THE IMPACTS AND FUTURE OF NORTH AMERICAN ENERGY TRADE

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY

OF THE

COMMITTEE ON ENERGY AND COMMERCE

HOUSE OF REPRESENTATIVES

ONE HUNDRED FIFTEENTH CONGRESS

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C O N T E N T S

WITNESSES

THE IMPACTS AND FUTURE OF NORTH AMERICAN ENERGY TRADE

WEDNESDAY, DECEMBER 13, 2017

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:17 a.m., in room 2322, Rayburn House Office Building, Hon. Fred Upton (chairman of the subcommittee) presiding.

Members present: Representatives Upton, Olson, Barton, Shimkus, Latta, McKinley, Kinzinger, Griffith, Johnson, Flores, Mullin, Cramer, Walberg, Duncan, Rush, McNerney, Peters, Green, Welch, Tonko, Loebsack, and Pallone (ex officio).

Staff present: Samantha Bopp, Staff Assistant; Allie Bury, Legislative Clerk, Energy/Environment; Wyatt Ellertson, Professional Staff Member, Energy/Environment; A.T. Johnston, Senior Policy Advisor, Energy; Ben Lieberman, Senior Counsel, Energy; Mary Martin, Chief Counsel, Energy/Environment; Brandon Mooney, Deputy Chief Counsel, Energy; Mark Ratner, Policy Coordinator; Annelise Rickert, Counsel, Energy; Dan Schneider, Press Secretary; Peter Spencer, Senior Professional Staff Member, Energy; Jason Stanek, Senior Counsel, Energy; Madeline Vey, Policy Coordinator, Digital Commerce and Consumer Protection; Priscilla Barbour, Minority Energy Fellow; Jeff Carroll, Minority Staff Director; Rick Kessler, Minority Senior Advisor and Staff Director, Energy and Environment; John Marshall, Minority Policy Coordinator; Alexander Ratner, Minority Policy Analyst; Tuley Wright, Minority Energy and Environment Policy Advisor; and C.J. Young, Minority Press Secretary.

OPENING STATEMENT OF HON. FRED UPTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MICHIGAN

Mr. UPTON. Good morning. Good morning, everybody, and welcome to everyone that's here. Appreciate you all taking time so close to the holiday season to be with us today. That's for certain. This hearing builds upon the Energy and Commerce Committee's impressive record of hearings on energy security, job creation, and infrastructure.

One of the many things that I appreciate about this subcommittee is that we have members who represent both northern and southern border States.

As a proud Michigander, I will be focusing my comments and questions more on our relationship with Canada, while I am sure

my friends from Texas—it was a nice win by Michigan over Texas in basketball last night—will be focusing more on Mexico.

But one thing I want to make clear, this hearing is about North American integration, specifically the impacts and future of North American energy trade.

We want to examine how North American energy trade has strengthened all of our economies and our trading relationships.

Nationally, 14 million jobs are tied to trade with Mexico and Canada. In Michigan, it is nearly 400,000. This trade makes us more competitive internationally and can prove to be the difference between creating or shedding jobs.

Eighty-four percent of petroleum and coal products exported from Michigan go either to Mexico or Canada. The energy markets of Canada, Mexico, and the U.S. are becoming increasingly interdependent, thanks in large part to the free trade status of energy commodities.

When we think about energy trade, we are including crude oil, refined petroleum products and other liquids, natural gas, and electricity.

To sum it up, we have transmission lines that go across the border, we have got pipelines that go across or under the border, and we have goods and services that go across the border, as well.

Energy trade is much more than just commodities. There is also a huge supply chain supporting everything. The multiplier effect of energy trade is great throughout our economy.

Trilateral engagement is not just about trade, but also about information sharing. Just last month, the Energy Information Administration announced the launch of a website on North American Cooperation on Energy Information, or NACEI.

This resource consolidates energy-related data, maps, references from the U.S., Canada, and Mexico. The current areas of focus include comparing, validating, and improving respective energy import and export information, sharing publicly available geospatial information related to energy infrastructure, and exchanging views and information on protection of cross-border energy flows with the harmonization terminology, concepts, and the definitions of energy products.

This will allow each country to work together for the benefit of all three countries.

The centerpiece of our trade relationship, of course, is NAFTA, which entered into force on January 1st, 1994. On May 18th of this year, the Trump administration sent a 90-day notification to Congress of its intent to begin talks with Canada and Mexico to renegotiate NAFTA.

Currently, negotiations are holding intersessional meetings in Washington through mid-December in advance of a sixth round of negotiations which are scheduled to be held from January 23rd to the 28th in Montreal.

My expectation is that today's hearing will provide some context for the NAFTA negotiations. I look forward to hearing the testimony of our witnesses and engaging in a conversation about the benefits of a robust North American energy sector.

[The prepared statement of Mr. Upton follows:]

PREPARED STATEMENT OF HON. UPTON

Good morning and welcome to all our witnesses. I appreciate you all taking time so close to the holiday season to be with us today. This hearing builds upon the Energy and Commerce Committee's impressive record of hearings on energy security, job creation and infrastructure.

One of the many things I appreciate about our subcommittee is that we have Members who represent both northern and southern border States. As a proud Michigander, I will be focusing my comments and questions more on our relationship with Canada, while I am sure my friends from Texas will be focusing more on Mexico. But one thing I want to make clear: This hearing is about North American integration, specifically, the impacts and future of North American energy trade. We want to examine how North American energy trade has strengthened all our economies and our trading relationships. Nationally, 14 million jobs are tied to trade with Mexico and Canada—in Michigan, it's nearly 400,000. This trade makes us more competitive internationally and can prove to be the difference between creating or shedding jobs. Eighty-four percent of petroleum and coal products exported from Michigan go to either Mexico or Canada.

The energy markets of Canada, Mexico and the United States are becoming increasingly interdependent, thanks in large part to the free trade status of energy commodities. When we think about energy trade, we are including crude oil, refined petroleum products and other liquids, natural gas and electricity. To sum it up: we have transmission lines that go across the border; we have pipelines that go across or under the border; and we have goods and services that go across the border. Energy trade is much more than just commodities—there is also a huge supply chain supporting everything. The multiplier effect of energy trade is great throughout our economy.

Trilateral engagement is not just about trade, but also about information sharing. Just last month, the Energy Information Administration announced the launch of a website on North American Cooperation on Energy Information or NACEI. This resource consolidates energy-related data, maps, and references from the US, Canada and Mexico. The current areas of focus include: comparing, validating, and improving respective energy import and export information; sharing publicly available geospatial information related to energy infrastructure; exchanging views and information on projections of cross-border energy flows, and harmonizing terminology, concepts, and definitions of energy products. This will allow each country to work together for the benefit of all three countries.

The centerpiece of our trade relationship is the North American Free Trade Agreement or NAFTA, which entered into force on January 1, 1994. On May 18, 2017, the Trump administration sent a 90-day notification to Congress of its intent to begin talks with Canada and Mexico to renegotiate NAFTA. Currently, negotiators are holding intersessional meetings in Washington, DC though mid- December in advance of a sixth round of negotiations which are scheduled to be held from January 23–28, 2018 in Montreal, Canada.

My expectation is that today's hearing will help provide some context for the NAFTA renegotiations. I look forward to hearing the testimony of our witnesses and engaging in a conversation about the benefits of a robust North American Energy sector.

Mr. UPTON. And with that, I yield to the ranking member of the subcommittee, Mr. Rush.

OPENING STATEMENT OF HON. BOBBY L. RUSH, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. RUSH. I want to thank you, Mr. Chairman, for holding this important hearing on the impact and future of the North American energy and trade.

Mr. Chairman, I have held several meetings with relevant stakeholders concerned with the Trump administration's ill-advised decision to try and unilaterally change or get rid of existing agreements, existing accords, and treaties.

Unfortunately, Mr. Chairman, we have heard the President talk of reneging on a mass array of deals signed by the previous administration on everything from the Iran nuclear deal to the Paris

agreement up to and including major trade agreements such as NAFTA.

Personally, Mr. Chairman, while I did not vote for NAFTA when it came before the House, I do have concerns over the constitutionality of a President singlehandedly changing or overturning a trade agreement that was passed by Congress.

Additionally, Mr. Chairman, and as importantly, I also have grave concerns over the global perception of the credibility of the United States when neither our friends or allies nor other foreign powers can depend on the sincerity of the U.S. Government if at any time a new President takes office, he or she chooses to reverse or renege on agreements signed under the previous administration.

Unfortunately, Mr. Chairman, this appears to me a recurring theme of this President's chaotic governing philosophy, where no previous accord is ever safe from interference and any promise can be voided at any time, regardless if it is made to friend or foe.

Mr. Chairman, based just on the merits, the Energy Information Administration estimates that energy trade between the North American countries exceeded $140 billion just in 2015 alone, and with the U.S. importing an estimated $100 million and exporting over $40 million in energy products with Canada and Mexico.

Additionally, Mr. Chairman, just last year, former President Obama signed the North American Climate, Clean Energy, and Environment Partnership along with his counterparts from Canada and Mexico.

This important agreement established several objectives, Mr. Chairman, and benchmarks aimed at advancing clean energy and reducing climate change-inducing pollutants between all three countries with the goal of 50 percent clean power generation by the year 2025.

Mr. Chairman, this pact would also help to develop cross-border transmission partners while improving and aligning appliance and equipment efficiency standards between all three partners.

At a time when the U.S. has become more intertwined and interdependent in our dealings with other countries both economically as well as for national security purposes, we cannot expect to be seen as a credible leader within the global arena while at the very same time thumbing our nose at previous deals and agreements just because they were signed by a President from another party.

Instead, we must show leadership in Congress to demonstrate to our friends and allies as well as to our foes and competitors that the U.S. will honor the deals that we signed and we will not renege on our promises.

Mr. Chairman, I want to thank you. I look forward to hearing from our witnesses today and also want to at the same time welcome our witnesses.

And I yield back the balance of my time.

Mr. UPTON. Ranking member yields back.

I know the chairman of the full committee is on his way from the hearing that's downstairs. So, at this point, I'll yield 5 minutes to the ranking member of the full committee, Mr. Pallone.

OPENING STATEMENT OF HON. FRANK PALLONE, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. PALLONE. Thank you, Mr. Chairman.

Regardless of the outcome of the current NAFTA talks, the U.S. will continue to trade fossil fuel commodities with Canada and Mexico for years to come, and I'd like to see a change in our focus.

Rather than focusing on trading fossil fuel commodities, we should prioritize expansion of renewable energy technologies and how they can benefit the North American electricity grid.

According to the Energy Information Administration, more than half of new electricity-generating capacity added to the grid between 2014 and '16 came from renewable technologies, and we should look at expanding this technology so that we can make renewables a larger part of our electric exports.

In 2009, the U.S.-Canada clean energy dialogue was launched to encourage clean energy technology development among our two nations. One key aspect of this collaboration focused on expanding and modernizing the North American transmission grid to facilitate movement of renewable power between the United States and Canada, and right now there are several large-scale transmission projects in the works to bring renewable power across the United States' borders with Canada and Mexico, and the modernization of the grid in order to facilitate these types of projects is critical to the overall future of energy development in North America.

The United States has also forged a strong agreement with Canada and Mexico to address climate pollution and advance clean energy.

In 2016, the countries established the North American Climate, Clean Energy, and Environment Partnership. Collectively, the partnership set a goal of 50 percent clean power generation and the more than 40 percent reduction on methane emissions by 2025.

And the Trump administration has been silent on this commitment. But based on the President's foolish decision to walk away from the Paris climate agreement, I do not have high hopes that he will fulfill this commitment.

It's unfortunate that the Republican majority has focused today's hearing primarily on fossil fuels. Instead, I believe it's even more important for us to focus on ways we can continue to work with our neighbors to reduce carbon emissions and expand trade and clean energy technologies. We have a knowledgeable panel of witnesses before us, and I look forward to hearing their testimony.

[The prepared statement of Mr. Pallone follows:]

PREPARED STATEMENT OF HON. FRANK PALLONE, JR.

Mr. Chairman, regardless of the outcome of the current NAFTA talks, the U.S. will continue to trade fossil fuel commodities with Canada and Mexico for years to come. I would like to see a change in our focus. Rather than focusing on trading fossil fuel commodities, we should prioritize expansion of renewable energy technologies and how they can benefit the North American electricity grid. According to the Energy Information Administration, more than half of new electricity generating capacity added to the grid between 2014 and 2016 came from renewable technologies. We should look at expanding this technology so that we can make renewables a larger part of our electric exports.

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The U.S. has also forged a strong agreement with Canada and Mexico to address climate pollution and advance clean energy. In 2016, the countries established the North American Climate, Clean Energy, and Environment Partnership. Collectively, the partnership set a goal of 50 percent clean power generation and a more than 40 percent reduction in methane emissions by 2025. The Trump administration has been silent on this commitment, but based on the President's foolish decision to walk away from the Paris Climate Agreement, I do not have high hopes that he will fulfill this commitment.

It's unfortunate that the Republican majority has focused today's hearing primarily on fossil fuels. Instead, I believe it is even more important for us to focus on ways we can continue to work with our neighbors to reduce carbon emissions and expand trade in clean energy technologies.

We have a knowledgeable panel of witnesses here before us, and I look forward to hearing their testimony on this timely issue. Thank you, Mr. Chairman, and I yield back the remainder of my time.

Mr. PALLONE. I don't know if anyone else wanted—yes, I yield the remainder of my time to Mr. Green.

Mr. GREEN. Thank you, Ranking Member, for yielding to me.

Energy trade between the U.S., Canada, and Mexico has been at an all-time high in recent years. Where the U.S. is the largest producer of crude oil on the continent, Canadian reserves far outstrip our own. Mexico also has significant discoveries of offshore sites in the Gulf over this summer.

Many Texas refineries rely on Mexican imports for their source of crude oil. At the end of this year, Mexico has a demand of about 600,000 barrels a day of gasoline imports due to their lack of refining capacity.

A huge percentage of this 600,000 barrels a day will come from the refinery complexes we have along the Texas Gulf Coast. While the U.S. and Canada have integrated our energy markets to a great degree post-NAFTA and with Mexico's recent reforms in the coming years, cooperation among the countries will only get stronger.

NAFTA has been a success in many ways but did not contain many provisions on energy policy. Our first goal when discussing how to improve NAFTA should be closer ties and friendship among all three countries.

Our second goal should be an integrated North American energy market. This is one reason I introduced our cross-border infrastructure bill with our colleague, Representative Mullin, earlier this year.

There are 11 cross-border projects awaiting a decision by the Department of State in the present and including electric lines and water pipelines. It's Congress' responsibility to create the regulatory rules by which infrastructure is constructed.

Our bill, H.R. 2883, which passed our committee on the floor of the House, would create a regulatory process at the Federal Energy Regulatory Commission, Department of State, Department of Energy to permit cross-border infrastructure by recognizing the energy trade between Mexico, Canada as in our national interest.

It is my hope that the Senate will soon take up this language so we can continue building on that success, and we should embrace the changes taking place in North America and harmonize our policies with those of our neighbors to the north and the south.

And again, thank you for the time by our ranking member.

I yield back.

Mr. UPTON. The gentleman yields back.

We are ready for the testimony. I want to appreciate our witnesses providing the testimony in advance. It'll be made part of the record.

You will be given each the opportunity to take 5 minutes to summarize that statement, and then we will begin with questions.

Our witnesses today: Karen Harbert, president and CEO, Global Energy Institute, U.S. Chamber of Commerce, and a former undersecretary from the Department of Energy—goes back a long ways; Chet Thompson, president of the American Fuel and Petrochemical Manufacturers; Allen Burchett, global head of strategic projects on behalf the National Association of Manufacturers; and Alan Krupnick, senior fellow for the Resources for the Future.

Ms. Harbert, we will start with you. Welcome. Nice to see you.

STATEMENTS OF KAREN A. HARBERT, PRESIDENT AND CHIEF EXECUTIVE OFFICER, GLOBAL ENERGY INSTITUTE, U.S. CHAMBER OF COMMERCE; CHET THOMPSON, PRESIDENT AND CHIEF EXECUTIVE OFFICER, AMERICAN FUEL & PETROCHEMICAL MANUFACTURERS; ALAN KRUPNICK, PH.D., SENIOR FELLOW, RESOURCES FOR THE FUTURE; ALLEN BURCHETT, GLOBAL HEAD OF STRATEGIC PROJECTS, ABB, INC., ON BEHALF OF THE NATIONAL ASSOCIATION OF MANUFACTURERS

STATEMENT OF KAREN A. HARBERT

Ms. HARBERT. Nice to see you. Thank you, Mr. Chairman, and thank you, Ranking Member Rush, and all members of the committee.

As the chairman said, I am Karen Harbert, president and CEO of the U.S. Chamber of Commerce's Global Energy Institute.

As many of you have noted, the U.S., Canada, and Mexico have a long history of shared energy trade, but, for most of that time as a global economic leader and a large energy consumer, the U.S. has been purchasing large supplies of oil and natural gas from both nations.

Today, the U.S. has the largest hydrocarbon resource base in the world plus very large nuclear and renewable bases in this country.

The speed with which the U.S. has moved from energy scarcity to abundance has been nothing short of breathtaking. The U.S. is fortunate to have two neighboring countries—Canada and Mexico—that are also large energy producers. Canada ranks number 8 globally and Mexico 24th.

Unthinkable 10 years ago today, North America's abundant energy resources are upending the global energy market. Combined production from the U.S., Canada, and Mexico accounts for 19 percent of all crude oil, 20 percent of natural gas, and 12 percent of all coal output.

Having a large share of world energy production in North America not only helps our own energy and national security, it also helps global energy security by diversifying supplies, ensuring that a large share of global output occurs in reliable countries.

We have always had a very open trade relationship with Canada. While our trade relationship with Mexico has traditionally been strong, Mexico has long prohibited foreign investment in its hydrocarbon sector.

But that all changed in 2013 when Mexico instituted constitutional reforms to put an end to the more-than-70-year monopoly enjoyed by state-owned oil company Pemex.

Today, the U.S. is a net importer of crude oil from both Mexico and Canada. In 2016, the U.S. imported about 580,000 barrels per day from Mexico and nearly 3 million barrels per day from Canada.

Notably, the U.S. now imports more oil from Canada and Mexico than OPEC. That's very important to take note of.

Since 2011, the U.S. has been a net exporter of refined products. There was lively trade in products among U.S., Canada, and Mexico, and the trends now favor the United States, growing its share.

Although the U.S. is a net importer of natural gas from Canada, that is not expected to remain much longer. The U.S. has been a net exporter of gas to Mexico since the mid-1980s, and exports are growing tremendously.

As more infrastructure is added linking the U.S. and Canada, we welcome legislation to facilitate that. We expect that the U.S. will be a net exporter to both countries.

In 2016, Mexico and Canada accounted for 13 percent of all U.S. net coal exports, which yielded a $440 million trade surplus.

We expect the downward trend in coal exports to continue and exports to other countries to grow. We have a growing and integrated electricity market. There are 25 transmission crossings between the U.S. and Canada and 11 crossings between the United States and Mexico.

So, in summary, for the last 6 years we have been running a trade surplus with Canada and Mexico in refined petroleum and coal, and while the trade deficit in oil and gas remains, it will be shrinking rapidly.

The abundance of affordable energy in North America has given U.S. businesses a critical leg up. We pay about 2 to 4 times less for natural gas, coal, and electricity than many of our competitors.

But the benefits aren't limited to just industry. It's consumers, too. Over the last 6 years, average annual household energy expenditures declined by 14.1 percent.

Now on to NAFTA. As these trends demonstrate, the U.S. energy economy has nothing to fear from NAFTA and a lot to gain. A modernized NAFTA could sustain advantages for North American industry and advance the market-based integration of our energy sectors.

However, we are concerned that withdrawing from NAFTA would impose unacceptably high cost to the U.S. when we are engaged in historic tax reform and regulatory reform to get our economy growing above 3 percent.

We are also worried about attempts to undermine the investor state dispute settlement protections in NAFTA, which are indispen-

sable to maintaining our growing energy sector and provide neutral arbitration to ensure other countries treat our investors fairly.

In short, the robust energy trade amongst the U.S., Canada, and Mexico would be threatened by a withdrawal from NAFTA. Given all of this, it is our strongest recommendation that, if NAFTA modernization cannot be reached, that the administration must retain its commitment to the current trade agreement.

Today, the story of North American energy is one of increased economic, national, and energy security for all three countries.

Thank you very much.

[The statement of Ms. Harbert follows:]

GLOBAL ENERGY INSTITUTE
U.S. CHAMBER OF COMMERCE

Statement of the U.S. Chamber of Commerce

ON: The Impacts and Future of North American Energy Trade

TO: U.S. House Committee on Energy and Commerce Subcommittee on Energy

DATE: December 13, 2017

1615 H Street NW | Washington, DC | 20062

The U.S. Chamber of Commerce is the world's largest business federation representing the interests of more than 3 million businesses of all sizes, sectors, and regions, as well as state and local chambers and industry associations. The Chamber is dedicated to promoting, protecting, and defending America's free enterprise system.

More than 96% of Chamber member companies have fewer than 100 employees, and many of the nation's largest companies are also active members. We are therefore cognizant not only of the challenges facing smaller businesses, but also those facing the business community at large.

Besides representing a cross-section of the American business community with respect to the number of employees, major classifications of American business—e.g., manufacturing, retailing, services, construction, wholesalers, and finance—are represented. The Chamber has membership in all 50 states.

The Chamber's international reach is substantial as well. We believe that global interdependence provides opportunities, not threats. In addition to the American Chambers of Commerce abroad, an increasing number of our members engage in the export and import of both goods and services and have ongoing investment activities. The Chamber favors strengthened international competitiveness and opposes artificial U.S. and foreign barriers to international business.

