and virtually none of the other harmful emitted pollutants: sulfur dioxide (SO<sub>2</sub>), mercury, or particulates.

When the transition to natural gas is implemented in Asia and Europe, the environmental benefits will be tremendous. Many of these countries are not meeting their climate pledges under the Paris Agreement and need U.S. LNG to achieve their climate goals.

For consumers in many Asian countries, dung and coal are still the primary source of energy for heating and indoor cooking in homes. Getting access to clean burning natural gas will improve their quality of life, their health, and provide them with energy justice that many first world countries take for granted.

The growth in LNG globally will also complement the growth of renewable sources of electric generation in foreign countries. Natural gas-fired electric generation is key to providing reliable and cost-effective baseload energy. As we've seen in the U.S., when the wind doesn't blow and the sun doesn't shine, it's important to have another clean and reliable source of energy. We can also expect natural gas to continue to make inroads in transportation markets globally. As has happened in most major cities in the U.S., the availability of LNG and natural gas will allow municipalities and fleet operators to displace diesel fuel and gasoline with a cleaner and low cost fuel. This is a positive for the environment and will help improve air quality in smog-choked cities around the world.

## **Conclusion**

The U.S. is well positioned to be the global leader in energy exports. LNG exports provide a path to a cleaner environment worldwide, a reduction in our trade deficit with other

countries, an opportunity to build stronger international relationships, all while creating jobs in the U.S. and improving our domestic economy. Sempra is making significant investments in LNG export infrastructure to help realize our full potential as a country.

Thank you for the opportunity to appear before the committee today. I look forward to your questions.