Subcommittee on Energy
Energy and Commerce Committee
United States House of Representatives

THE IMPACTS AND FUTURE OF NORTH AMERICAN ENERGY TRADE

Testimony of
Hon. Karen A. Harbert
President & CEO
Global Energy Institute
U.S. Chamber of Commerce

Wednesday, December 13, 2017

Thank you, Chairman Upton, Ranking Member Rush, and members of the Committee. I am Karen Harbert, president and CEO of the Global Energy Institute (GEI), an affiliate of the U.S. Chamber of Commerce, the world's largest business federation representing the interests of more than three million businesses of all sizes, sectors, and regions, as well as state and local chambers and industry associations, and dedicated to promoting, protecting, and defending America's free enterprise system.

The mission of the GEI is to unify policymakers, regulators, business leaders, and the American public behind a common sense energy strategy to help keep America secure, prosperous, and clean. In that regard we hope to be of service to this Committee, this Congress as a whole, and the administration.

STRATEGIC CONTEXT

The United States, Canada, and Mexico have a long history of shared energy trade and cooperation. For most of that time, as a global economic leader and large energy user, the United States has relied on large supplies of oil and natural gas from both nations, who have been happy to supply it. Although an energy trade imbalance has been the norm, trading energy with our neighbors to the north and south provides tremendous benefit to the United States' economic and energy security.

Today, the U.S. has the largest hydrocarbon resource base in the world (only Russia comes close),[1] plus very large nuclear and renewable resources. We have always had an abundance of coal, and now thanks to the application of hydraulic fracturing, horizontal drilling, and advanced seismic imaging, the United States is tapping our huge reserves of oil and natural gas and making us the world's largest producer of these fuels and second largest producer of coal.

The rapidity with which the United States has moved from energy scarcity to energy abundance has been nothing short of breathtaking—so fast, in fact, that our energy policy remained mired in a mindset of scarcity, a paradigm that is no longer valid. In short, our energy policy and regulations are only now just catching up with our new energy reality.

The United States also is fortunate to have two neighboring countries, Canada and Mexico, that are themselves large energy producers (Canada ranks 8th globally in hydrocarbon resources and Mexico 24th). North America's abundant energy resources are upending the global energy market. In the U.S., this newfound abundance creates millions of well-paying jobs and new industries, and strengthens our nation's economy and long-term energy security. With the right policies in place, the U.S. and all of North America have the opportunity to have the greatest influence on the global energy marketplace to the greater benefit for our region.

Many experts now believe energy self-reliance for North America, if not for the United States, actually may be within reach in the coming decade. The Trump Administration's actions and commitment to provide regulatory reform for the energy sector are moving us closer to that goal. With the right policies, the United States, Canada, and Mexico can move to strengthen our ties and cement North America's status as an energy superpower.

North American Energy Contributes to U.S. and Global Energy Security

North America is a big player in world energy markets. Combined production from the United States, Canada, and Mexico accounts for 19% of crude oil, 28% of natural gas, and 12% of coal output globally.

According to the Energy Information Administration (EIA), petroleum fuels will remain the largest energy source worldwide for decades into the future. Its latest *International Energy Outlook*[2] projects that energy demand between 2017 and 2050 is expected to grow by about 57% worldwide, most of which will come in developing countries. Combined petroleum, natural gas, and coal use is forecast to grow 29% by 2050, with natural gas leading the way (up 67%) followed by petroleum (25%) and coal (3%). The total share of global energy demand met by hydrocarbons is expected to account for 77% in 2050, down a small amount for the current figure of about 83%. The increased competition for fuels in the coming decades underlines the

[1] Congressional Research Service. 2010. *U.S. Fossil Fuel Resources: Terminology, Reporting, and Summary*.
[2] EIA. 2017. Annual Energy Outlook 2017. Available at: https://www.eia.gov/outlooks/ieo/.

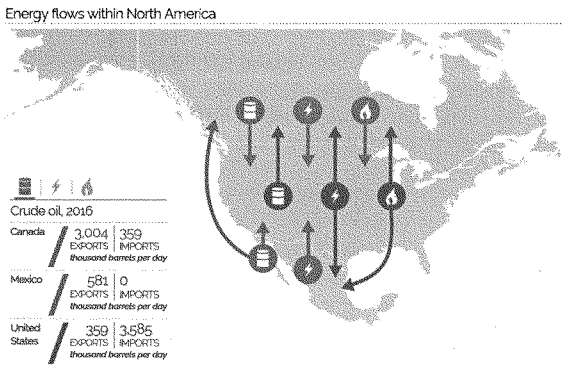
importance of having a stable and secure regional energy market like we have in North America, especially in oil and increasingly in natural gas.

Having a large share of world production in North America not only helps our own energy security, it also helps global energy security by diversifying supplies and by ensuring that a large share of global output occurs in reliable countries that will not use energy as a geopolitical weapon. GEI has taken a close look at energy supply issues and how they impact U.S. and international energy security as part of our *Index of U.S. Energy Security Risk and International Index of Energy Security Risk* studies.[3] One way to look at the supply risk for oil, for example, is to measure how much of the global oil supply is in the hands of potentially politically unstable countries. Using Freedom House rankings of civil and political liberties, we have calculated the share of crude oil supply produced in countries Freedom House classifies as Free, Partly Free, and Not Free. Since 1980 oil production in Not Free and Partly Free countries generally amounted for between 60% and 70% of global output. At a time when North Sea oil output is falling, large emerging economies are growing into large oil consumers, putting pressure on global spare oil production capacity and political stability in many producing countries also is on the rise, greater output from North America is needed and welcome.

NORTH AMERICAN ENERGY TRADE

In the years since NAFTA was negotiated, the North American energy sector has been fundamentally transformed. Given our proximity to such large and secure energy resources, it is not surprising that Canada and Mexico are among America's largest energy trading partners, as the map from North American Cooperation on Energy Information, in which EIA participates, suggests (Figure 1).

Figure 1.



Source: North American Cooperation on Energy Information

Total primary energy production and consumption are about in balance in North America today. Canada produces more energy than it consumes, the United States produces less energy than it consumes, and Mexico produces about the same amount of energy it consumes. There are, of course, differences when individual fuels are considered. Nevertheless,

[3] Available at: https://www.globalenergyinstitute.org/energy-security-risk-index.

it is clear that North America is both a huge energy consumer and producer, and energy production in particular is expected to increase in the coming years.

The integrated nature of the North American fuel and electricity markets enhances the flexibility, reliability, and cost-effectiveness of the energy supply and distribution system for American consumers, business, and industry.

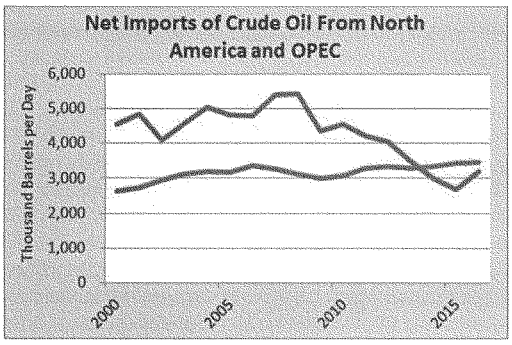
Pipeline, rail, truck, marine vessels, and transmission lines carry crude oil, refined petroleum products, natural gas, and electricity across borders to distribution channels that supply communities across the continent. Crude oil, refined products, natural gas, and natural gas liquids move north and south through more than sixty cross-border pipelines to satisfy markets. Of course, the pending Keystone XL pipeline project has brought much attention to our energy relationship and crude imports from Canada. U.S. natural gas pipeline export capacity is expected to double by 2018 with the completion of six new pipelines to Canada. Transmission lines also transmit electricity north and south across borders, primarily between the U.S. and Canada, but increasingly between the United States and Mexico as its electricity market grows. Today there are 36 major transmission interconnects between the United States, Canada, and Mexico.

We have always had a very open energy trade and investment relationship with Canada, and while our trade relationship with Mexico has traditionally been strong, Mexico has long prohibited foreign investment in its hydrocarbon sector. But that, too, has changed. To combat rapidly declining production since 2004, the Mexican government in 2013 instituted constitutional reforms to put an end to the more than 70-year monopoly enjoyed by state-owned oil company Petroleos Mexicanos (Pemex was nationalized in 1938) and to open up its hydrocarbon sector to competition. Under these reforms, U.S. and other foreign companies will be able to share in profits from production. The move is designed to attract investment in shale oil deposits, which EIA pegs at about 30% greater than the country's proven oil reserves, and ultra-deep water basins in the Gulf of Mexico. The United States and Mexico also completed the Transboundary Hydrocarbons Agreement in 2012, settling a decade-long dispute in an offshore area straddling the two borders that will open up more than 1.5 million acres of the Gulf to joint oil and gas development by Pemex and U.S. oil companies. These reforms promise to boost sagging Mexican oil production and integrate North American markets further.

Whereas the United States traditionally has been a big purchaser of North American energy, it is rapidly becoming a large supplier of crude oil, refined petroleum, and natural gas. These trends are discussed below. To avoid confusion and to make them comparable, note that the charts in the following discussion of energy trading measure *net imports*. This means that a negative number implies the United States exports more than it imports. Unless otherwise noted, all data are from EIA and all dollar figures are in constant 2015$.

- **Crude Oil Supply**: The United States is today a net importer of crude oil both from Mexico and Canada. In 2016, the United States imported about 580,000 barrels per day (b/d) from Mexico and nearly 2.9 million b/d from Canada. These amounts have been growing from

Figure 2.



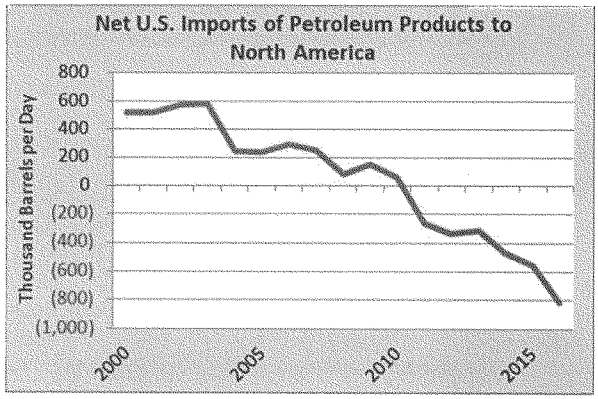
Source: Energy Information Administration

Canada, which has seen its domestic crude oil production rise, and decreasing from Mexico, which has seen its crude oil output decline sharply since 2004.

On the eve of the Arab Oil Embargo of 1973, 82% of the U.S. crude oil supply—defined here as domestic production plus net imports—came from North America and 18% came from the Organization of Petroleum Exporting Countries (OPEC). By 2008, the United States was getting just 55% of its supply from North America and 37% from OPEC. Today, those numbers are nearly back where they were in 1973, with North America providing almost 80% of our crude oil supply and OPEC 20%. This is a remarkable turnaround in such a short period of time. Much of that was because of increased U.S. production, but the share of our imported oil from North America also increased. Figure 2 shows the rising trend in net crude oil imports since 2000 from North America (Canada and Mexico) and since around 2008 the declining trend from OPEC.

- **Refined Petroleum Products:** Since 2011 the United States has been a net exporter of refined petroleum products. There is a lively trade in products among the United States, Canada, and Mexico. Recent trends are very favorable to the United States. In 2000, net imports of products to the United States from Canada and Mexico combined were about 520,000 b/d. Today, the United States is a net exporter of product to the tune of about 800,000 b/d (Figure 3), and that is set to increase.

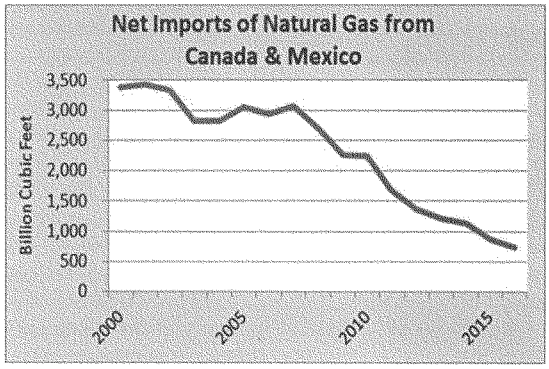
Figure 3.



- **Natural Gas:** Although the United States is a net importer of natural gas from Canada and Mexico, that is not expected to last much longer. Figure 4 illustrates the steady decline in net imports of

natural gas since about 2007. The United States has been a net exporter of gas to Mexico since the mid-1980s. In the last couple of years, however, the amounts have grown tremendously, growing from about 300 to 400 billion cubic feet (bcf) on the early to mid-2000s to 1,400 bcf in 2016. During the same time, net imports from Canada have shrunk from nearly 3,500 bcf in the mid-2000s to 2,150 bcf in 2016. As more infrastructure is added linking the U.S. and Canada and Mexico, we expect that the U.S. will be a net exporter to both countries. (Much of Canadian imports are to northern states not served by domestic infrastructure.)

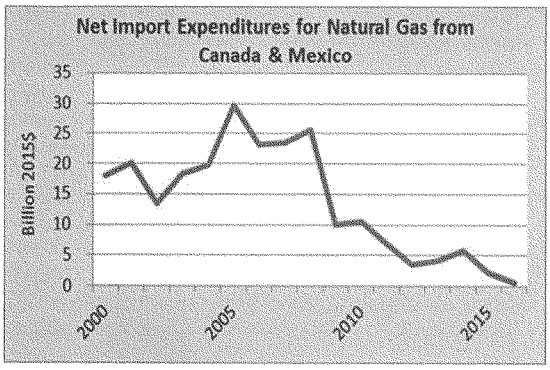
Figure 4.



Source: Energy Information Administration

Added to these trends in the North American natural gas trade is the fact that the United States generally pays less for natural gas coming from Canada and Mexico than Canada and Mexico pay for U.S. gas. The result is that U.S. import expenditures for natural gas are much lower than in the past (Figure 5). Since their peak of nearly $30 billion in 2005, U.S. net expenditures for natural gas have declined to below $600 million in 2016. We expect that in the future, U.S. net expenditures for natural gas with Canada and Mexico will be negative—that is, revenues from the sale of U.S natural gas to Canada and Mexico will be greater than the revenues those two countries will receive from the United States to purchase their natural gas.

Figure 5.



Source: Energy Information Administration

- **COAL:** The United States is a net exporter of coal to Canada and Mexico. Volumes of coal to these countries has declined considerably over the last decade primarily because of reduced demand for U.S. coal in Canada, which declined from nearly 18 million short tons in 2006 to about 4 million tons in 2016. Over the

same period Mexican demand for U.S. coal has increased from about 570,000 to just over 3 million short tons. In 2016, these two countries accounted for 13% of total U.S. net coal exports, enough for a $440 million trade surplus. The downward trend in coal exports to these two countries is expected to continue. U.S. exports to other regions of the world, however, are expected to grow.

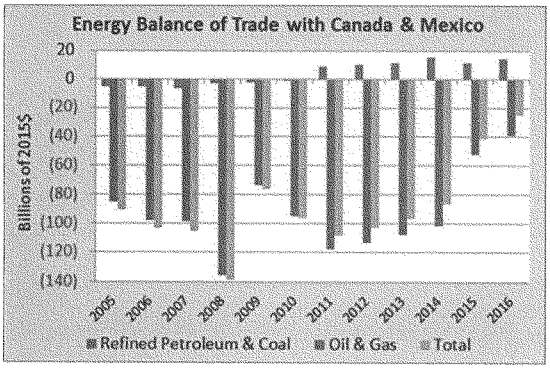
- **ELECTRICITY:** Although the electricity trade among the United States, Canada, and Mexico is small, it is important regionally. The United States in a net importer of electricity from Canada and Mexico, more that 90% of which comes from Canada (much of which is from renewable sources). The electric transmission systems linking Canada and the United States are highly integrated, especially in the Northeast. There are 25 transmission crossing between the United States and Canada and 11 crossings between the United States and Mexico.

EIA reports that the major electricity trade flows from Canada to the United States occur from Manitoba to the Midwest and from eastern Canada to the New England, New York, and Midwest regional transmission organizations. The large output from hydroelectric stations in the Pacific Northwest, however, makes this U.S. region an exporter to Canada, especially during spring melts that swell reservoirs. From 2008 to 2016, net imports of electricity from Canada and Mexico have grown from about 0.8% of total U.S. sales to 1.6%.

- **ENERGY TRADE BALANCES:** More and more of U.S. energy dollars spent in North America are being spent in the United States as result of the trends discussed above. The U.S. Census Bureau publishes energy trade statistics, and these can be used to calculate balances of trade. In the chart below, we have North American trade data for two energy categories: (1) refined petroleum and coal; and (2) [crude] oil and gas.

For six years, we have been running a trade surplus with Canada and Mexico in refined petroleum and coal (Figure 6). (Note that in the chart, a positive number indicates a trade surplus, a negative number a trade deficit.) Also in the past six years, the trade deficit with these countries in oil and gas has been shrinking rapidly. Combined (the green bars), the net energy trade deficit declined from just shy of $110 billion in 2011 to $25 billion in 2016, a drop of three-quarters.

Figure 6.



Source: Energy Information Administration

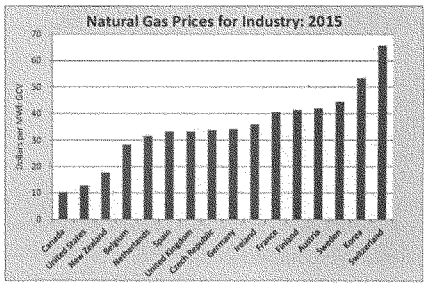
AMERICA'S ENERGY EDGE

The abundance of affordable energy in North America, led by America's energy revolution, has given U.S. businesses a critical leg up in today's intensely competitive global economy. High energy prices weigh more heavily on energy intensive industries such as chemicals, manufacturing, and steel. Figures 7, 8, and 9 show comparative price data for 2016 (in nominal U.S. dollars) from the International Energy Agency (IEA).[4] They clearly show that American industry pays two to four times less for natural gas, coal, and electricity than many of its global competitors, a difference that is helping to drive a U.S. manufacturing revival. Lower American energy costs are forcing many trade-exposed companies in these sectors to shift production to the United States.

Shale energy has brought tremendous economic benefits to communities across the United States. Research by IHS indicates that every state is benefitting, regardless of whether shale development is happening in their region. IHS found that by 2020 almost $113 billion in revenue will be created (in constant 2012$) and that 2.9 million direct and indirect jobs will result from the economic activity associated with unconventional oil and gas development (shale).[5]

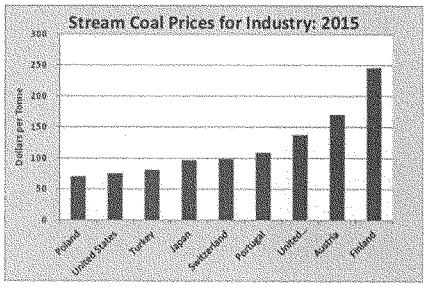
A follow up to the IHS study of the downstream impacts also concludes that lower prices for energy and chemical

Figure 7.



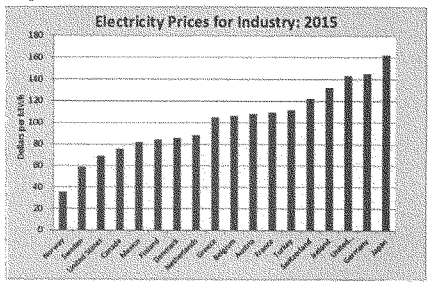
Source: International Energy Agency

Figure 8.



Source: International Energy Agency

Figure 9.



Source: International Energy Agency

[4] IEA. 2017. *Key World Energy Statistics 2017*. Available at: http://www.iea.org/publications/freepublications/publication/KeyWorld2017.pdf.

[5] IHS. 2012. *America's New Energy Future: The Unconventional Oil and Gas Revolution and the US Economy*. Volume 2 —State Economic Contributions. Available at: https://www.globalenergyinstitute.org/sites/default/files/Americas_New_Energy_Future_State_Highlights_Dec2012.pdf.

feedstocks brings great competitive advantages to American manufacturing.[6] The IHS CERA research projects that, between 2012 and 2025, nearly $346 billion (in constant 2012$) will be invested across midstream and downstream energy and energy-related chemicals value chains. Roughly $100 billion of that will be directed toward manufacturing and construction of over 47,000 miles of new or modified pipeline infrastructure. Major investments related to shale oil and natural gas production are already taking place within the chemical-related industries, with cumulative investments expected to grow to more than $129 billion by 2025. These investments are taking place in the new chemical, plastics, and related manufacturing facilities across the U.S. According to the IHS CERA:

> *The unconventional revolution is also contributing to a shift in global competitiveness for the United States by unlocking new production cost advantages for US industries benefitting from lower prices for raw materials and the energy they use. IHS has leveraged its US Macroeconomic Model to capture the benefits of lower natural gas prices and accompanying lower electricity prices on the general economy. Our analysis demonstrates that this manufacturing renaissance will increase industrial production by 3.5% by the end of this decade and by 3.9% by 2025. Output by the manufacturing sector will increase by $258 billion in 2020 and $328 billion in 2025. The US competitive advantage is particularly pronounced in energy-intensive industries, such as energy-related chemicals which in the coming years will be a primary beneficiary of lower prices for energy and feedstock. Industries such as organic chemicals, resins, agricultural chemicals, petroleum refining, metals such as iron and steel, and machinery are among the top-ranked sectors benefiting from this revolution. These sectors are expected to benefit from lower energy prices (for those that use oil and natural gas as feedstocks), lower electricity prices, and increased demand for their products as growth in overall GDP spurs domestic consumption.*

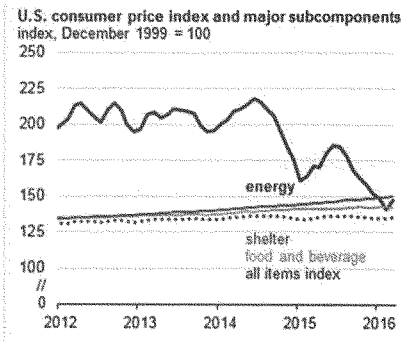
- **Consumer Benefits**: But it is not only industry that benefits, consumers do, too. The dramatic increase in development and supply of North American energy resources has also been beneficial to American consumers by putting downward pressure on prices. The chart in Figure 10 illustrates the steep decline in the consumer price index for energy from a range of about 200 to 225 to just about 150, on par with the consumer price indexes for shelter and for food and beverages. As a result, energy expenditures per household have declined from roughly 8% to about 6%, a welcome relief to consumers on pinched budgets.

Declining energy prices lower the cost of living for Americans. Since June 2014, decreases in crude oil and natural gas prices have reduced household energy costs, according to EIA and the Bureau of Labor Statistics. In constant 2015 dollars, average annual household energy expenditures peaked at about $5,300 in 2008. Between 2008 and 2014, average annual

[6] IHS. 2013. *America's New Energy Future: The Unconventional Oil and Gas Revolution and the US Economy*. Volume 3 — A Manufacturing Renaissance. Available at: https://www.globalenergyinstitute.org/sites/default/files/file-tool/Americas_New_Energy_Future__Exec_Sum.pdf.

household energy expenditures declined by 14.1%. During this period, household expenditures decreased by 17.7% for gasoline, 25.1% for natural gas, and 28.3% for fuel oil.

Figure 10.



Source: Energy Information Administration

EIA found that lower gasoline prices have contributed to decreasing household gasoline expenditures since 2012, even though gasoline consumption has generally increased.[7] EIA estimates that gasoline prices will average $2.48 per gallon in 2017, which is 33% lower than the price in 2012. Household spending for gasoline is expected to remain below $2,000 in 2017, which is 2.5% of household income. The recent peak in household gasoline expenditures was $2,715 or 4% or household income in 2008. U.S. gasoline prices in 2016 were the lowest since 2004.

As mentioned above, North America's integrated energy infrastructure network also benefits American consumers by improving flexibility and reliability for the energy supply and distribution system. This is particularly beneficial for consumers when major supply disruptions occur.

NORTH AMERICAN ENERGY AND NAFTA

The growth of the United States' and North America's influence on the global energy marketplace is monumental, and provides great benefits to the economic and energy security of our nation and region. This growth is reliant on policies that promote cooperation amongst the North American nations. As recent trends in energy trade among the United States, Canada, and Mexico clearly demonstrate, the United States energy economy has nothing to fear from the North American Free Trade Agreement (NAFTA)—and a lot to gain.

A modernized NAFTA could help solidify the recent advances and create advantages for North American industry, advancing market-based integration of the energy sector, including hydrocarbons production, transportation and processing, as well as electricity generation, transmission, and distribution.

The agreement should guarantee that trade in hydrocarbons, including natural gas, crude oil, and refined oil products, will be uninhibited between the partners by quantitative measures or tariffs affecting either imports or exports. NAFTA partners should also agree to

[7] EIA. 2017. *Today in Energy*. U.S. household spending for gasoline is expected to remain below $2,000 in 2017. Available at: https://www.eia.gov/todayinenergy/detail.php?id=33232.

facilitate the development of safe cross-border interconnections for electricity and hydrocarbons. A modernized NAFTA should also prohibit local content rules and support common standards and regulations governing the energy sector based on best available practices.

The flip side of modernization, however, is the threat of withdrawing from NAFTA, which is apparently under consideration as a negotiating tactic. A breakdown in the agreement could also occur if the U.S. Trade Representative proceeds with a series of damaging NAFTA proposals strongly opposed by the U.S. business and agriculture community, congressional trade leaders, and the Canadian and Mexican governments.

The Chamber is concerned that withdrawing from NAFTA would impose unacceptably high costs on the United States. Indeed, at a time when we are engaged in tax and regulatory reform to push and maintain the U.S. economic growth rate above 3%, pulling out of NAFTA would undo most of the good these policies are expected to accomplish. It would mean restoring the steep tariffs and other barriers that shut U.S. exports out of Canada and Mexico prior to NAFTA and would lead directly to lost export sales and lost American jobs—1.2 million by one credible estimate.[8] The states that would be hit hardest include Michigan, Wisconsin, and Pennsylvania and other states in our agricultural heartland.[9]

Even without withdrawal, some proposals would undermine the agreement's benefits. In the energy sector, the Chamber is worried about attempts to undermine the Investor-State Dispute Settlement (ISDS) protections in NAFTA, which we believe are indispensable to maintaining our growing energy sector. For decades, U.S. trade and investment provide for neutral arbitration to resolve investment disputes. These ISDS procedures ensure that other countries treat U.S. investors fairly. ISDS upholds the same fundamental due process and private property guarantees protected by our Constitution, and it obligates other countries to uphold these precepts as well. Attempts to eliminate or weaken ISDS will harm American business and workers and, as a consequence, will undermine business community support for the NAFTA modernization negotiations. It is also worth pointing out that the United States has never lost an ISDS dispute.

The robust energy trade among the United States, Canada, and Mexico that exists under NAFTA inevitably would be a casualty of withdrawal, threatening the "Energy Dominance" that is the core the of the Trump Administration's energy policy. This is just one example of the high-level stakes in these negotiations.

Given all of this, it is our strongest recommendation that if NAFTA modernization cannot be reached, the administration must retain its commitment to the current trade agreement.

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[8] ImpactECON. 2017. *Reversing NAFTA: A Supply Chain Perspective*. Available at: https://impactecon.com/wp-content/uploads/2017/02/NAFTA-Festschrift-Paper-1.pdf.

[9] John Murphey. 2017. "Which States Would Be Hit Hardest by Withdrawing from NAFTA?"U.S. Chamber of Commerce. Available at: https://www.uschamber.com/above-the-fold/which-states-would-be-hit-hardest-withdrawing-nafta.

Karen Alderman Harbert

President & Chief Executive Officer

Karen Alderman Harbert is president and chief executive officer of the U.S. Chamber of Commerce's Global Energy Institute. Harbert leads the Institute's efforts to build support for meaningful energy action nationally and internationally through policy development, education, and advocacy.

Under Harbert's leadership, the Global Energy Institute—previously known as the Institute for 21st Century Energy-- has evolved into a premier national and international organization dedicated to advancing a constructive energy agenda with the business community, policymakers, and consumers. The Institute celebrated its 10th anniversary in 2017 and has an ambitious program for the next decade.

The Institute has attracted grassroots advocates across the nation supporting its efforts to capitalize on America's tremendous energy promise. The Institute also regularly contributes policy analysis and research, including the groundbreaking Index of Energy Security Risk and the International Index of Energy Security Risk, the first tools to quantify America's energy security on an annual basis, as well as the comprehensive Energy Works for US platform, which provided policy recommendations to secure our nation's energy future.

Harbert frequently testifies in front of Congress and provides analysis to the media, policymakers, and industry leaders. She is an appointed member of the National Petroleum Council, an industry advisory organization that advises the Secretary of Energy on issues related to the oil and gas industries.

Harbert is the former assistant secretary for policy and international affairs at the U.S. Department of Energy (DOE). She was the primary policy adviser to the secretary of energy and to the department on domestic and international energy issues. She negotiated and managed bilateral and multilateral agreements with other countries and also served as vice chairman of the International Energy Agency, which advises its 28 member nations on energy policy issues and orchestrates international responses to energy supply disruptions.

Prior to joining the DOE, Harbert was deputy assistant administrator for Latin America and the Caribbean at the U.S. Agency for International Development (USAID). She had oversight of programs in 11 countries, totaling more than $800 million and 1,000 employees. In the private sector, Harbert worked for a developer of international infrastructure and power projects valued at more than $9 billion in countries in the Middle East, Asia, and Latin America.

Harbert gained experience on issues associated with economic reform and privatization through earlier positions at the USAID, the Organization of American States, and the International Republican Institute. She received a degree in international policy studies and political science from Rice University in Houston, Texas.

Harbert resides in Washington, D.C., with her husband and two children.

See more at: https://www.globalenergyinstitute.org/karen-alderman-harbert

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The mission of the U.S. Chamber of Commerce's Global Energy Institute is to unify policymakers, regulators, business leaders, and the American public behind a common sense energy strategy to help keep America secure, prosperous, and clean. Through policy development, education, and advocacy, the Institute is building support for meaningful action at the local, state, national, and international levels.

The U.S. Chamber of Commerce is the world's largest business federation representing the interests of more than 3 million businesses of all sizes, sectors, and regions, as well as state and local chambers and industry associations.

Mr. UPTON. Thank you.
Mr. Thompson.

STATEMENT OF CHET THOMPSON

Mr. THOMPSON. Good morning, everyone. Thank you, Chairman Upton, Ranking Member Rush, and the rest of the subcommittee members for the opportunity to testify today.

My name is Chet Thompson. I am the president of American Fuel and Petrochemical Manufacturers. AFPM represents 97 percent of the Nation's refining and petrochemical manufacturing capacity, including 118 refineries, 248 petrochemical facilities in 33 States.

We support more than 3 million jobs and add approximately $600 billion each year to the U.S. economy. Our members make the gasoline, the diesel, the jet fuel, and the petrochemicals that make our modern way of life possible.

We are the world's largest refining industry today and a global leader in petrochemical production, making us the backbone of global manufacturing and transportation.

Our energy trade relationships with Canada and Mexico are critical to enhancing our position. I would like to expand on only a few points in my written testimony.

First, Canada and Mexico are helping us achieve North American energy security. Although U.S. crude production has increased dramatically over the last, you know, decade or so, our refineries still import on average 8 million barrels a day of crude.

Canada and Mexico combined supply nearly half of this volume. In fact, Canada is the largest supplier of crude oil to the U.S., supplying more than 3 million barrels a day, or 41 percent of all of our imports.

We get more from Canada than all the other OPEC members combined. Mexico supplies 600,000 barrels a day. They're our fourth largest supplier, representing 7 percent. Not only do we import from our neighbors, but we also export a substantial amount of our energy, as well.

The U.S. exports nearly 5 million barrels per day of petroleum products. About a third of that goes to Canada and Mexico each year. Mexico is our largest export market for U.S.-refined products.

Last year, we exported approximately 14 billion gallons of petroleum products to Mexico. This helped meet more than half of their gasoline demand and contributed approximately $11 billion of energy trade surplus—surplus—with Mexico.

Likewise, we exported almost 9 billion gallons to Canada. Together, exports to Canada and Mexico have grown from essentially zero before NAFTA to more than 1.4 million barrels per day.

That's about 7 percent of our total refining production and about a third of our exports just to those two countries alone.

As a result of our increased energy production and the increasingly integrated North American energy market, the IEA now projects that North America will be energy secure by 2020.

This is good for our country, and it's good for the American consumer. We also export a substantial volume of chemicals to both Mexico and Canada. Trade in all chemicals has more than tripled

over the last two decades, from approximately $20 billion in 1994 to $63 billion in 2014.

My second point: North American trade is growing our economy. Our relationships with Canada and Mexico have made our energy industry strong, and that strength has attracted more investment.

Indeed, right now there is more than $185 billion in the queue for further investments in our refining and petrochemical industries.

With that investment comes the need for more employment and a strong work force. Demand for skilled labor positions is expected to grow by 12 percent by 2024. We will hire additional skilled labor to work as welders, electricians, pipefitters, boilermakers, and many other positions.

Changes in the global energy market, advances in technology, and legal reforms will provide further opportunities for U.S. companies. For example, the opening of the Mexican energy sector has allowed us to compete and sell our products in Mexico, leading to billions of dollars of investment by U.S. companies.

My last point I would like to make is that AFPM fully supports NAFTA and believes it helps achieve energy security. North American energy security is the result of our plentiful natural resources that we are blessed with, the ingenuity of our energy sector, but also NAFTA. NAFTA has played a very important role in our growth.

Thus, we support the continuation of NAFTA but think the agreement should be modernized. For example, NAFTA's investment protection should be strengthened consistent with other more recent U.S. free trade agreements, or at the very least, investor protections must be maintained.

Second, NAFTA should help increase regulatory coordination in cross-border energy infrastructure.

Finally, NAFTA customs procedures should be streamlined and modernized to reflect the way that energy and petrochemical trading occurs today across our borders.

So, again, I appreciate the opportunity to be here and look forward to answering your questions.

Thank you.

[The statement of Mr. Thompson follows:]

AFPM
American
Fuel & Petrochemical
Manufacturers

House Committee on Energy and Commerce, Subcommittee on Energy

Hearing entitled "The Impacts and Future of North American Energy Trade"

Testimony of Chet Thompson, President and CEO, American Fuel & Petrochemical Manufacturers

December 13, 2017

The American Fuel & Petrochemical Manufacturers ("AFPM") appreciates the opportunity to provide testimony on the impacts and future of North American Energy Trade. AFPM is proud to represent 97 percent of the nation's refining and petrochemical manufacturing capacity, including 118 refineries and 248 petrochemical manufacturing facilities. Our members make the gasoline, diesel, jet fuel, and petrochemicals that make modern life possible. The refining and petrochemical industries support more than 3 million U.S. jobs and add $568 billion each year to the U.S. economy. In the next decade, the refining and petrochemical industries will need additional skilled labor to work as welders, electricians, pipefitters, boiler makers, and in other similar positions. In fact, demand for these skilled labor positions is expected to grow by 12 percent by 2024 to support the more than $185 billion in committed investment in our industries.

North American energy trade is a key element for continued growth in U.S. refining and petrochemical manufacturing. The United States imports significant volumes of crude oil from Canada and Mexico and exports substantial volumes of refined petroleum products and petrochemicals to those countries. World demand for gasoline, diesel fuel, and other petroleum products continues to increase and will provide further opportunity for growth in U.S. exports of transportation fuels from our refineries. Likewise, Canada and Mexico are also key trading partners for petrochemicals.

Cross-border trade of energy and petrochemical products between the United States, Mexico, and Canada has enhanced market access and bolstered the competitiveness of our domestic refining and petrochemical industries. Canada is the United States' largest energy trading partner and Mexico is the United States' second largest energy trading partner.

In 2016 the U.S. imported $53 billion worth of energy products from Canada and exported $14 billion worth of energy products to Canada. Mexico is the largest export market for refined products manufactured in the United States, with energy products accounting for almost 20 percent of trade with Mexico. In 2016, the U.S. exported $20.2 billion worth of energy products to Mexico and imported $8.7 billion worth of energy products. Energy is a NAFTA success story and is poised to become even more important in the decades to come. AFPM supports the continuation of a strong NAFTA and urges Congress to build on its success by aligning policies to better facilitate the construction of modern infrastructure.

I. North American Trade in Energy and Petrochemicals is Significant and Growing

North American trade in energy and petrochemicals plays an integral role in securing and preserving energy security and economic growth for the United States as well as for our trading partners, Canada and Mexico. Bilateral energy trade between the United States, Canada and Mexico centers largely on crude oil, refined products, and natural gas.

Crude Oil. The North American supply of crude oil is vital for U.S. energy, economic, and national security. Canada and Mexico combined to supply 48 percent of the U.S. imported crude supply needs in

2016. More specifically, in 2016, the U.S. imported 3.3 million barrels of Canadian crude oil per day, making Canada the largest supplier of imported crude oil to the U.S., representing 41 percent of U.S. crude oil imports. Similarly, the U.S. imported 582,000 barrels of crude oil per day from Mexico, making Mexico the fourth largest source of imported crude oil, representing 7 percent of U.S. crude oil imports.

Petroleum products. In 2016, the U.S. exported 4.7 million barrels per day of refined petroleum products, and one-third of those exports went to Canada and Mexico. Products include transportation fuels such as gasoline, diesel, and jet fuel, as well as heating oil, and other products such as naphtha, a petrochemical feedstock, propane that is used for heating and cooking, and light oils used to dilute heavy crude oils, which both Canada and Mexico produce.

Both Canada and Mexico are vital markets for U.S. refined products. Mexico is the single largest export market for the U.S. refining industry; in 2016, almost 20 percent of U.S. petroleum product exports were delivered to Mexico. In fact, U.S. exports of gasoline to Mexico supplied more than half of Mexico's gasoline demand in 2016.

Bilateral trade of refined products between the United States and Canada is relatively balanced in both volume and value. For 2016 the United States exported 564,000 barrels of refined products per day to Canada, valued at $8.2 billion and constituting 12 percent of all product exports. Additionally, in 2016, the United States imported 542,000 barrels of refined product, which included 180,000 barrels per day of gasoline (2.8 billion gallons for the year) and 104,000 barrels per day of diesel fuel and heating oil (1.6 billion gallons for the year) from Canada. The Northeastern United States especially relies on gasoline, heating oil and diesel fuel from refineries in Eastern Canada.

Natural Gas. Natural Gas trade between the United States and Canada is dominated by pipeline shipments. In 2016, natural gas imports from Canada averaged 8.0 billion cubic feet per day (Bcf/d) (equaling 97 percent of all U.S. natural gas imports), and U.S. natural gas exports to Canada averaged 2.1 Bcf/d, (equaling 33 percent of all U.S. natural gas exports). Most U.S. imports of natural gas from Canada originate in Western Canada and are shipped to U.S. markets in the West, Midwest, and Northeast. U.S. natural gas exports to Canada originate primarily in Michigan and New York, and exploration of the Marcellus and Utica shales have increased U.S. production of natural gas.

Mexico is the U.S.'s largest recipient of natural gas exports. U.S. exports of natural gas to Mexico have increased dramatically as U.S. production of natural gas has increased. In 2016, U.S. exports of natural gas to Mexico totaled nearly 4 Bcf/d (equaling 60% of total U.S. natural gas exports) and are expected to increase in 2017 as pipeline infrastructure expands. Natural gas pipelines currently under construction or in the planning stages are expected to double the pipeline natural gas exporting capacity from the U.S. to Mexico in the coming years. The U.S imports very small volumes of natural gas from Mexico into Southern California and Texas.

U.S. natural gas trade with Mexico and Canada is vitally important to balancing U.S. natural gas demand and supply. In 2016, the U.S. consumed more than 75 Bcf/day of natural gas, more than 10 percent of which was imported from Canada and Mexico.

Petrochemicals. In total, trade in all chemicals, including substances outside of the petrochemical portfolio, many of which are made from petrochemical building blocks, has more than tripled over the last two decades from $20 billion in 1994 to $63 billion in 2014. Petrochemical imports from Canada and

Mexico totaled around $419 million in customs value, while exports to both countries totaled around $749 million in customs value. As mentioned above, there is a very diverse portfolio of petrochemicals crossing the border that affects a wide variety of different manufacturing supply chains throughout North America. Those supply chains often go back and forth across borders, blurring the distinction of purely American, Canadian or Mexican manufacturing and creating a North American manufacturing bloc.

II. North American Trade in Energy and Petrochemicals Enhances the Competitiveness of U.S. Fuel and Petrochemical Manufacturers

North American energy trade has led to significant and innovative changes in the energy and petrochemical sectors of the U.S., Canada, and Mexico. Innovation and technology have increased crude oil production in the U.S., leading to the lifting of the U.S. ban on crude oil exports in 2015. Likewise, in 2013, Mexico changed its constitution to begin liberalizing its energy sector, allowing for direct investment by foreign companies for the first time.

As a result of increased energy production and the increasingly integrated North American energy market, the International Energy Agency (IEA) now projects that North America will be energy secure by 2020. North American energy security reduces U.S. reliance on unstable and volatile sources of energy, benefiting U.S. national security. Continued cross-border energy trade will only add to the increases in productivity and innovation that has played out the last two decades.

With the liberalization of the Mexican energy sector, significant investments are now being directed from the U.S. into the Mexican energy infrastructure. For example, Andeavor, formerly Tesoro Corporation, was recently awarded a contract to lease storage and pipeline capacity in northwestern Mexico from Mexico's state-run oil and gas company Pemex. Andeavor will supply refined products produced from their U.S. West Coast refineries to consumers in Mexico, providing an important market for U.S.-produced refined products.

Andeavor is currently the first company to integrate sales of U.S. manufactured fuel at U.S. branded (ARCO) stores in Mexico. Andeavor has seen sales volumes at these stores exceed expectations. By 2020, Andeavor projects sales of 30,000 barrels per day in Baja California and Sonora, and the potential for an additional 20,000 barrels of sales per day in Chihuahua, Sinaloa and Baja Sur.

Likewise, Valero Energy Corporation and Exxon Mobil recently announced hundreds of millions of dollars in investment in fuels logistics, product inventories, and marketing in Mexico. Exxon has said the company plans to invest $300 million over the next decade and is opening the first series of Mobil-brand stations in Mexico this year. Similarly, BP launched its first Mexican service station in March of 2017 with plans to have 1,500 in operation over the next five years.

In August, Valero Energy Corporation signed a long-term supply agreement with IENova to supply gasoline, diesel and jet fuel to terminals operated by IENova at the Port of Veracruz on the Gulf of Mexico and inland in Puebla and Mexico City. Supply to the terminal at the Port of Veracruz will begin in 2018 with products moving inland by rail through a separate, long-term Valero agreement with rail operator Ferromax. The Puebla terminal and Mexico City terminal is scheduled to begin operating in early 2019. These investments will provide an important and growing market for U.S. refined products.

III. Future Opportunities for Growth and Investment Presented by North American Trade in Energy and Petrochemicals

In addition to the current economic benefits of cross-border energy trade, opportunities for sustained trade benefits as well as future growth and investment between the United States, Canada and Mexico will continue.

Exports to Canada of natural gas and other refined products will remain strong thanks in part to investments in energy infrastructure, primarily cross-border pipelines. Additionally, Mexican demand for U.S. exports of natural gas has grown and is expected to continue trending upward through 2030.

In Mexico natural gas is the country's largest source of electricity generation, accounting for 54 percent of the country's generation in 2015, up from 34 percent in 2005. According to Mexico's national energy minister (SENER), more than 60% of Mexico's electric capacity additions between 2016 and 2020 are projected to come from natural gas-fired power plants, and significant natural gas capacity additions are expected to continue through 2029. SENER projects natural gas-fired capacity will account for 24.9 gigawatts (GW) of total capacity additions from 2016 to 2029, with 14.7 GW of new gas-fired capacity coming online by 2020.

New natural-gas fired plants will increase Mexico's natural gas demand, specifically a projected increase from the power generation sector from 3.6 billion cubic feet per day (Bcf/d) in 2015 to 5.4 Bcf/d in 2029. This expected demand growth will be met primarily by increasing imports of natural gas from the United States and by large expansions of both cross-border U.S.-Mexico pipeline capacity and Mexico's domestic natural gas pipeline networks.

In 2017 and 2018, natural gas pipelines currently under construction or in the planning stages are expected to nearly double the pipeline natural gas exporting capacity from the United States to Mexico. The expansion of U.S. pipeline export capacity to Mexico has been matched by a five-year plan to expand Mexico's domestic pipeline network, which includes 12 additional pipelines with a total capacity of 9.7 Bcf/d currently in development. The plan will expand existing networks and add more than 3,200 miles of new pipeline through Mexico that will create new markets for natural gas in currently supply-constrained regions.

IV. Recommendations

An increasingly integrated North American energy market is a win for the U.S. refining and petrochemical industries, the environment, and energy consumers. Strong trade relationships between the United States, Canada and Mexico have led to reduced costs on key imported energy products, robust export markets in Canada and Mexico, and expanded market access. This in turn has allowed for greater industry investment and job growth, affordable energy costs and increased global competitiveness.

AFPM recommends that the U.S. build on these successes by enhancing and modernizing the North Atlantic Free Trade Agreement (NAFTA) to reflect the realities of an integrated North American energy market. In particular, such policies should promote a more harmonized and efficient regulatory environment, provide certainty for businesses and the public, and enhance and protect foreign direct investment in partner nations.

Finally, AFPM recommends the United States work with Canada and Mexico to ensure policies encourage the development of modern infrastructure to safely and efficiently move our products across the borders and further strengthen our integrated energy markets. Taken together, a strong trade and regulatory policy will ensure the U.S. and our neighbors are prepared to meet energy challenges for decades to come.

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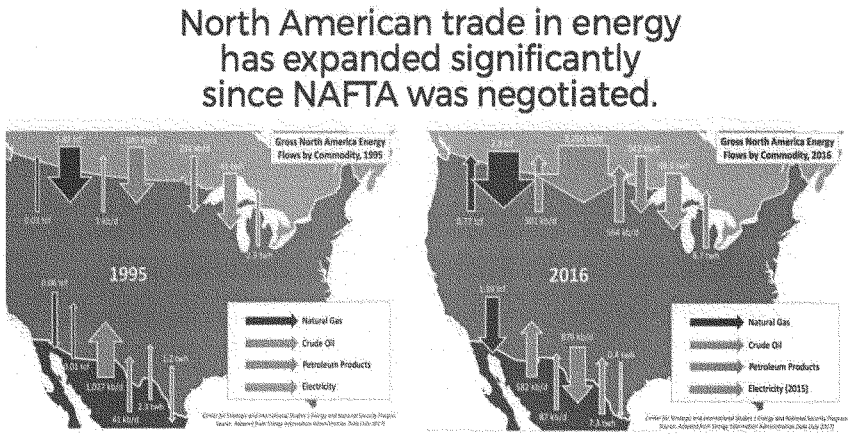
Appendix A – Center for Strategic & International Studies North American Energy Trade Expansion from 1995 to 2016



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Appendix B – Import and Export Energy Trade Data

Thousands of Barrels per Day	2016 US Exports to Canada	2016 US Exports to Mexico
Crude Oil	359	1
Crude Diluent (Pentanes Plus)	199	1
LPGs (Propane, Butane)	91	119
Gasoline-Finished & Blending Components	60	404
Diesel Fuel & Heating Oil	34	183
Kerosene/Kerosene Jet	44	33
Residual Fuel Oil	32	31
Petroleum Coke	23	51
Other Miscellaneous Products *	93	58
Total Product Exports	**576**	**880**

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Thousands of Barrels per Day	2016 Imports from Canada	2016 Imports from Mexico
Crude Oil	**3,227**	**582**
Crude Diluent (Pentanes Plus)	1	10
LPGs (Propane, Butane)	160	1
Gasoline-Finished & Blending Components	179	9
Diesel Fuel & Heating Oil	104	1
Kerosene/Kerosene Jet	9	
Residual Fuel Oil	38	52
Petroleum Coke	2	
Biomass Based Diesel	7	
Other Miscellaneous Products	53	14
Total Products	**553**	**87**

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Testimony Summary for Chet Thompson, AFPM President and CEO

Preserving and fostering North American cross-border energy trade is key to continued economic growth for the nation's refining and petrochemical manufacturing industries.

The United States imports significant volumes of crude oil from Canada and Mexico while exporting substantial volumes of refined petroleum products and petrochemicals to those countries. Canada and Mexico are also key trading partners for petrochemicals. Canada is the United States' largest energy trading partner and Mexico is the United States' second largest energy trading partner.

In 2016 the U.S. imported $53 billion worth of energy products from Canada and exported $14 billion worth of energy products to Canada. Mexico is the largest export market for refined products manufactured in the United States. In 2016, the U.S. exported $20.2 billion worth of energy products to Mexico and imported $8.7 billion worth of energy products. Preserving and fostering North American energy trade is key to maintaining and increasing economic growth for the nation's refining and petrochemical industries which support over 3 million U.S. jobs and add $568 billion each year to the U.S. economy.

North American trade in energy and petrochemicals is substantial and plays an integral role in securing and preserving energy security and economy growth for the U.S. as well as for our trading partners.

Bilateral trade between the United States, Canada and Mexico centers on crude oil, refined products, and natural gas. Supplies of crude oil foster domestic economic growth, while exports of petroleum products and natural gas trade drives investment by U.S. companies in jobs and energy infrastructure. The North American supply of crude oil is integral for U.S. energy, economic, and national security. Canada and Mexico combined to supply 48 percent of the U.S. imported crude supply needs in 2016.

Both Canada and Mexico are also vital markets for U.S. refined product exports. In 2016 the U.S. exported 4.7 million barrels per day of refined petroleum products, with one-third of those exports going to Canada and Mexico. Mexico represents the single largest export market for the U.S. refining industry. In 2016 Mexico received almost 20 percent of U.S. petroleum product exports while 12 percent of all U.S. refined product exports went to Canada.

U.S. natural gas trade with Mexico and Canada is extremely important to balancing U.S. natural gas demand and supply. Mexico is the U.S.'s largest recipient of natural gas exports, and in 2016 U.S. exports of natural gas to Mexico represented 60 percent of total U.S. natural gas exports.
In 2016 imports of natural gas from Canada equaled 97 percent of all U.S. natural gas imports, while U.S. natural gas exports to Canada amounted to 33 percent of all U.S. natural gas exports

Additionally, trade in all chemicals, including substances outside of the petrochemical portfolio, many of which are made from petrochemical building blocks, has more than tripled over the last two decades from $20 billion in 1994 to $63 billion in 2014.

North American energy trade has enhanced the competitiveness of the U.S. refining and petrochemical manufacturing industries, and provides future opportunities for economic growth.

North American trade of energy and petrochemical products has led to innovative changes and growth in the energy and petrochemical sectors of the United States, Mexico, and Canada. Cross-border market access has also bolstered the competitiveness of our domestic refining and petrochemical industries.

As a result of Increased energy production and the increasingly integrated North American energy market, the International Energy Agency (IEA) now projects North America will be energy secure by 2020, which will reduce U.S. reliance on unstable volatile sources of energy.

Recent developments such as the liberalization of the Mexican energy sector has led to increased investments from the U.S. in the Mexican energy infrastructure. These investments will provide an important and growing market for U.S. refined products.

For example, companies such as Andeavor, Valero Energy Corporation and Exxon Mobil have announced hundreds of millions of dollars in investments in Mexico. This year Andeavor has integrated sales of U.S. manufactured fuel at their U.S. branded (ARCO) stores in Mexico and Exxon is opening the first series of Mobil-brand stations in Mexico. Additionally, Valero has signed a long-term agreement with IENova to supply transportation fuels to terminals at the Port of Veracruz and inland in Puebla and Mexico City.

Finally, U.S. support for policies that preserve and grow North American energy trade is key to fostering continued and expanded economic growth, investment and energy security.

North American energy trade plays an integral role in securing and preserving energy security and economic growth for the United States as well as our trading partners, Canada and Mexico. The strong relationships the United States has developed with Canada and Mexico have allowed us to become an international energy power house and have armed us with the necessary abilities to beat out foreign competitors in the global markets such as China.

As a result of an increasingly integrated North American energy market, the U.S. enjoys reduced costs on key imported energy products such as crude oil, as well as billions in annual domestic export revenues. The growth of energy infrastructure from the U.S. into Canada and Mexico has allowed for expanded market access for U.S. companies, greater investment, job growth and affordable energy costs for consumers.

Policies that could upend the existing integrated North American energy market could greatly increase the costs of U.S. imports of key energy products from Canada and Mexico, driving up costs for energy consumers and impacting job growth and investment. Furthermore, changes to cross-border trade policy would threaten the U.S.'s role in Canadian and Mexican energy export markets which could in turn allow for foreign competitors such as China to move into those markets.

Lastly, the International Energy Agency (IEA) projects that North America will be energy secure by 2020, a key policy objective highlighted by the current Administration. However, reductions in the ability of energy products to trade between the United States, Canada, and Mexico could compromise this historic milestone.

Therefore, we urge that the U.S. support policies that facilitate the building of a modern North American energy infrastructure, allow energy markets to grow through enhanced regulatory cooperation, and protect and preserve U.S. investments in partner nations.

Mr. UPTON. Thank you.
Dr. Krupnick.

STATEMENT OF ALAN KRUPNICK

Dr. KRUPNICK. Mr. Chairman, Ranking Member, and other members of this subcommittee, thank you for inviting me to speak today about energy trade with our Mexican and Canadian neighbors.

I come before you as an economist, a senior fellow, and leader of the North American Energy Initiative at Resources for the Future.

RFF's mission is to improve environmental, energy, and natural resource decisions through impartial economic research and policy engagement. RFF is nonadvocacy and does not take positions on issues, so these opinions are mine.

Today, I am here to advocate for greater harmonization and integration of energy markets and economic and environmental policies across the three countries, and I am very happy to hear the words today "harmonization" and "integration" across the aisle at this hearing from the Members. That's great.

So, with appropriate policies and agreements with our neighbors, North American can be the world's energy powerhouse. Free trade in energy and electricity promises greater economic prosperity, a cleaner environment, and greater energy security in all three countries.

These countries have been moving towards harmonization in these sectors for years now. On the economic front, the Mexican energy reforms opened up oil and gas leasing and exploitation to U.S. companies. The reforms also expanded markets for our pipelines, generation technology, and natural gas.

Mexico continues to greatly increase natural gas imports from the U.S. to replace oil fire generation. This development will reduce electricity generation costs, lower air pollution emissions from power plants, and increase energy security for Mexico, which is a good thing.

And U.S. producers have access to a large market for their natural gas. If, however, NAFTA negotiations go badly or if political interference in this trade occurs, we could see increased costs and delays in exporting gas.

We might even run the risk of Mexico eventually turning away from the U.S. as a supplier, and we certainly wouldn't want that for American producers or Mexican consumers.

The electricity sector, likewise, can benefit from increased integration. We have found the cross-border interconnections and capacity planning occur less frequently than they should to maximize electricity reliability.

On the environmental front, as was mentioned, during the Obama administration the U.S. became party to several tripartite agreements to improve energy efficiency, reduce methane emissions, work towards major CO_2 reductions.

These gains are being reversed by the Trump administration even as Canada and Mexico continue to solidify their policies to reduce greenhouse gases.

Canada has implemented a national carbon price for provinces that do not already have a price for trading system. Mexico, along with its limited carbon tax, is in the process of implementing a

pilot cap and trade program, and joining California and some Canadian provinces in that.

So, what can be done in general and specifically by Congress to realize the benefits of greater harmonization? First, the bill that you have introduced is a great start, and be vocal in supporting free energy trade and investment protections already in NAFTA. Be wary of unintended consequences of NAFTA failing.

Second, remember that as the U.S. continues to roll back climate regulations such as its methane rules, our neighbors may grow increasingly concerned about competitiveness issues.

Mexico and Canada may likewise become hesitant in efforts to align environmental policies in the future, limiting our opportunities that might improve environmental outcomes at lower cost to the private sector and consumers here in the United States.

Third, Congress can support past and future efforts to align economic, environmental, and safety regulations for offshore drilling in the Gulf of Mexico. There is already an agreement to build upon, and DOI has worked closely with Mexican regulators to share best practices and align offshore safety regulations. Such work should continue so that we can ensure successful and responsible offshore drilling.

Fourth, Congress can help promote, along with our neighbors' counterparts, the vision of renewable capacity growth in areas that capture their locational advantages—for instance, solar in Mexico, hydro in Canada—for selling into an integrated North American grid.

Lastly, Congress can work to further improve the U.S. infrastructure siting and permitting process. Pipelines, transmission lines are needed to execute this vision of a North America system.

Streamlining and strengthening this process can occur while improving environmental social outcomes, for example, by using cost benefit analysis in permitting decisions.

As our two neighbors are likewise facing similar challenges in this area, we should aim to share best practice.

So, ultimately, the fates of the Mexican-Canadian-U.S. energy sectors are intertwined. The interdependence actually benefits the three countries, increases our joint energy security.

Congress can play an important role in seeing this vision become a reality.

Thank you.

[The statement of Dr. Krupnick follows:]

TESTIMONY OF ALAN KRUPNICK, PhD
SENIOR FELLOW, RESOURCES FOR THE FUTURE
BEFORE THE ENERGY SUBCOMMITTEE OF THE
HOUSE COMMITTEE ON ENERGY AND COMMERCE

Panel: North American Energy Trade: Benefits and Opportunities for Improvement

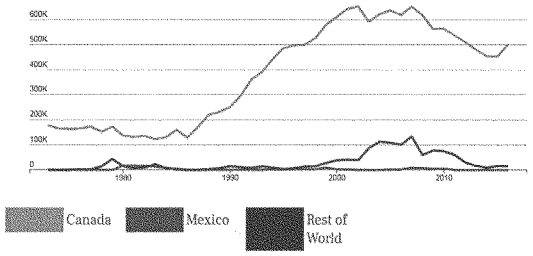
DECEMBER 13, 2017

INTRODUCTION

Canada, Mexico, and the United States have some of the most significant fossil energy resources in the world, both individually and even more so collectively. With technological advancements in unconventional gas and oil development, oil sands production, and offshore drilling, North America can be the new world energy powerhouse. As North American production has grown, so has the interconnectedness among the three countries' energy sectors—a change that has benefitted the three countries greatly in terms of environmental outcomes, economic outcomes, energy security, and more. Energy trade and regulatory alignment have allowed the three countries to reduce their dependency on energy from other regions, reduce energy and electricity costs, and affordably mitigate environmental impacts.

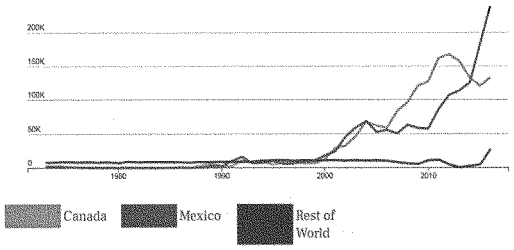
Figures 1 and 2 (illustrating US trade in natural gas with its neighbors to the north and south) give a snapshot of these connections. The US exports almost all of its natural gas exports to Mexico and Canada, while Mexican and Canadian crude oil has increasingly replaced US imports from other countries throughout the past two decades (Figure 3; note that the scale of volume differs across the three figures).

Figure 1. US Natural Gas Imports, 1973–2016



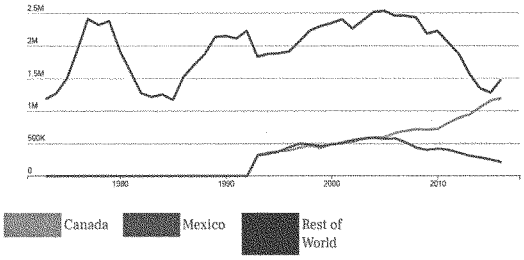
Note: Import volumes in MBOE (one thousand barrels of oil equivalent). Data from the US Energy Information Administration.

Figure 2. US Natural Gas Exports, 1973–2016



Note: Import volumes in MBOE (one thousand barrels of oil equivalent). Data from the US Energy Information Administration.

Figure 3. US Crude Oil Imports, 1973–2016



Note: Import volumes in MBOE (one thousand barrels of oil equivalent). Data from the US Energy Information Administration.

While private energy and capital markets throughout North America will drive the development of expanded continental energy and trade, there is a substantive role to be played by governments. Coordinated policies can effectively foster economic growth, technological development, and environmental protection, while meeting the political needs of each country. A more purposeful and formalized North American energy strategy would serve to shape a shared vision of the areas where government policy can effectively be deployed to coordinate infrastructure development and project financing; reduce barriers to trade, investment, and technology; and develop harmonized approaches to reducing continent-wide greenhouse gas emissions.

President Trump's commitment to become energy independent from "the OPEC [Organization of Petroleum Exporting Countries] cartel and any nations hostile to our interests" can also be seen as an opportunity for greater North American cooperation on energy of all types, which entails a buildout of transportation and infrastructure and provides incentives to

cooperate on environmental protection and safety.[1] These opportunities are particularly relevant in light of a number of changes taking place in North American energy production and consumption. Some estimates have North America becoming self-sufficient, in that the countries will produce more liquid fuels than they consume, by 2020.[2] Given the shale boom, the United States will become a net energy exporter, possibly by 2026, although Canada will likely continue to be a major oil supplier for the United States, which imports oil on net. Mexico became a net importer of hydrocarbons in the second half of 2015, becoming particularly dependent on the United States for natural gas and diesel.[3] Although Mexico's energy reform seeks to close this deficit in the long run, the country will remain dependent on these imports for the foreseeable future.

The three countries are positioned to further benefit from continued interconnectedness and coordination efforts in the energy and electricity sectors. With renegotiation of the North American Free Trade Agreement (NAFTA) underway, several opportunities exist to enhance trilateral, bilateral, and subnational energy-sector cooperation and policy alignment. Envision a world where the three North American countries act as a bloc to trade freely among themselves in all things energy, are regulated in a cost-effective and coordinated system—and rival every other nation or bloc in its ability to influence world markets for oil and gas. While an unlikely outcome given the current political context, the three countries have much to gain from increased cooperation and alignment.

With these potential gains in mind and before the 2016 presidential election, RFF and its partners in Canada – IISD – and Mexico – ITAM –and two host institutions, Boise State University and the University of New Mexico, with funding from DOE held a series of workshops to identify opportunities to harmonize economic and environmental policies affecting electricity supply and interconnections as well as oil and gas production and its trade. These workshops were attended by government officials from the three countries, industry, environmental groups, think tanks, and academic experts. A background paper on current oil and gas policies with workshop recommendations was produced,[4] and a report focusing on workshop recommendations for improving North American electricity is available as well.[5]

Below, we describe energy and electricity policy harmonization and its benefits. We then highlight four areas where significant harmonization has occurred and should occur in the future. Last, we provide some of the most relevant recommendations from our reports.

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[1] White House. 2017. "An America First Energy Plan." https://www.whitehouse.gov/america-firstenergy.
[2] American Petroleum Institute. 2017. "North American Energy."
http://www.api.org/~/media/Files/Policy/Trade/North-American-Energy-Onepager.pdf
[3] Lajous, Adrián. 2017. "Del oro negro al número rojo: La dependencia de las importaciones de hidrocarburos de México." *Nexos*, February 20. http://www.nexos.com.mx/?p=31468.
[4] Krupnick, Alan J., Amin Asadollahi, Juan Carlos Belausteguigoitia Rius, Kristin Hayes, Isabel Echarte, Philip Gass, and Daniella Echeverria. 2017. "North American Energy Integration: Assessing Oil and Gas Policy Issues ahead of NAFTA Renegotiation." RFF Report. http://www.rff.org/files/document/file/RFF-Rpt-NA%20Oil%20and%20Gas_NAFTA.pdf.
[5] Krupnick, Alan J., Daniel Shawhan, and Kristin Hayes. 2016. "Harmonizing the Electricity Sectors across North America: Recommendations and Action Items from Two RFF/US Department of Energy Workshops." http://www.rff.org/files/document/file/RFF-DP-16-07.pdf.

WHAT DOES HARMONIZATION MEAN?

In recent years the governments of Canada, the United States, and Mexico have increasingly worked toward harmonizing energy-related regulations (including many on environmental safety and climate change) across the North American continent. This harmonization – and we use this term in the broadest sense – has taken a number of forms, ranging from data and technology sharing to full-fledged planning and policy alignment, and has been driven by a desire to reduce regulatory complexity, foster additional cross-border transport of resources, address potential economic complications due to unaligned markets, and collaborate on shared objectives. Collaboration has been driven by a desire to address any potential economic and market barriers due to an unaligned market and a desire to collaborate on shared objectives, such as the announced intentions to work together on the implementation of the Paris Agreement and on a host of climate, energy efficiency, pollution, and natural resource issues.

Harmonization is beneficial if it facilitates a worthwhile activity, such as power generation or emissions reductions, occurring where it can be accomplished at the lowest cost. Linking emissions cap-and-trade programs, enabling the free flow of power, and equalizing the marginal tax rate on generation, for example, are harmonization actions that can result in mutual benefit. Harmonization is also advantageous if it reduces transaction costs. If regulatory requirements are sufficiently similar on both sides of a border, for instance, companies can use just one set of procedures for complying with them, saving the expense of having to follow two different sets of procedures. Finally, harmonization can be constructive if it takes the form of coordinated decision-making that makes additional options possible. Considering the integration of assets and markets on both sides of the border through coordinated decision-making enables market access and system efficiency gains. For example, deciding to meet a system's needs with a new transmission line from across the border instead of a new power plant is possible only with coordination and very tight regulatory arrangements. These factors can contribute to improved outcomes for the three countries, including energy security, lower private sector costs, lower costs to consumers, and improved environmental and social outcomes.

Many examples of harmonization already exist in North America. For instance, in 2014, the three countries signed a memorandum of understanding on the sharing of energy-related data and definition of terms.[6] The linked greenhouse gas cap-and-trade programs of California and Québec—soon to be joined by Ontario and Manitoba and discussions with Mexico ongoing—provide an example of broad policy integration. More complete policy harmonization is illustrated by Canadian automobile emissions and fuel economy policies, which mirror those of the United States in stringency over time, and railroad safety standards. Agreements for oil and gas extraction along the Mexico-US Gulf of Mexico border likewise expanded opportunities for offshore drilling for both countries.[7]

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[6] "Memorandum of Understanding among the Department of Energy of the United States of America and the Department of Natural Resources of Canada and the Ministry of Energy of the United Mexican States Concerning Climate Change and Energy Collaboration." http://www.nrcan.gc.ca/energy/international/nacei/18102.

[7] See U.S.-Mexico Transboundary Hydrocarbons Agreement.

THE BENEFITS OF HARMONIZING ENVIRONMENTAL POLICY

Over the past few years, Canada, Mexico, and the United States have cooperated on climate regulations in a number of ways, most notably through the commitments made in June 2016 as part of the North American Climate, Clean Energy, and Environment Partnership Action Plan,[8] which includes commitments to reduce methane emissions from the sector by 40–45 percent by 2025 and collaborate on implementation of the World Bank's Zero Routine Flaring by 2030 Initiative. Canada published its proposed methane regulations for the oil and gas sector earlier this year. And Mexico published regulations in 2016 for methane emissions in its upstream oil and gas operations, and addressed methane in recently published guidelines for unconventional oil and gas development. The U.S., however, has recently placed its attention on repealing its EPA and BLM methane regulations, though a number of oil and gas producing states have sought to regulate methane, including Colorado, California, Wyoming Utah, North Dakota, Ohio, and Pennsylvania, see the benefits of conserving this resource.

US environmental rollbacks under Trump impose a number of risks on these trade relationships and their benefits. Methane policies, for example, will be imposed in different jurisdictions (states, provinces, and nations) at different times, creating market distortions as some areas will not account for the externalities—in terms of lost gas resources and revenue as well as increased climate impacts. Without more harmonized policies, the three countries forgo the potential to decrease transaction costs. Furthermore, Mexico and Canada may be hesitant to pursue these aligned policies in the future, as the U.S. is unlikely to follow through. And the U.S. position, which has created competitiveness issues with its neighboring countries as they implement carbon pricing schemes and methane regulations, may strain trade relationships and spur pressure within Mexico and Canada to pursue more protectionist policies.

Progress on continental-scale GHG emissions policies will be slow in the absence of US climate leadership. That said, there is no indication that the governments of Canada and Mexico will back away from the Paris Agreement or carbon policies, such as the existing carbon pricing system in Mexico, the announced federal carbon price backstop in Canada, subnational carbon taxes and caps in Canadian provinces and some US states, and tighter fuel economy standards in all three countries.

POTENTIAL FOR IMPROVING INFRASTRUCTURE PLANNING AND SITING

The shale gas revolution increased US production from 18.1 trillion cubic feet (tcf) in 2005 to 24.4 tcf in 2013 and is expected to increase to 35.5 tcf by 2040, under the AEO2017 reference case. This growth turned the US from an expected major net importer of gas to a net exporter, and has led to a decrease in natural gas prices of about $2-4 per thousand cubic feet (mcf), against a price that would have been around $6-8 per mcf. Getting all this gas to market has required its own revolution in pipeline use and construction – a revolution still on-going. New energy infrastructure—including pipelines, transmission lines, and more—is fundamental

[8] White House. 2016. "North American Climate, Clean Energy, and Environment Partnership Action Plan." https://obamawhitehouse.archives.gov/the-press-office/2016/06/29/north-american-climate-clean-energy-and-environment-partnership-action.

to the efficient integration of North American energy markets so the three countries can each see the benefits of the fracking revolution.

Localized and grassroots opposition to new pipeline infrastructure, in all three countries, complicates the issue of permitting and siting of infrastructure. And though many have construed pipeline construction to be a jobs versus environment issue, public participation and environmental and social outcomes can be enhanced alongside the improvements to the permitting and siting process. In fact, some of the issues that lengthen the permitting process result in adverse environmental outcomes—in previous House hearings, experts have testified that the Environmental Impact Statement (EIS) process has increasingly served to prevent litigation—by leaving no "pebble unturned," conducting lengthy, unnecessary studies—rather than inform regulators and the public of actual environmental and health hazards of a project.[9] The result, as was argued at the hearing, is a costly and lengthy process for companies and a convoluted and confusing process for the public.

Decisions about new infrastructure, built both within countries and across borders, should furthermore include a role for cost-benefit analysis, examining how infrastructure plays into the emissions of greenhouse gases, improves system affordability and reliability of electricity, and affects the well-being of those directly impacted by construction. Risks associated with infrastructure include those to health and safety, the local environment, and climate change, as well as whether and how to make infrastructure more resilient to worsening weather patterns, cyberterrorism, and physical terrorism. Creating better metrics for reliability and resiliency are necessary components for solving these problems.

Potential exists for the three nations to strike a balance among these competing interests by not only providing certainty for industry and regulators—in terms of the length and breadth required for environmental impact statements—but also conducting consistent and thorough reviews to ensure that environmental and societal interests are adequately taken into account. The FAST 41 process is just one example of methods for streamlining federal and state infrastructure permitting processes without sacrificing (and while perhaps improving) social and environmental outcomes.[10] At minimum, Canada, Mexico, and the United States would benefit from learning from each other's best practices in this area, such as the U.S.'s FAST 41 process. In the longer term, coordinating policies regarding environmental impact statements and public input could improve outcomes while decreasing the regulatory burden on the oil and gas industry.

SAFELY AND ECONOMICALLY DEVELOPING OFFSHORE RESOURCES

Mexico and the U.S. have collaborated in recent years to improve the development of offshore energy resources in the Gulf of Mexico. The two countries have signed agreements that

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[9] *Oversight Hearing, "Modernizing NEPA for the 21st Century" before the House Committee on Natural Resources*, 115th Cong. (2017).

[10] In the Fixing America's Surface Transportation Act (FAST Act), a section (referred to as FAST 41) was devoted to streamlining the interagency process by creating a Permitting Council to coordinate permitting decisions across multiple federal agencies for selected major projects, including pipelines. The Permitting Council also plays an arbitration role where there are conflicts between agencies.

expand areas for drilling, have worked to jointly improve safety and align regulations, and have shared knowledge on regulating offshore oil and gas development.

The most prominent example of coordination and cooperation in this area is the US-Mexico Transboundary Hydrocarbons Agreement. A moratorium area existed—1.4 miles on each side of a 135- mile-long section of the maritime border—until the agreement became effective in order to prevent oil and gas development on one side of the border from affecting the other. If the host rock is sufficiently permeable, hydrocarbons can flow across political jurisdictions. In such a setting, extraction on one side of the border can adversely impact extraction on the other side. In the Gulf of Mexico, this is likely to occur. The agreement recognizes the possibility that a reservoir may exist across the continental shelf boundary in the Gulf of Mexico and establishes a framework for developing such resources cooperatively. The agreement encourages arrangements such as unitization agreements, under which the firms extracting from the pool—collectively referred to as the unit—all agree to have one party take charge of decisions regarding extraction by firms in the unit. Despite the perception that trade and policy coordination harms American businesses, the oil and gas industry has consistently proven that such relationships improve business opportunities.

The agreement furthermore spurred coordination between Mexico and the United States regarding offshore safety in the Gulf of Mexico following the US-Mexico Transboundary Hydrocarbons Agreement. This agreement, designed to promote responsible stewardship in the Gulf of Mexico, provides for joint inspection teams to ensure compliance with safety laws and regulations, as well as joint review of and approval for agreement governing exploration and development of transboundary reservoirs. Such coordination is key in ensuring the safe development of resources as well as lower transaction costs for companies that might choose to operate on both sides of the border.

ELECTRICITY

Electrically, Canada and the US are highly interconnected and highly integrated. Most of western Canada and the US share a synchronous grid, i.e. one where electricity flows freely across the border and is inherently interdependent. These interconnections have become essential to the US bordering states in terms of reliability and emissions, and there are still opportunities for improvement of the harmonization of electricity systems between Canada and the US. Mexico and the US are much less electrically interconnected and integrated. The Mexican and US grids are not synchronous, and there are fewer institutions and traditions of shared grid governance between Mexico and the US than there are between Canada and the US. However, there is potential for Mexico and the US to become much more electrically connected and integrated, in part as a result of Mexico's current electricity sector reforms and in part because of Mexico's location being conducive to efficient wind and solar power generation.

In the US and Canada, the control area operators[11] are typically either regional transmission organizations or large vertically integrated utilities elsewhere (NERC 2014). In the

[11] The grid that serves most of Canada, the US and Mexico consists of dozens of what can be called "control areas." Within each control area, an organization that can be called a "control area operator" or balancing authority decides how much power (real power) and voltage support (reactive power) each generator should provide at each moment in order to meet demand and maintain adequate reliability at approximately the minimum possible cost. However,

US, the California Independent System Operator is synchronously connected with northern Baja California. The Electric Reliability Council of Texas (ERCOT) and El Paso Electric are the other two US control area operators with high-voltage connections to Mexico. In Mexico, the control area operator is the Centro Nacional de Control de Energía (CENACE), which is now part of the Secretariat of Energy (SENER).

There are six kinds of harmonization required for minimizing the total cost of system operation: harmonization of operational decision-making, reliability processes, markets, taxes, transmission prices, and duties on electricity trade.

1) *Harmonization of operation decision-making.* Minimizing the combined generation costs across two or more control areas requires merging their operational decision-making because calculating the least expensive set of generators to use in each day, hour, and moment requires all of the generators (and other controllable elements of the grid) to be considered in the same optimization. This operational decision-making addresses not only the need for real power but also the needs for proper voltage, proper frequency, and crucially, reliability. The two international borders, so far, have impeded mergers of operational decision-making between the control areas on opposite sides of them. There have been no such mergers of decision-making for dispatch across either international border. In fact, current Canadian law prevents Canadian control area operators from participating in such mergers. A pair of neighboring control area operators that have not merged their operational decision-making can still reduce the combined costs of their operation by more closely coordinating it.
2) *Reliability Coordination.* Maximizing reliability requires coordination between control areas, including between those on different sides of the international borders. Coordination for reliability is similar to coordination for cost-minimization, but with more of a need for instant communication and instant coordinated action. One type of US-Canada reliability coordination that can be bolstered, according to the Canadian Electricity Association, is the sharing of information about natural and human-made threats to grid reliability (CEA 2014).
3) *Integration of Markets.* In order for operational decision-making of two control areas to be merged, some of their markets too must be merged.
4) *Harmonization of Taxes and Externality Charges.* Minimizing the combined generation costs also requires harmonizing the taxes and externality charges on generation. The taxes on generation include those on fuel and on generator profits. The externality charges on generation include those on health and environmental damage, that may be collected via an emission fee or a cap-and-trade program. The portion of taxes not based on externalities (income and fuel taxes), should be equal on the two sides of the border to minimize combined total cost.

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the control areas, even the ones on opposite sides of an international border, are connected with each other, either synchronously or asynchronously. This means that they can harmonize, even merge, their markets and operation. A higher degree of such harmonization can reduce total costs. It can reduce generation costs, the frequency and duration of costly reliability failures, and the total amount of costly generation capacity needed.

5) *Transmission Pricing.* The transmission price from any particular location on the grid to any other particular location on the grid should equal the difference in the locational marginal prices between those locations. In turn, the electricity price (locational marginal price) at each location on the grid should equal the current marginal cost of increasing the quantity of power supplied to that location. These prescriptions are standard because they induce generation to occur where it is least costly. However, the prescription for transmission pricing is often violated; additional transmission charges are imposed across some interfaces, particularly for flows that cross a boundary between adjacent control areas, including control areas in two different countries. This tends to increase the total cost of generation by causing higher-cost generators to be used in place of lower-cost generators.
6) *International Trade Duties.* International import or export duties on electricity are a special type of additional transmission charge. An example of such a charge is the Canadian Federal Goods and Services Tax that is imposed on imports of electricity from the US to Canada except if the electricity was originally sourced from Canada, is stored for example in a US hydropower reservoir, and then is reimported to Canada (Canada Customs and Revenue Agency 2002).

RECOMMENDATIONS AND ACTION ITEMS

Oil and Gas

Below we include a number of recommendations from our 2017 report that we believe may be relevant to Congress for strengthening North American energy trade and its benefits.[12] These recommendations stem from RFF research on North American energy issues as well as a 2016 workshop held at RFF. We include those we consider the most relevant for Congress to consider, though other recommendations were made in the report as well.

- *First, do no harm and maintain existing cooperation and coordination on energy trade and regulation.* Maintaining the progress the three countries have made will ensure continued success in North America's endeavor to become more energy secure.
- *Describe ways the three countries are already collaborating on energy and climate issues, and maintain all non-duplicative interactions.* Workshop participants were all aware of various information-sharing and collaborative forums across the United States, Canada, and Mexico, and subnational governments, but few, if any, participants (including the organizers) were aware of the full suite of conversations already taking place. Capturing this information in one place, and characterizing which collaborations are already happening in which venues, would be a valuable step toward understanding where the gaps are, which harmonization opportunities might need more conversation or structure and which, if anything, are already being addressed adequately. It bears saying that continuing these cooperative and collaborative interactions is important for each of the countries' economies and their environments

[12] Krupnick, Alan J., Amin Asadollahi, Juan Carlos Belausteguigoitia Rius, Kristin Hayes, Isabel Echarte, Philip Gass, and Daniella Echeverria. 2017. "North American Energy Integration: Assessing Oil and Gas Policy Issues ahead of NAFTA Renegotiation." RFF Report. http://www.rff.org/files/document/file/RFF-Rpt-NA%20Oil%20and%20Gas_NAFTA.pdf.

- *Define what constitutes a subsidy to the oil and gas sector, harmonize this definition among the three countries, and continue action to eliminate fossil fuel subsidies.* In June 2016 at the North American Leaders' Summit, the three countries agreed to end "inefficient" fossil fuel subsidies as part of G_ commitments. This work is difficult to move forward without clearer information about the types, costs, and performance of various subsidies, and generating this type of information is a seemingly necessary prerequisite for fulfilling this commitment.
- *Examine the extent to which infrastructure permitting processes are similar or differ across the three countries, specifically as this relates to environmental impact statements (EISs), with the longer term goal of harmonizing these processes to reduce regulatory costs and improve public participation.* These processes should be improved and better aligned to decrease transaction costs and delays, as well as to better address country and cross-border environmental and indigenous/First Nation concerns. These reviews should adopt consistent methods to account for the social cost of carbon.
- *Improve regulatory alignment and information sharing regarding methane emissions.* Workshop participants believed it is in the United States' interest to not only implement but expand its existing methane regulations. Regulatory certainty and alignment could help industry prepare and make appropriate technology and investment decisions. Governments can work together toward a common vision of reducing and eventually eliminating wasteful practices that vent or flare methane where it could be captured and sold. These aims create skilled labor opportunities while reducing the sector's environmental footprint.
- *Continue energy technology innovation exchanges such as on carbon capture utilization and storage (CCUS), methane measurements, and water-saving technologies. Leverage the three countries' investments through joint funding for research and development.* Improvements in technology can drive down both company and consumer costs. Joint funding would also go a long way toward decreasing the marginal cost of research and development, benefiting all three countries.
- *Provide Mexico with certainty regarding natural gas and oil products supply, and further policies that provide the three countries with increased energy and economic security.* The United States can maintain and perhaps expand its market for its energy products, while Mexico can ensure energy and electricity reliability affordably. North America as a whole would benefit from its increased energy independence from the rest of the world.

Electricity

The electricity workshop attendees highlighted a number of areas which might benefit from legislative attention. We include those we consider the most relevant for Congress or the Administration to consider, though other recommendations were made in the report as well.[13]

[13] Krupnick, Alan J., Daniel Shawhan, and Kristin Hayes. 2016. "Harmonizing the Electricity Sectors across North America: Recommendations and Action Items from Two RFF/US Department of Energy Workshops." http://www.rff.org/files/document/file/RFF-DP-16-07.pdf.

- Assess whether US permitting of proposed cross-border transmission infrastructure investments can be streamlined.
- Examine whether disagreements over cost allocation may prevent beneficial future cross-border infrastructure from being built. If so, attempt to establish a process for determining cost allocation that will prevent such disagreements. Calculating compensation for those who are likely to be hurt by such infrastructure could further improve the effectiveness of such a process.
- Improve and apply benefit-cost analysis methods and standards for potential new transmission lines and other investments that increase cross-border transmission capacity.
- Consider funding the building of a North American energy market and policy model that incorporates an electricity sector and a natural gas sector, at a minimum. Such a model would be useful for infrastructure planning, and to test the costs and benefits of various policy proposals. Data needs for such a model are high.
- Analyze the possibilities of Clean Air Act section 115 language for incorporating another country's damages and costs into US benefit-cost calculus for rulemaking purposes. Look for similar provisions in Mexico's and Canada's statutes.
- Align (or eliminate) federal permitting requirements for electricity exports.
- Consider reducing the restrictions on participation by US federal entities, such as the Bonneville Power Administration, in open, competitive markets. Reducing those restrictions could reduce total system-wide costs and, for entities near an international border, make cross-border flows more economically efficient. An impediment is that such participation could subject these entities to US Federal Energy Regulatory Commission (FERC) regulation that they may wish to avoid.
- Foster closer coordination of electricity system operation and planning. Closer cross-border coordination would provide cost reductions and reliability improvements. Some specific targets include wide-area planning, improved benefit-cost analysis, streamlined project approvals, and an agreed-upon method of calculating cost allocations. In addition, regulators could enable greater coordination by modifying incentives for utilities.
- Develop a continent-scale plan for facilitating renewables. To make renewables as efficient and desirable as possible, such a plan could examine the locational advantages of such systems on a North American scale, accounting for transmission and possibly habitat issues.
- Create a North American energy security blueprint. Such a blueprint could have an outside component (e.g., how a North American energy bloc would be advantageous from an energy security perspective). It should also have an internal component (e.g., examining the risks to Mexico from much greater reliance on US natural gas).

CONCLUSION

Individually and together, Canada, Mexico, and the United States have much to gain from increased energy policy harmonization and coordination—including on other infrastructure and climate issues, electricity coordination, offshore drilling, and more. The three countries ultimately would best be served by continued and strengthened collaboration on oil and gas development and electricity capacity and reliability planning and institution building, while

addressing environmental concerns. The ongoing NAFTA talks should aim, at the very least, to do no harm. But because the three countries stand to gain so much from strengthened coordination—including the potential for near-term energy independence—the United States should work to expand and improve on our existing successes in this area.

Existing relationships and the benefits they provide, however, are not a foregone conclusion, as the NAFTA re-negotiation process has highlighted. For example, trade with the United States may become an energy security issue for Mexico, as the country has come to rely more heavily on imports of natural gas and oil products (namely, gasoline) from the US. Without certainty from the United States regarding this supply, Mexico may seek to diversify its imports and increase production, decreasing the market for US energy in the long run. The United States would benefit by having a market for its energy products, and Mexico would benefit from reliable and cost-effective energy options. North America as a whole would benefit from its increased energy independence from the rest of the world.

As the US continues to roll back climate regulations, its neighbors may grow increasingly concerned about competitiveness issues, limiting potential future cooperation. Mexico and Canada may likewise become hesitant in efforts to align environmental policies—as the countries agreed to do regarding methane pollution—limiting opportunities that might improve environmental outcomes at lower costs to the private sector and consumers.

Despite the Trump administration's actions and rhetoric, as well as related uncertainties about trade and hemispheric cooperation, a number of economic realities are likely to favor a free trade agenda—at least for energy commodities and related investments, which are likely to be resistant to political winds. Indeed, on the political front, the Trump Administration's Summary of Objectives for the NAFTA Renegotiation (released ahead of the first round of talks) emphasized furthering energy-market access and "support[ing] North American energy security." Where NAFTA is concerned, the growing mutual benefits derived from energy trade between the United States and Mexico as well as long-established relationships between the United States and Canada argue for a very careful and deliberate renegotiation of the agreement—recognizing that the current accord has worked to the advantage of all countries with regard to energy.

Ultimately, the fates of the Mexican, Canadian, and US energy sectors are entwined and appear likely to be so for years to come. This interdependence comes with risks—but fewer than with isolation. The three countries would best be served by continued and strengthened collaboration on oil and gas development and electricity generation, providing all three countries with secure supply while appropriately addressing environmental concerns.

Mr. UPTON. Thank you very much.
Mr. Burchett.

STATEMENT OF ALLEN BURCHETT

Mr. BURCHETT. Good morning, Chairman Upton, Ranking Member Rush, members of the subcommittee, and my fellow panelists. Thank you for the opportunity to testify. My name is Allen Burchett, and I am global head of strategic projects for ABB.

I am testifying on behalf of the National Association of Manufacturers, which represents nearly 14,000 small, medium, and large manufacturers in every industrial sector and in all 50 States.

We are the number-one manufacturer of power grids in the world and a leader in industrial automation for the petrochemical industries. We are the number-one producer of electric motors and the second-largest producer of electric drives and industrial robots. We supply the energy, the electricity, and manufacturing sectors with enabling technologies that help them stay competitive.

ABB has a strong and growing U.S. manufacturing footprint and is proud of our 20,000 employees across 50 manufacturing facilities, including those in Michigan, Texas, Oklahoma, Ohio, Virginia, and North Carolina, which is home to our U.S. headquarters.

Over the past decade, we've invested over $11 billion in the United States, tripling our workforce. We have chosen to invest in the U.S. because it's our largest market worldwide and we believe in being close to our customer. We believe in the American worker.

A strong North American supply chain has supported our domestic growth and investments, enabling ABB to competitively manufacture here.

For manufacturers throughout the U.S., the North American commercial market is the most important market in the world. Over 60 percent of U.S. manufacturing output in 2016—$1.36 trillion—was sold in the U.S., Canada, and Mexico.

Canada and Mexico alone purchased one-fifth of all U.S.-manufactured goods in 2016, more than the next 10 U.S. trading partners combined. Eleven manufacturing sectors have experienced growth of more than 50 percent since 1993.

Of particular interest to this subcommittee, energy products have led the pack, with over 250 percent growth. Most U.S. manufacturing sectors, 36 out of 42, count Canada or Mexico as their top foreign market.

Despite growth in manufacturing, a changing energy landscape has created a major need for new and improved energy delivery infrastructure. Investor-owned utilities alone expect to invest more than $300 billion over the next 3 years.

ABB has been a participant in this manufacturing boom and has developed an integrated North American supply chain that supports our domestic manufacturing capabilities and operations.

While much of the manufacturing of these technologies happens domestically—many of our customers are domestic—certain parts of the manufacturing processes occur in Canada and Mexico, and many of the offerings produced in the U.S. are exported to customers in Canada and Mexico.

I would like to provide a few examples. ABB is the largest producer of power transformers in the world. These transformers can

be found at power plants, manufacturing facilities, and in neighborhoods across the U.S. We build transformers at plants in Mississippi, Virginia, Missouri, and Tennessee.

Yet, the insulation materials used as inputs into these transformers are sourced from a Canadian company. In Bartlesville, Oklahoma, ABB manufactures measurement and analytics products for the oil and gas sector.

Our factory imports metal housings from the supplier in Mexico and electronic circuit boards from an ABB plant in Canada, which are both then incorporated into the final products manufactured in Oklahoma.

Many of our U.S. factories also export to Canada and Mexico. For example, 50 percent of high-voltage surge arresters manufactured in Mount Pleasant, Pennsylvania, are sold to Mexico and Canada.

ABB's Sugarland, Texas facility supplies electric infrastructure control systems to Mexico's electric grid operator and Canadian power generation.

Restrictions on trade or new barriers between the U.S., Canada, and Mexico, including on data transfer and digital solutions, would put up barriers too large on markets in Canada and Mexico and could put upward price pressure on the U.S.-manufactured goods to all of our North American customers, potentially making U.S.-made products less competitive and adversely affecting our domestic factories.

In conclusion, ABB believes the future of the U.S. economy is bright. This is particularly true on the energy sector. The integration of the three major North American economies has enhanced ABB's competitiveness, encouraged our investments in the United States.

Building on the North American Free Trade Agreement's legacy of economic growth and job creation, we can set the stage for further gains in these areas by modernizing the agreement in ways that eliminate remaining distortions and barriers, raise standards, strengthen neutral enforcement mechanisms, and remove unnecessary red tape at the border.

Thank you for the opportunity to testify before the subcommittee today, and I look forward to answering your questions.

[The statement of Mr. Burchett follows:]

TESTIMONY OF:

ALLEN BURCHETT

GLOBAL HEAD OF STRATEGIC PROJECTS, ABB

BEFORE THE:

UNITED STATES HOUSE OF REPRESENTATIVES

COMMITTEE ON ENERGY AND COMMERCE

SUBCOMMITTEE ON ENERGY

HEARING ON

"THE IMPACTS AND FUTURE OF NORTH AMERICAN ENERGY TRADE"

DECEMBER 13, 2017

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Summary of Testimony of Allen Burchett, Global Head of Strategic Projects, ABB

ABB is a pioneering technology leader in electrification products, robotics and motion, industrial automation and power grids serving customers in utilities, industry, transport and infrastructure globally with 20,000 employees in the United States across 50 manufacturing facilities in 23 states, including Michigan, Texas, Oklahoma, Ohio, Virginia, and North Carolina. Our global headquarters is in Zurich, Switzerland. The National Association of Manufacturers (NAM), represents nearly 14,000 small, medium and large manufacturers in every industrial sector and in all 50 states.

- Growth in United States' Manufacturing. Over the past decade ABB has invested over $11 billion in the U.S., tripling our workforce. The United States is our largest market worldwide and we believe in the American worker and being close to our customer. Canada and Mexico purchase more American products than the next ten countries combined. The tripling of U.S. manufactured goods exports to Canada and Mexico since 1993 has been a substantial driver of growth. Domestic growth in manufacturing and new electrical grid and natural gas innovations are creating increased demand for new energy infrastructure and products.
- Integration of North American Supply Chain is Key to Domestic Manufacturing. While a significant amount of manufacturing is domestic as are our customers, for ABB and other manufacturers in the United States, some parts of the manufacturing process occur in Canada and Mexico; and many U.S. made products are exported to Canada, Mexico and beyond. A strong North American supply chain has supported ABB's domestic growth and investments, enabling us to competitively manufacture here in the United States a variety of critical equipment that benefits the U.S. energy, electricity, and manufacturing sectors.
- Importance of Low Trade Barriers Across North America. Without duty-free transfer of inputs, components, and products between manufacturing operations in all three North American countries, the price of our products could face upward pressure, dampening competitiveness of domestic manufacturing. Building on the North American Free Trade Agreement's legacy of economic growth and job creation, we can set the stage for further gains in these areas by modernizing the agreement in ways that eliminate remaining distortions and barriers, raise standards, strengthen neutral enforcement mechanisms, and remove both duplicative regulations and unnecessary red tape at the border

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Introduction

Good morning Chairman Upton, Ranking Member Rush, members of the Subcommittee and my fellow panelists. Thank you for the opportunity to testify today. My name is Allen Burchett and I am Global Head of Strategic Projects at ABB. I am testifying on behalf of the National Association of Manufacturers, of which ABB is a member. The NAM is the nation's largest industrial trade association, representing nearly 14,000 small, medium and large manufacturers in every industrial sector and in all 50 states. Manufacturing employs more than 12 million women and men across the country, contributing more than $2.17 trillion to the U.S. economy annually. If U.S. manufacturing were a separate country, it would be the ninth-largest economy in the world. More than 90 percent of NAM members are small and medium-sized businesses.

ABB is a pioneering technology leader in electrification products, robotics and motion, industrial automation and power grids serving customers in utilities, industry, transport and infrastructure globally. Our technologies are essential to the American energy industry, from generation and production to transmission, distribution, and end use.

We are the number one manufacturer of power grids in the world and a leader in industrial automation for the petrochemical industries. Globally, we are the number one producer of electric motors and the second largest producer of electric drives and industrial robots.

ABB has a strong and growing U.S. manufacturing footprint. ABB is proud of our 20,000 employees across 50 manufacturing facilities in 23 states, including Michigan, Texas, Oklahoma, Ohio, Virginia, and North Carolina, which is home to our U.S. headquarters (Appendix A). Our global headquarters is in Zurich, Switzerland.

Over the past decade we have invested over $11 billion in the United States, tripling our workforce. We have chosen to invest in the United States because it is our largest market worldwide and we believe in being close to our customer and we believe in the American worker. A strong North American supply chain has supported our domestic growth and investments, enabling ABB to competitively manufacture here in the United States a variety of critical equipment for our North American customers in the energy industries.

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Impact of North American Trade on Energy

ABB is not alone in recognizing the importance of the U.S. market. For manufacturers throughout the United States, the North American commercial market is the most important market in the world. Over 60 percent of U.S. manufacturing output in 2016 ($1.36 trillion) was sold in the United States, Canada and Mexico. Canada and Mexico

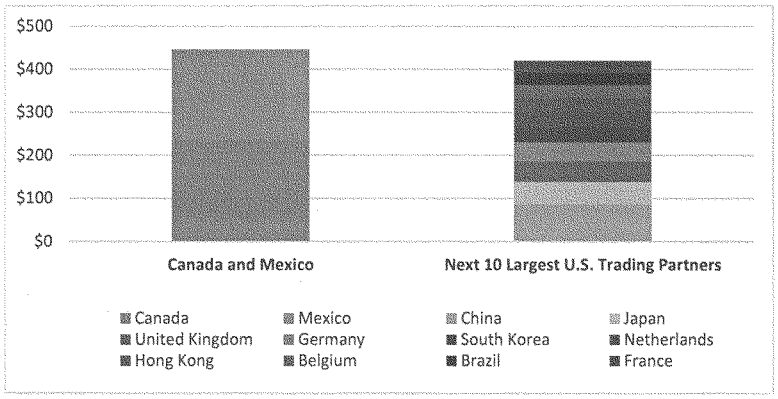

Figure 1. U.S. Manufactured Goods Exports, U.S. $ Billions, 2016. Source. U.S. Dept. of Commerce

alone purchased one-fifth of all U.S. manufactured goods production in 2016, more than the next ten U.S. trading partners combined (Figure 1).

U.S. manufacturing has grown dramatically over the past 25 years. U.S. value-added manufacturing hit a record-high of $2.18 trillion in 2016, nearly double its 1993 level of $1.13 trillion (Figure 2). That growth has been fueled by the more than tripling of U.S. manufactured goods exports to $1.27 trillion in 2016 compared to $411 billion in 1993 (Figure 2). U.S. manufactured goods exports to Canada and Mexico were a primary driver of this growth, also tripling during this period and representing about one-third of current U.S. exports.

Importantly U.S. manufactured goods exports support the jobs of more than 6.7 million men and women in manufacturing, more than half the U.S. manufacturing workforce. Exports of U.S. manufactured goods to Canada and Mexico alone directly support the jobs of more than 2.2 million women and men in U.S. manufacturing.[1] In addition, for every worker in manufacturing, another four employees are hired elsewhere.

[1] Chris Rasmussen and Susan Xu, Jobs Supported by Export Destination 20015, U.S. Department of Commerce, accessed at www.trade.gov/mas/ian/build/groups/public/@tg_ian/documents/webcontent/tg_ian_005508.pdf

Significantly, the average manufacturing worker in the United States earned $82,023 annually, including pay and benefits, nearly 27 percent more than the average nonfarm business worker.[2]

Eleven manufacturing sectors have experienced growth of more than 50 percent since 1993 (Figure 3). Of

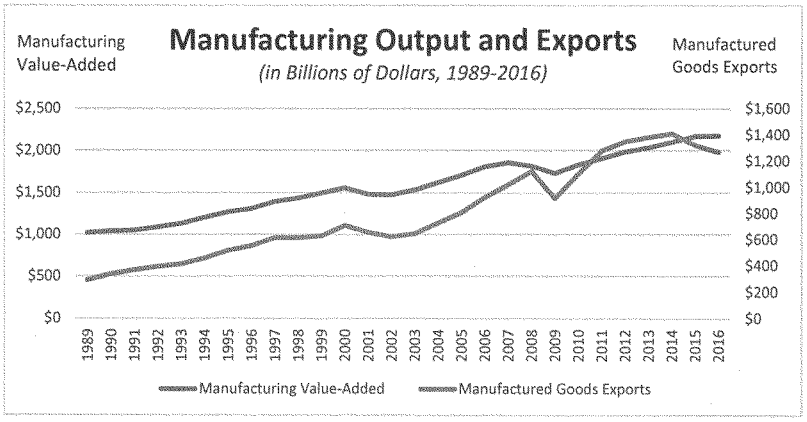

Figure 2. Manufacturing Output and Exports. ***Source****: Bureau of Economic Analysis, U.S. Commerce Department (2015 data), United Nations Database (for output data before 1997), World Trade Organization (for export data before 2002)*

particular interest to this Subcommittee, energy products have led the pack, with over 250 percent growth. Again, Canada and Mexico have played an outsized role in this growth, with most U.S. manufacturing sectors (36 out of 42) counting Canada or Mexico as their top foreign market. At ABB, we manufacture the equipment and control systems that enable the domestic upstream, midstream, and downstream oil, gas, and chemical plants to keep producing safely, efficiently, and cost-effectively.

Domestic growth in manufacturing has created a major need for new and improved energy delivery infrastructure. On the electricity side, innovation, regulations and market dynamics are driving rapid changes to the electric grid and the way electricity is produced in the United States. The electric grid has traditionally been a one-way system: power plants make electricity, and consumers use it. The grid of the future—and, increasingly, the present—is multi-directional, relying on traditional electric generation but also combined heat and power (CHP) technologies, distributed resources like rooftop solar, energy storage, microgrids, and demand-side

[2] NAM, Top 20 Facts about Manufacturing, accessed at http://www.nam.org/Newsroom/Facts-About-Manufacturing/.

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management technologies. Investor-owned utilities expect to invest more than $300 billion over the next three years to enhance the grid and reshape the nation's electric generation fleet.[3] Increased dependence on natural gas in the manufacturing and electric power sectors has also brought about a need for new infrastructure. A recent NAM-commissioned report by IHS Economics found that total natural gas demand is poised to increase by 40 percent over the next decade—double the growth of the past 10 years.[4]

Benefits of North American Trade to Energy

ABB has been a participant in this manufacturing boom and has developed an integrated North American supply chain that supports our domestic manufacturing capabilities and operations, and in turn, the United States'

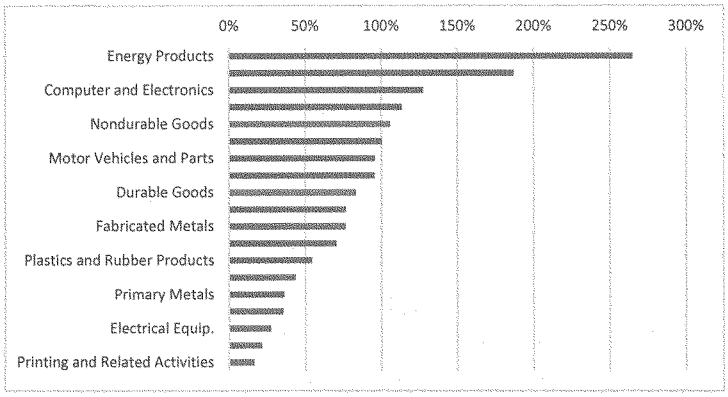

Figure 3 U.S. Manufacturing Change in Value-Added, 1993-2016 (in %). ***Source****: U.S. Dept. of Commerce. NAM calculations based on United Nations Statistical Division Commodity Trade (UN COMTRADE) Data Base, 2015, accessed at http://wits.worldbank.org/*

energy, electricity, and manufacturing sectors. As the global leader in both power grids and process automation, we supply the energy and electricity sectors with enabling technologies that help them stay competitive. For example, for the oil and gas sector, we provide the motors, control systems, electrification and automation technologies on which they depend to safely and efficiently produce and deliver their products. The massive growth in trade with Canada and Mexico in these sectors has had a positive impact on ABB and other manufacturers big and small throughout the United States, supporting millions of good-paying jobs.

[3] Edison Electric Institute, Delivering America's Energy Future: Electric Power Industry Outlook (Feb. 8, 2017), accessed at eei.org/resourcesandmedia/newsroom/Pages/Press%20Releases/EEI%20to%20Wall%20Street%20The%20Promise%20of%20Tomorrow.aspx.
[4] http://www.nam.org/Data-and-Reports/Reports/Natural-Gas-Study/Energizing-Manufacturing/

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While much of the manufacturing of these technologies happens domestically and many of our customers are domestic, certain parts of the manufacturing process occur in Canada and Mexico, and many of the offerings produced in such places as Pennsylvania, Mississippi, Oklahoma, and Virginia are exported to customers in Canada and Mexico.

I'd like to provide a few examples of how our manufacturing supply chain reaches across North American borders to provide competitive infrastructure equipment to the energy and electricity sectors. ABB is the largest producer of power transformers in the world, these transformers can be found at power plants, manufacturing facilities, and in neighborhoods across the United States. We build transformers at plants in Mississippi, Virginia, Missouri, and Tennessee. Yet the insulation material used as inputs into these transformers are sourced from a Canadian company. The transformers manufactured in Crystal Springs, Mississippi use high voltage instruments from Mexico. Transformer equipment produced in Alamo, Tennessee uses fuse assemblies, switches, and safety devices manufactured at an ABB facility in Mexico. Similarly, high voltage power circuit breakers produced in Mt. Pleasant, Pennsylvania incorporate control panels produced at an ABB facility in Mexico.

In Bartlesville, Oklahoma, ABB manufactures measurement and automation products for the oil and gas sector. Our factory imports metal housings from a supplier in Mexico and electronic circuit boards from an ABB plant in Canada, which are both then incorporated into the final products manufactured in Oklahoma. These products are found at wells, pipelines, and refineries and are purchased by household names and small to mid-sized businesses alike in the United States, Canada, and Mexico.

Our U.S. manufacturing operations also supply components to ABB's other North American factories for final assembly and sale. For example, our U.S. and Canadian factories manufacture components that are shipped to our factory in Monterrey, Mexico, where they are incorporated into electrification products and then sold to Mexican and Canadian customers. Without duty-free transfer of inputs, components, and products between manufacturing operations in all three North American countries, the price of the products we sell to our domestic and North American customers could face upward pressure; dampening the competitiveness of our domestic manufacturing plants as they sell to Canada and Mexico, who in many cases could obtain similar products from Europe or Asia.

In addition to relying on the North American market for our cross-border supply-chains, many of our domestic manufacturing facilities export final products to Canadian and Mexican customers. For example, 50

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percent of high voltage surge arrestors manufactured in Mt. Pleasant, Pennsylvania are sold to Mexico and Canada. ABB's Sugar Land, Texas facility supplies electric infrastructure control systems to Mexico's electric grid operator and Canadian power generation companies. Restrictions on trade or new barriers between the United States, Canada, and Mexico, including on data transfer and digital solutions, would put up barriers to large markets in Canada and Mexico and could put upward pressure on U.S. manufactured goods to many of our Canadian and Mexican customers, potentially making U.S.-made products less competitive and adversely affecting our domestic factories.

The benefits of cross-border trade extend beyond the energy industry. In 2015 in Michigan, ABB opened the United States' first industrial robotics factory. The size of the total North American market made locating a new robotics plant in the United States attractive. Instead of importing robots from factories in Sweden and China, our Auburn Hills, Michigan factory will be able to produce 90 percent of the robots we sell in North America. But as with our technologies for energy customers, some inputs into the robots manufactured in Michigan come from Canada and Mexico, boosting Auburn Hills' cost-competitiveness. Low-cost access to Canadian and Mexican markets, and ease of sourcing cross-border inputs, makes the Auburn Hills factory possible.

These examples reflect a broader characteristic about manufactured goods trade in North America, as explained by the NAM.[5] The United States, Canada and Mexico do not simply trade with each other; we build things together and rely on each other's markets to support millions of jobs and to design, build and compete in global markets. The production of goods and services in North America and globally is increasingly taking place in partnerships with related and non-related parties in each other's markets with imports and exports - in addition to research and development, and other activities distributed between countries. ABB's experience is like many other manufacturers in the United States, where U.S. imports of intermediate goods from Mexico and Canada are used to develop products that the United States then exports back to Mexico and Canada, or to the rest of the world. These partnerships with producers overseas avoid unnecessary costs and delays, promoting the competitiveness of manufacturing in the United States, which is vital in an already fiercely competitive global economy where cents on the dollar can determine a final sale. Most importantly, these partnerships have contributed to the growth of

[5] NAM, Comments of the National Association of Manufacturers on Negotiating Objectives Regarding Modernization of the North American Free Trade Agreement with Canada and Mexico, June 12, 2017, accessed at http://www.nam.org/Issues/Trade/NAM-Comments-on-Negotiating-Objectives-Regarding-Modernization-of-NAFTA/.

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an increasingly innovative, high-value modern manufacturing sector in the United States, creating higher paying and higher skilled jobs.

Conclusion

For 25 years, an integrated North American trading economy has fostered significant economic growth in the United States and ABB believes the future of the U.S economy is bright. This is particularly true in the energy sector. The economies of the United States, Canada and Mexico are linked more closely together than ever before, due, in large part, to strong trade and investment partnerships. The integration of the three major North American economies has enhanced ABB's competitiveness and encouraged our investments in the United States. Building on the North American Free Trade Agreement's legacy of economic growth and job creation, we can set the stage for further gains in these areas by modernizing the agreement in ways that eliminate remaining distortions and barriers, raise standards, strengthen neutral enforcement mechanisms, and remove both duplicative regulations and unnecessary red tape at the border.

Thank you for the opportunity to testify before the Subcommittee today. I look forward to answering your questions.

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APPENDIX A
Locations of ABB's Major Facilities in the United States

State	Location(s)	Products Made
Arkansas	Fort Smith	Industrial Motors and Generators
	Ozark	Industrial Motors and Generators
	Clarksville	Industrial Motors and Generators
	Jonesboro	Electric Installation Products
California	San Jose	Grid Automation and Digital
Florida	Ormond Beach	Electric Installation Products
	Coral Springs	Medium Voltage Products
	Lake Mary	Medium Voltage Products
Georgia	Athens	Industrial Motors and Generators
	Atlanta	Grid Automation
	Flowery Branch	Industrial Motors and Generators
Michigan	Auburn Hills	Robotics
Missouri	Jefferson City	Distribution Transformers
	St. Louis	Power Transformers Service
	St. Louis	Industrial Motors
Mississippi	Senatobia	Electrification Solutions
	Byhalia	Logistics Center
	Southaven	Electrical Installation Products
	Columbus	Industrial Motors and Generators
	Crystal Springs	Power Transformers
North Carolina	Cary	North American Headquarters
	Raleigh	Power Grids, Corporate Research
	Pinetops	Medium Voltage Products
	Kings Mountain	Industrial Motors and Generators
	Weaverville	Mechanical Power Transmission
	Marion	Mechanical Power Transmission
	Shelby	Industrial Motors and Generators
New Jersey	Hackettstown	Electrical Installation Products
New Mexico	Albuquerque	Electrical Installation Products
Ohio	Wickliffe	Oil, Gas, & Chemicals
	Westerville	Process Automation
Oklahoma	Bartlesville	Measurement & Analytics
	Westville	Industrial Motors
Pennsylvania	Warminster	Measurement & Analytics
	Mt. Pleasant	Power Grids–High Voltage
South Carolina	Belton	Mechanical Power Transmission
	Greenville	Mechanical Power Transmission
	Florence	Medium Voltage Products
Tennessee	Alamo	Transformers
	Athens	Electrical Installation Products
	Memphis	Electrical Installation Products
	Portland	Electrical Installation Products
	Rogersville	Mechanical Power Transmission
Texas	Houston	Grid Automation, Oil, Gas & Chemicals
	Sugarland	Grid Automation
Virginia	Bland	Distribution Transformers
	Richmond	Electrical Protection and Connection, Traction
	South Boston	Power Transformers

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Wisconsin	New Berlin Wauwatosa	Industrial Motors and Drives Industrial Motors and Drives
West Virginia	Lewisburg	Measurement & Analytics

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Mr. UPTON. Well, thank you. Thank you all for participating, and at this point we'll start our questions.

I have to say at the onset that, boy, if there's anything that our constituents understand, it's gas prices and, you know, back in 2008 the average gas at the pump was $3.84 a gallon. Today, or this last weekend I saw it for $2.24.

I think maybe it's a little bit higher in some other areas of the country. But it's a pretty dramatic decline and, you know, as you think about what NAFTA has done and where we are, as you pointed out in your testimony, Ms. Harbert, that we've now been running a trade surplus with Canada and Mexico in refined petroleum and coal, and the trade deficit with these countries in oil and gas has been shrinking rapidly.

It's in large part because we now really, truly have a North American energy independent plan that is coming to fruition, which is one of the reasons why these prices of energy have fallen, whether it be in LNG, whether it be with the gas at the pump, as well.

You indicated at the end of your testimony that, if NAFTA was changed dramatically, it truly would threaten not only our energy security, but I have to presume it would also dramatically increase prices to consumers, as well.

Can we explore that a little bit?

Ms. HARBERT. Certainly. We have benefited from increased trade in North America, and, by lifting the oil export ban and increasing our LNG exports around the world, the American consumer and the American industry has benefited tremendously.

Consumer prices have gone down by about 14 percent, and if that were to change and for some way we would jeopardize either the certainty provided by NAFTA or the investor protections provided by NAFTA or even the reforms that have been undertaken in Mexico, that would threaten production in the United States because it could not find its natural markets.

It would also undermine current investments planned for Mexico, which would then bottle in some of our domestic capacity. So it's a lose-lose if we undermine NAFTA in any way that has been the basis for an incredible energy integration effort that is providing tremendous benefits to industry, consumers, to our national security, as we are now getting more oil from them than from OPEC, and also, obviously, our energy security.

Mr. UPTON. Mr. Thompson, as we know, the Gulf Coast is home to the most technologically advanced refineries in the world. Many of us have been down there to see these advances.

How has the North American energy integration benefited the consumers of these products, and how might we strengthen—as these negotiations are going on with the three countries—what might you suggest to actually improve our situation in regard to the technological improvements that could be done?

Mr. THOMPSON. Thank you for the question.

I will just add that we have sophisticated facilities in far more than just Texas. We have some in your fine State, and we have them in 33 States. So, you know, a strong energy sector helps out most of the country.

As far as, you know, NAFTA goes, as we talked about it, it's pretty simple at its core. We got a lot of product from Canada, and we were able to sell a lot of finished goods to Mexico, and this is good for consumers.

We get more than—you know, 40 percent of all of our imports come from Canada, and we get it duty free. So that means lower price for crude, which benefits the American consumer.

As far as additional protections, we think that a more robust chapter in NAFTA dealing with energy, dealing with how it's developed and the modern way it's traded, would benefit all.

We certainly believe that we would benefit from having the three countries work together on infrastructure so we can find the best ways to get crude to our refineries and products to consumers in the most efficient way.

Mr. UPTON. So, Ms. Harbert, you know, as we think back to where we were, back particularly in the '70s, I mean, we've got the new abundance that's there now—the developments in shale technology, all those different things.

Many of the laws and regulations were written back in those days when we weren't exporters. What are some of the things that we could do to prevent us from being held back as it relates to energy exploration and increasing exports not only to these two countries, but the other countries around the world?

Ms. HARBERT. Well, first, I think it's "do no harm." Don't do anything to impair our ability to export to North America and beyond. Make sure that we can get those export facilities sited very quickly.

We have to make sure that the regulatory process—and you guys have been working on this—is fair, transparent, and incorporates cost-benefit analyses.

And last but not least, there is significant room for permitting reform, both within the country to move our products around more efficiently and also to export them to North America, both to Canada and to Mexico, and to import them as well.

We've had a 7-year-waging war on importing more oil from Canada. But we shouldn't lose sight of the fact that we have a tremendous opportunity to export our own natural gas—clean-burning natural gas—to Mexico with some additional permitting reforms.

So both, I think, a laserlike focus in the upcoming debate on infrastructure in the Congress, who really need to take a very hard look at continuing reg reform and certainly permitting reform.

Mr. UPTON. Thank you.

Mr. Rush.

Mr. RUSH. I want to thank you, Mr. Chairman.

Dr. Krupnick, in your written statement you ask the Members to envision a world where the three North American countries act as a free-trade energy bloc which could rival every other nation or bloc in its ability to influence world markets for oil and gas.

If we were to continue along the path we are currently on, with no changes to NAFTA and additional coordination, harmonization, and integration between the U.S., Canada, and Mexico, how long do you envision it would take for North America to truly rival a competitor like OPEC?

Dr. KRUPNICK. Well, this idea of a future energy bloc—the United States, Canada, and Mexico operating as a unit—is, I think,

a useful exercise to think about an ideal situation from an energy perspective.

We are, obviously, I don't think, ever going to head in that—we are heading in that direction, but we are never going to be there. We are not going to have an E.U.-type structure with Mexico, Canada, and the United States.

But I think it's useful for thinking about how to realize as many gains from trade and as many—as lowest possible cost to industry of addressing environmental regulations, let's say, by harmonizing those regulations across countries so that there's sort of only one regulatory model that industry needs to address.

So I think it's a useful paradigm. It's not something I see that's actually going to happen in my lifetime, anyway.

Mr. RUSH. Thank you.

Mr. Thompson, in your testimony you noted that, in 2016 alone, the U.S. exported $20.2 billion worth of energy products to Mexico and imported $8.7 billion worth of energy products.

In terms of jobs, how many U.S. energy jobs would potentially be impacted if the administration were to unilaterally make changes to NAFTA in a way that might upset our two trading partners and possibly hurt the mutually beneficial energy trade that we all can agree is very notable and profitable for all three countries?

Mr. THOMPSON. Thank you for the question.

We are optimistic that we are going to come through with modernized NAFTA and these negotiations are going to stay on track.

We certainly are proud of what our industry means from an employment perspective. As I said in my testimony, we support 3 million jobs, and those jobs are there because of our strong energy sector and certainly are going to be strengthened the more we work with our neighbors to the north and the south.

We believe that there's lots of opportunities in Mexico now that they have liberalized their energy network, and we already have a number of companies. We have Andeavor and Valero and ExxonMobil have entered the market—the downstream market in Mexico for the first time in many, many decades.

We are supplying over half of their gasoline needs, and that's going to continue grow, and as that grows it's going to strengthen our need for employment.

Mr. RUSH. I want to just ask all the panelists, is there anyone on the panel who believes that our Nation would benefit if the administration unilaterally opened up negotiations on NAFTA and insists on establishing new terms that would be more beneficial to the U.S.?

Mr. THOMPSON. Well, to be clear, we certainly believe that NAFTA would benefit by being modernized. So we do think, if modernized, it could benefit the energy industries we talked about.

We believe that there could be a more robust chapter on energy in NAFTA. We believe that the United States should make sure that direct investors are protected, particularly now that Mexico has liberalized its energy system.

We think that a modernized NAFTA could do that. We think that it could be enhanced to help us with regulatory cooperation with Mexico and Canada. So there are, Mr. Rush, lots of things that could be improved through NAFTA modernization.

Ms. HARBERT. We at the Chamber believe that withdrawal would be devastating to the U.S. economy. Modernization is preferable. First, do no harm and then make it better.

That's what modernization means, and that includes, from American business perspective, making sure that we have those investment protections in place that ensure that we have an ability to adjudicate our disputes fairly.

So we need to stay in this game. I think we've all laid out—all the panelists have laid out the stakes. They're high, and we need to find a way to get to yes.

Mr. RUSH. Thank you.

Dr. KRUPNICK. I just want to raise, there's more going on than just NAFTA. So we shouldn't lose sight of these other agreements that the administration is giving short shrift to or even walking away from on the environmental side.

Mr. BURCHETT. From a North American Manufacturers' and an ABB point of view. We support modernizing the agreement.

Mr. RUSH. Thank you.

Mr. Chairman, I yield back.

Mr. UPTON. Thank you.

Mr. Barton.

Mr. BARTON. Thank you, Mr. Chairman and Ranking Member Rush, for holding this hearing.

Before I ask my questions, I want to thank Karen Harbert for her help in passing the repeal of the ban on crude oil exports.

You and the Chamber were big helps in that, and we've exported as much as 2 million barrels a day in the last year, and I think we are about a million and a half barrels a day now. So thank you and your organization for that.

I want to ask a little bit different question than Mr. Rush did, but it's basically the same thing. From reading your testimony and listening, my impression is that all of your organizations support staying in NAFTA in some way.

Is that true? Is there anybody that advocates getting out of the NAFTA treaty?

Everybody's shaking their head, so we'll say that that's a no. I will ask Mr. Thompson, will there ever be a day when the U.S. refineries, which had really configured their refineries to use the heavier Mexican and Canadian crudes, that they will reconfigure to focus on the lighter U.S. shale crudes?

Mr. THOMPSON. Well, I certainly couldn't say there will never be a day, but right now I think they're configured in the most efficient way possible. As you know, oil is a global commodity, and the most efficient—you know, we are configured right now the most efficient that we can be. The heavier crudes that we are designed to handle we are handling, and the lighter stuff that can be better processed is being exported.

And so can I say never? No. But I think right now we have a very efficient system that's operating the way the global market dictates.

Mr. BARTON. Well, if that's the case, then we almost have to maintain some sort of a NAFTA arrangement, because the Canadian and the Mexican crudes are the more sour, heavier crudes. Is that not correct?

Mr. THOMPSON. That's correct. And, you know, I shook my head in agreement, but I will say it out loud: Yes, we certainly and wholeheartedly agree that we should stay in NAFTA.

Mr. BARTON. This is a little bit off the NAFTA issue, but in that happy day, if it ever were to occur that we would actually build a new U.S. refinery—and I know that's unlikely—I know we expand and modernize—but if were to actually from scratch build a new U.S. refinery, how would that refinery be configured?

Would it still be configured for the heavier crudes that we import, or would it be configured to use the lighter crudes that apparently now we are exporting?

Mr. THOMPSON. You know, frankly, I am not in the best position to answer that. I think people much smarter than me would design it in a way where they believe they'll have the best access to crude.

Could it be configured to handle the lighter stuff? Sure. But there's arguments to handle the heavier stuff, as well.

I will say on this point, we have adequate refining capacity today to meet our domestic needs. So right now there's no need to build an additional refinery.

Mr. BARTON. OK. I will ask Ms. Harbert, with the—I don't know how you exactly say it, but the Mexican legislature and president have changed their policy and changed their laws to allow international companies to own more and be more invested in Mexico. How is that going? Are they——

Ms. HARBERT. Well, and first, let me thank you for your support and leadership in lifting the oil export ban, which has done a tremendous benefit to the American economy, and the EIA estimated for 2018 we will produce more oil than ever before in our Nation's history, and obviously a lot of that will continue to be exports and particularly supplanting oil from other countries that don't like us so much.

You know, in Mexico it's happening, and we have to congratulate the legislature and the president for being very courageous in doing something that took a long time to undo. And every major American company is down there with an office looking at how they can take advantage of this opportunity. Permits have been granted, infrastructure is being built, and to stop something right in the middle of its tracks of enjoying a boom of reinvesting back into Mexico would be tragic.

There are companies that have a lot of pent-up energy and a lot of pent-up demand for realizing a better relationship with Mexico.

So it's going great, but it can only get better, and what we have to worry about is that a change in NAFTA or a change in leadership in Mexico that would jeopardize any of that certainly, you know, we would have to take that with a grain of salt—a grain of caution.

Mr. BARTON. All right.

Thank you, Mr. Chairman.

Mr. UPTON. Mr. McNerney.

Mr. MCNERNEY. I want to thank the chairman, thank the witnesses this morning. I will start with Mr. Thompson.

You mentioned that North America will be energy secure by the year 2020. Could you explain what that means exactly? What does energy security mean to you?

Mr. THOMPSON. Well, let me just say that that's not, you know, me saying it. That's the International Energy Agency—the IEA—that's saying it, and what that means is that we are producing a level of liquid fuels that satisfy our North American needs.

So, basically, we are producing enough to satisfy our own needs and we are not relying on any other country for our energy needs.

Mr. MCNERNEY. So we'd cut OPEC off, basically, from American——

Mr. THOMPSON. Well, we would have the potential to cut them off. Again, you know, whether the market would dictate that is another matter.

But we could. We would be energy secure at that point.

Mr. MCNERNEY. Do you disagree, Doctor?

Dr. KRUPNICK. I just wanted to mention that oil is a global market, and the price of oil is determined in a global market in the absence of, let's say, Saudi Arabia's cutting back its supply voluntarily or on its own to change price.

So we can never really be independent of other countries, other producers, because we'll always be dependent through the price.

But, obviously, as our oil demand falls and our domestic supply grows, it does give us a greater measure of energy security.

Mr. MCNERNEY. Well, you have been advocating for harmonization, Dr. Krupnick. But just yesterday we had a hearing on the CAFE standards—tremendously difficult to get harmonization within the United States itself. So is there a pathway for us to reach harmonization with the other countries?

Dr. KRUPNICK. Well, initially, I would just hope that we could get behind the agreements that we already had with Canada and Mexico. The ones I mentioned were on environmental issues.

There's an agreement with Mexico and the United States to jointly inspect facilities in the deep water of the Gulf of Mexico to make sure that they're living up to the safety standards that both countries are enforcing.

So I think there's a lot that can be done bilaterally and trilaterally.

Mr. MCNERNEY. Well, you mentioned that pulling out of the Paris conference—I think I understood you to mention or imply that that hurt the confidence of investors. Could you expand that a little bit?

Dr. KRUPNICK. I don't know if I exactly said it that way, but I think what we are seeing is that companies around the world and international companies that are located and based in the United States, plus companies in the United States, are already using what we would call as economists shadow prices of carbon—that is, internal prices of carbon to help in their investment planning.

So whether we pull out of the Paris Accords or not, companies can't afford not to bet on a future without climate legislation in the United States. So they have to take the long view with investments, let's say, in pipelines lasting 40 years.

They've got to take the long view in their investment decisions about what's going to happen to climate policy in the future, in the U.S. and around the world, and they're doing that irrespective of whether we are currently in the Paris Accords or not.

Mr. MCNERNEY. One last question. You said that Congress could help promote renewable capacity using local resources. Could you expand on that a little bit as well?

Dr. KRUPNICK. Yes. So, I am not in Congress. I don't know the levers that you all have to use. Some of it is just moral suasion, some of it is, as I am sure, is passing bills.

But Mexico is blessed with very good solar energy, and Canada has a lot of unexploited hydro electric energy. So the United States could benefit, and Mexico and Canada could benefit, by taking advantage of these locational advantages that these countries have to have our electricity be cheaper for American consumers.

Mr. MCNERNEY. And these can be cost competitive with traditional fuels?

Dr. KRUPNICK. Well, they can be, certainly in the hydro front they can be, and potentially in Mexico. Kind of better having solar in Mexico than having solar in New England.

Mr. MCNERNEY. Thank you. Mr. Chairman, I yield back.

Mr. UPTON. Mr. Olson.

Mr. OLSON. I thank the Chair, and welcome to our four witnesses with a special Texas welcome to Secretary Harbert.

Ma'am, you and I share a common bond. We are both Rice Owls—Jones '85. Welcome. There we go. Well, Jones beats Hanson at all the sports that matter. So, again, welcome.

Also welcome to Mr. Burchett. As you know, sir, ABB has a presence there in Sugarland, Texas, as you mentioned. Please come down and visit. You will love to see the facility. It's amazing.

Also, right around the corner is a restaurant called the Live Oak—the best burgers in Fort Bend County, right there at Live Oak, right by ABB in Sugarland, Texas.

And this is no news, but North America and energy trade is vital to the world's economy. Heavier crude from Canada is a critical part of the American refining space.

We all know that the Eagle Ford shale does not stop at the Rio Grande waiting for a visa to cross, and we know that as Mexico improves its energy sector, our ties with that neighbor will only grow stronger.

And make no mistake, we are on the verge of replacing OPEC with a de facto NAPEC—North American Petroleum Exporting Countries.

And, of course, my own State of Texas' ties to Mexico are also important for electricity. They have been invaluable in our electricity market.

For example, in August of 2011, my State was hit with a statewide heat wave—over 100 degrees on every square inch of our State the entire month of August.

That put us in a situation of some rolling blackouts. Mexico sent power across the river to help us out. Over 200,000 homes were powered by energy electricity from Mexico.

It's an important relationship for Texas and America to have.

My first question is for you, Mr. Burchett. In your written testimony, you talked about how, one, electric transformers come together from sites all across the North America, and that's a great example of how trade works in energy.

Can you discuss how trade deals like NAFTA make that possible and what would happen if the global supply chain—if it spikes with terrorists?

Mr. BURCHETT. Thank you, Congressman Olson. And, by the way, my office is in Houston, Texas, so I do get to Sugarland quite often. So——

Mr. OLSON. Remember, the Live Oak. Live Oak.

Mr. BURCHETT. Live Oak. Got it.

So ABB is a—you know, we are a multinational multibillion-dollar company, and we make investments all the time. What drives those investments is consistency, stability, low trade barriers.

And so, when we think of NAFTA, that helps drive those types of investment, because we have the consistency and the stability that's provided there.

Mr. OLSON. OK.

Ms. Harbert, a question for you and the U.S. Chamber of Commerce: You were pretty clear in your testimony that our Chamber never, ever wants to see America walk away from NAFTA.

At our local five-star Chamber of Commerce in Sugarland, the Fort Bend Chamber of Commerce, led by Kerry Schmidt, repeats that message to me every single time we meet at home.

With that said, are there items that could be included in negotiations which would hamstring the agreement even if we stay part of it?

To put it here in DC terms, is there a poison pill that's possible that looks benign that could bring the whole structure down?

Ms. HARBERT. Well—and thank you for your kind comments, and I will try and get the Hanson Athletics to step it up a little bit.

You know, I am glad to see that the echo chamber is working, because the business community is united in its support of NAFTA—modernization, not withdrawal, and protection of those parts of NAFTA that are very important to the business community, specifically investor protections that are in there.

If those were taken out, I think American industry would have a very, very large problem in agreeing with the future terms of NAFTA. There are lots of things that can be done to improve it. But that would be one that would be very difficult, and if were to see that go away and then we would have steep tariffs, you can know what would happen to the American consumer here.

So we have our eyes laserlike-focused on the investor protections to make sure they are included.

Mr. OLSON. I think I am out of time and, Mr. Chairman, again I thank the witnesses, and Merry Christmas.

I yield back the balance of my time.

Mr. UPTON. Mr. Peters.

Mr. PETERS. Thank you, Mr. Chairman. Thanks to the witnesses for being here. Ms. Harbert, when we saw each other the last time, it was probably 80 degrees where we were. Not that way today.

Thanks for being here. Just a couple observations. First of all, there's a lot to like about energy abundance for consumers, for manufacturing, and even if our friends to the north and the south—Mexico and Canada—even if we don't act like OPEC, it's still advantageous to have friendly countries to trade with for energy.

Another observation: This really has been about petroleum and hydrocarbons, not all energy trade. We haven't talked about next-generation nuclear or renewables.

That's also part of the discussion. But just focused on what we've covered here, it does strike me as, with all this abundance, an odd time to be opening up Alaska to offshore drilling.

I don't see the need for that. It's part of a tax bill that didn't even ever discuss the $2 billion of subsidy we provide at a time of all this abundance, and then at the same time we are talking about depleting the strategic petroleum reserve at prices that almost couldn't be lower. It doesn't seem like it's very smart. I observe that as part of the context.

Ms. Harbert, I am with you on regulatory reform and permitting reform. Actually, in my previous life I represented a lot of clients who tried to get through Government processes that could be very, very frustrating.

I believe we can achieve high environmental standards with less drag on the economy. Would like to work with you on that.

Along those lines, one thing I would point out is what's happening around methane right now. I saw today that the American Petroleum Institute—and this is great news—started its own business partnership to deal with reducing VOCs and methane.

They are probably observing what I am observing, is that these rules are becoming politicized, and that's bad for business because what's going to happen is you get this back and forth. If the President wants to undo everything because it's got Obama's name on it, that's not good for business, either.

So I congratulate the American Petroleum Institute. I know the Chamber is interested in certainty. We can have good methane rules that protect us and the environment and are certain for business. I would like to work with you on that.

And I am with you on NAFTA. For me in San Diego, one of the most important parts of our economy is our trade with Mexico. Our relationship with Mexico is very important to us.

I am a supporter of President Obama's TPP negotiations. Again, the business community seems united behind this. I can't speak for all the Democrats here, but I understand the need for dispute resolution that's free from some of the hometowning, particularly in developing nations. I think that makes a lot of sense.

Maybe we should just rename it the Trump Pacific Partnership and be on with it. Maybe get a vote on it that way.

But what I did want to just say, because a lot of this has been covered, I heard mostly discussion in terms of modernizing about leaving it the same, making sure that we preserve dispute resolution, making sure that we do no harm.

I just wanted to give you an opportunity—I think we've been asked this before—are there any specific changes you'd like to see in terms of modernization that we should be asking for?

And Mr. Burchett, I will start with you.

Mr. BURCHETT. Thank you, Congressman.

There are more experts than I on the NAFTA agreement. I know in my career,I remember when it started, and I was doing business in Mexico. It's been 23 years. So I would defer to the experts on NAFTA for the modernization.

But it just seems to me that given the changes that've happened in the 23 years, given the shale gas revolution, given the high-tech things that we do now, like the refineries mentioned by Congressman Upton, which is ABB technology, and given the level of trade that I see with our 50 manufacturing plants and a nice footprint in Canada also of manufacturing and a nice footprint in Mexico, it seems time to modernize.

Mr. PETERS. Yes. Anything, Ms. Harbert?

Ms. HARBERT. I have a couple of very specific things: that a new NAFTA would ensure that the cross-border trade of crude oil and natural gas and refined product wouldn't be subject to any quantitative measures or tariffs; secondly, that we could more safely or more quickly develop safe cross-border interconnections of electricity and hydrocarbons; and lastly—there's two more—we really need to look at and prohibit local content rules that the industry could not meet, and we should take a hard look at some common standards and regulations.

Not all—where it makes sense in the energy sector, so we can more harmonize, which is a scary word to our friends in the north, they don't like that word. But we could find some commonality.

Mr. PETERS. OK. That's very constructive.

Dr. Krupnick, anything you want to add, briefly?

Dr. KRUPNICK. No. I think this has been pretty well covered.

Mr. PETERS. OK. I really appreciate you—I look forward to working with you to see if we can't say what's good and make it better.

And Mr. Chairman, I yield back.

Mr. UPTON. Mr. Shimkus.

Mr. SHIMKUS. Thank you, Mr. Chairman. I appreciate my colleague from California's questions. I've got a—just a picture should go up on the screen, and I was trying to find another one but, really, that just gives you, you know, either pipelines, crude oil crossings, and sometimes they don't show going in to Mexico, but there's a little, like, a dot where the crossing location is for crude, for refined product, for hydrocarbon gas liquids, for natural gas, and for electric transmission.

So I think what we struggle with is, those of us who have been on the committee, which is one of the reasons why I love the committee—we are interconnected. We are there. We've been there for a long time. We are going to continue to have this.

So, why I think the hearing is important is—and Ms. Harbert, you just raised some of the issues of the concerns that, if there's a pullout of NAFTA, what damage do you do to that interconnected North American grid, or North American crude oil, or oil-refined product lines.

Does anyone want to mention that real quick?

Ms. HARBERT. Looking at your map, if you can imagine in a world without NAFTA anything that would be coming into the—for example, to Texas, if, you know, electricity, if there was going to be a toll or a tariff put on there that we would have higher prices than we actually, you know, charge in America, that would be a huge disincentive for our energy security because we depend on this, as you well pointed out, and if we change that economic equation, that's going to raise prices here at home, and we are going to have to search for other suppliers.

Mr. SHIMKUS. And right now there's uncertainty because of conflicting messages. So I am from southern Illinois. We are pork and beans and corn. NAFTA is very, very important for my commodity-based products.

But we also have the fear—every small town in America really has that small manufacturing facility that's moved. So that's the conflict of NAFTA for members.

In fact, not to point out ABB, but they announced a closure of the St. Louis plant—a transformer manufacturer. I don't know where it's going. But I do know—I drive by it every day when I go to the airport.

So that's the struggle with how do you renegotiate while keeping the benefits of that, or for my corn to be sold, where you're ensuring that our manufacturing sector is equally treated, because we can't negotiate wages.

We can't negotiate environmental standards. Well, maybe some people think we can but, historically, those are things left to the individual country to be able to do.

Anyone want to comment on that? Those challenges?

Dr. KRUPNICK. I could say something about the map and one thing that's not on the map. So there are a number of pipeline—there's a lot of plans to grow the number of pipelines coming into Mexico to meet that rising natural gas demand. So those could be put in jeopardy.

And then, in the Gulf of Mexico, the lease sale, round one was completed. Two is almost completed. Three is supposedly going to get into deep water, and that could be held up.

Mr. SHIMKUS. Right.

Dr. KRUPNICK. So it could put us and, of course, indirectly the Mexicans, at risk, as well.

Mr. SHIMKUS. And for those that have followed the committee and what I've done in public statements, comments, Keystone Pipeline, Keystone XL, which feeds right, obviously, from the oil sands all the way down to my district. There was a big terminal there, and then it spreads throughout all the Midwest. And we've seen not just an international negotiation, but we've seen, obviously, just internal politics delay pipeline construction.

Mr. Thompson.

Mr. THOMPSON. So let me just say, I can say with certainty that my refining facilities are the most efficient in the world, and we are not relocating anywhere, you know, under NAFTA. We are going to be there.

But, you know, as our transportation demand for fuel flattens out, our facilities need export markets to continue to grow and prosper.

Mr. SHIMKUS. Right. I think that's a good point, and I was going to jump on that with the last 40 seconds. Just for the liquid transportation fuels debate, we had that hearing yesterday on CAFE and greenhouse gas, and the debate of EV penetration.

Now, it's not huge across the country, but electric vehicle penetration in California is noticeable, and international comments about, like, Norway and France who are trying to make—or China, that really could disrupt this market—crude oil and refined products, don't you think?

Mr. THOMPSON. EV penetration could indeed, yes. It could be very disruptive.

Mr. SHIMKUS. So we need to keep the liquid transportation market.

Mr. THOMPSON. We need to keep the liquid transportation market strong.

Mr. SHIMKUS. Thank you very much. I yield back.

Mr. UPTON. Mr. Loebsack. Oh, I am sorry. He left.

Mr. Tonko.

Mr. TONKO. Thank you, Mr. Chair. Welcome, witnesses.

One area where our energy sector is undeniably and quite literally interconnected is the United States and Canadian electrical grid systems.

In 2016, the U.S. imported 73.1 million megawatt hours of electricity from Canada, about a quarter of which went to New York State, my home State.

Dr. Krupnick, do the interconnections between the United States' and Canadian power systems improve greater reliability on both sides of the border?

Dr. KRUPNICK. Well, sure. The short answer to that is yes. To maximize the benefits of cross-border electricity trade—we have a report that talks about what to do. There are several margins to increase reliability, and one of them is to have capacity planning be a joint exercise between, let's say, control areas in the United States and in Canada.

Mr. TONKO. Thank you.

Dr. KRUPNICK. So that's not—there's a lot of things that we can do beyond what we are doing.

Mr. TONKO. Thank you.

And the Canadian hydropower is becoming increasingly important for New York State's plan to meet its clean energy targets.

So I see big potential for increased renewable electricity trade, such as the importation of Canadian hydro, which will reduce emissions in our country.

But these projects rely on cross-border transmission infrastructure. What unique challenges exist to siting, permitting, and constructing cross-border transmission compared to domestic transmission projects?

Ms. HARBERT. Well, I can take a stab at that.

You're absolutely right. The provision of Canadian electricity to the Northeast more broadly is hugely important for grid reliability. The Northeast suffered a very devastating blackout in the early 2000s, and from that was established the Electricity Reliability Coordination Council, which seeks to look at these things and manage the grid up there more responsibly. And so that's an important new organization that helps us to do that.

Cross-border is still hard, and it takes approvals from both sides of the border. Sometimes it takes State and local, because it's not just crossing the border, it's going through other municipalities and counties that might not be excited about having a new transmission line.

So we really need to take a look at the redundancy of Federal, State, and local permitting so that we get things built in a predictable time frame.

Mr. TONKO. Thank you. Anyone else want to respond to that? Yes.

Mr. BURCHETT. Yes. So as ABB, we invented high-voltage DC transmission, which is the way you do a lot of these interconnections. So we do them all over the world. We are working on one with Denmark and U.K. now.

One of the biggest ones is for New England, and it's to get the power from Canada there. So in talking to our customers, I have heard them describe the regulatory approval process as, quote, unquote, "a game of Chutes and Ladders," and that can take 7 to 10 years. And so what they would—you know, they would like to see an expedited process, but the technology is there to get particularly hydroelectric power from Canada into New England.

Mr. TONKO. Thank you.

Yesterday marked the second anniversary of the Paris climate agreement. One hundred and ninety-seven parties have signed the Paris Agreement, and 170 parties have ratified it.

The United States is the only country with the intention to withdraw. Progress in North American and global emissions reductions will be hindered by the absence of our leadership—United States leadership.

But we have seen no indication that our neighbors intend to back away from their Paris commitments or their carbon pricing policies.

So Dr. Krupnick, do you believe it will be more difficult for the United States, Canada, and Mexico to cooperate on cross-border energy and environmental policy harmonization if the United States continues to be disengaged on global action on climate change?

Dr. KRUPNICK. The answer is yes, of course, it'll be more difficult, and as I've tried to indicate, there is still at a State level, at a regional level, there are still opportunities for that kind of engagement, let's say, that we are seeing from California with Quebec, Ontario, Manitoba, and so on in their CO_2 trading program.

So it's not like all these interactions are going to stop. But, of course, we'll be hurt in our ability to negotiate further.

Mr. TONKO. Right. And so the consequences, I believe, are probably that we would be less likely to align their policies with ours, and are there limits then to opportunities to lower costs to business and consumers?

Dr. KRUPNICK. Yes. Anytime you put barriers into a cooperation interaction, you're going to create increased costs somewhere along the line.

Mr. TONKO. Yes. With that, I thank you and yield back.

Mr. OLSON. [presiding]. The gentleman yields back.

The Chair now calls upon the gentleman from West Virginia, Mr. McKinley, for 5 minutes.

Mr. MCKINLEY. Thank you, Mr. Chairman.

In our majority memorandum binder, I read that apparently we have 73 gigawatts of electricity are being imported from Canada currently. For everyone to understand, that's the equivalent of anywhere between 70 and 120 power plants.

So I would like to focus on those implications, if I could, with this panel, because the first is currently under construction, is a Lake Erie connector. That's a thousand-megawatt, high-voltage under-

water transmission line that would provide the first direct link between Ontario power generators and the America PJM.

This Lake Erie connector will enable a subsidized Canadian power company to compete with American private-sector energy producers.

Secondly, the Quebec electricity sector is dominated by Canada's largest utility, and it's a state-owned-and-operated monopoly which is heavily subsidized. According to CBC news reports, "Canadian electricity producers are generating more power than they consume and sell off excess power to the United States at rates below the cost of production," closed quote.

This unfair competition may result in lower utility bills for us in America, but this outsourcing of our electric generation costs American jobs and lost State and local tax revenue.

Therefore, I am concerned that the U.S. markets are becoming the dumping ground for Canadian state-subsidized electricity, much like we've become the dumping ground for cheap, subsidized steel from China. Those are my concerns.

The Canadian government subsidizes electric exports to the United States, the government dumps electricity at below rate, and it results in lost jobs and State revenue.

So my question—perhaps it's to you, Ms. Harbert—should the new NAFTA negotiations—and I would encourage those negotiations to take place—address this unfair market distortion?

Ms. HARBERT. Sure, and one thing to point out, when we negotiated NAFTA the first time around, energy wasn't even part of the equation. We didn't know how much we had, Canada had, Mexico had. We didn't anticipate the fully integrated energy economy that we have today.

So, you know, as we proceed in the fifth and sixth and, hopefully, conclusion of this, there are issues like that that should be discussed.

But at the same time, we also have to realize that in the Pacific Northwest of our country, we are exporting a tremendous amount of hydropower up into Canada, and some of those are from Government-owned facilities as well—back to the, you know, the TVA days and all of that.

So, you know, it's something that should be looked at. That is not particularly my exact area of expertise, but I think it should be talked about. But it probably floats on both sides of the border that we would have to consider that—the equation.

Mr. MCKINLEY. Anyone else on the panel have comments about the subsidized——

Dr. KRUPNICK. Sure. I think subsidies to renewables, subsidies to fossil fuels—anywhere you see subsidies, there's a case for eliminating them. All that I think it's important is that, if we are eliminating subsidies on one type of fuel, we should eliminate them on others, as well.

And so, if Canada is subsidizing their hydro, then that's an issue that should be taken up.

Mr. MCKINLEY. Mr. Thompson, anything? Any comments?

Mr. THOMPSON. Well, this was certainly out of, you know, my area of expertise, but I will say this speaks more broadly to the

reasons that we need a separate, more complex title than NAFTA dealing with the energy issues.

As Karen said, we need to—at the time NAFTA—when it was originally developed, these issues weren't in front of us, and we need to because——

Mr. MCKINLEY. OK, because, according to these same reports, they're saying that we're ultimately going to be a net importer of electricity—the PJM from Canada.

So I am interested to know whether or not something like this in a NAFTA agreement should allow for some kind of cost recovery or tariff, if I use the T word. Any thoughts?

Mr. BURCHETT. As a final statement, from an ABB standpoint, we are a technology provider, so we do the high tech, and what I will tell you about those interconnects is the power can flow both ways.

So I don't know what the potential there is in the future. From a subsidy standpoint, I have no point of view. But I know the technology can go both ways.

Mr. MCKINLEY. OK. I yield back.

Mr. OLSON. The gentleman yields back.

The Chair now calls upon the gentleman from the same home State as our chairman, who wants me to say publicly I recognize that Michigan beat Texas in basketball yesterday, 57 to 52.

Mr. Walberg, you have 5 minutes.

Mr. WALBERG. With that kind introduction, Mr. Chairman, I won't add anything to it. Great basketball game.

Mr. OLSON. Thank you.

Mr. WALBERG. Ms. Harbert, thank you for being here, and thanks to each of the panel members for being here.

Many people think energy, and they think oil and gas. What other industries benefit from North American energy trade?

Ms. HARBERT. Well, I like to say that every one of our 50 States is in the energy business. You may not be producing it, but you're in the supply chain, and obviously we are all consumers.

So, with a more integrated North American energy market, all of our consumers—our families are benefiting, our industries are profiting—not profiting, but are benefiting from lower prices.

And let's not forget that industries have moved back to America. The fertilizer industry is back, helping your pork and beans and et cetera, and corn. The petrochemical industry is back in the Gulf that used to be in the Middle East. The steel industry is back in some form or fashion in Pennsylvania and Ohio.

So manufacturing is back, and critical inputs to our manufacturing are back. So it is an energy revolution in all 50 States.

Mr. WALBERG. And I think that's important for us to get out very clearly. We often think of energy in combative terms at times—it's not in my back yard—and the impact is sometimes forgotten, as well.

So, for us here in Congress, and policy to think along those lines, but also the industries, to make sure that we broadcast it, assist in the long haul.

Ms. Harbert, the low cost of natural gas and electricity is driving a revival in U.S. manufacturing and providing our economy with a competitive advantage.

However, free trade and market principles also allow producers of energy commodities such as natural gas and LNG to export their commodity abroad.

How do we strike the right balance so that everybody, including U.S. consumers, can reap the positive economic benefits?

Ms. HARBERT. Well, natural gas is real great story for America. We are producing more natural gas than we can consume, and, in order to continue to produce at that level, they need export markets, and that's what guarantees lower prices in those industries that are coming back.

We have additional capacity being planned into Mexico that will be good, because Mexico will then stimulate additional demand for our natural gas by developing new industries and new consumers.

So having more than we consume is a good thing. They're not going to sell it at the expense of domestic industry. They're getting all that they need, but, in order to keep those prices low for that domestic industry, we want to be able to export.

Mr. WALBERG. OK. Not a zero sum game, then?

Ms. HARBERT. No.

Mr. WALBERG. OK. Dr. Krupnick.

Dr. KRUPNICK. During the debate over LNG licensing for export, there were many studies done on what the effect of those exports of natural gas would be on U.S. domestic prices, and the best ones of those clearly said that there would be very little effect on prices.

With the shale gas revolution, we have such rapid response ability now in the fields to even small changes in prices, with increased supply that we are in a new era, and I don't think we have to worry about increased exports of our natural gas.

Mr. WALBERG. Thank you.

Mr. Thompson, what types of opportunities are opening up for American companies with Mexico's energy reforms?

And we often talk about hydrocarbons, but what about electricity?

Mr. THOMPSON. Well, I can't speak to electricity. That's not what my members do.

But I can speak to, with the opening up—the liberalization of their downstream sector, we have a number of companies that are now entering the Mexican market.

Andeavor has opened up the first Arco station in Mexico, and they're supplying fuel from their refinery in the State of Washington.

Valero now has entered into agreements to provide products—ExxonMobil, BP, Chevron. So we have a lot of U.S. companies now that are entering Mexico to supply needed fuel to the Mexican economy.

Mr. WALBERG. Thank you, and Mr. Chairman, I yield back.

Mr. OLSON. The gentleman yields back.

The Chair now calls upon the gentleman from Ohio, Mr. Latta, for 5 minutes.

Mr. LATTA. Well, thank you very much, Mr. Chairman, and thank you very much for our panel today.

You know, if I could follow up from my friend from Michigan, Ms. Harbert, when we were talking about the shale revolution because, of course, in Ohio what we have seen happen on the eastern side

of the State and also in western Pennsylvania, when you look at the Utica and the Marcellus Shale, it has created a revolution out there with wide-ranging benefits to the economy, and when you're looking at the creation of millions of jobs at a time when, you know, things are struggling out there.

But overall, how has the consumer benefited from this revolution that we've seen out there, right here at home?

Ms. HARBERT. Well, it's an American supply chain that has jumped in and fulfilled, making new products to fuel that revolution, which means more jobs, and for the American consumer prices are—low natural gas prices here have saved the American family money.

Over the last 6 years, prices have gone down by about 14 percent for energy for a family, which provides additional purchasing power, which stimulates the economy.

In addition, if we were able to get more pipeline capacity out of the Marcellus and into the Northeast, those consumers up there would benefit from low natural gas prices as well.

So it's jobs, it's new industries, it's low prices, and we are being more competitive with our exports overseas because our prices are 2 to 4 times lower than they are in Europe, which is a good thing. So we are more competitive on the global stage because of these low prices.

Mr. LATTA. Yes. Well, thank you very much.

And Mr. Burchett, our electrical systems are evolving rapidly with the technological innovation and regulatory policies that's driving the change. In your view what does the grid of the future need to look like in order to deliver electricity more efficiently and more cost effectively?

Mr. BURCHETT. So, when we think of the future grid, as we are working with most of the investor-owned utilities and our customers, I mean, we know the words "reliable" are there. We know the words "renewable" are there.

But we also, when we look at power generation, we view it as an all-of-the-above situation.

Our future does have solar, wind, but also coal and nuclear—traditional generation. If you look at studies from EIA, out for the next 30, 40 years, you still see all the different fuel elements in play.

With the technology in play, there's more around a distribution grid in the automation and being able to fully automate the grid so that, when an occurrence occurs you get—the interruption and restoration of power happens almost immediately.

Mr. LATTA. Thank you very much.

Mr. Thompson, with the huge increase in domestic production, our imports have, you know, fallen dramatically, as is being discussed. We've cut OPEC imports in half in less than a decade. How has our energy security situation changed as a result of the North American energy trade?

Mr. THOMPSON. Well, thank you for the question.

So as you noted, our domestic production is near all-time highs, and so we are more energy secure than we have been in quite some time.

Now, that certainly hasn't eliminated our need to import crude into our country, and that's more because our facilities are configured to handle the heavier crudes.

So we are able to take our lighter crudes and export them to facilities that are better designed and equipped to handle those. But we've been able to get more of our crude from our friends up north in Canada, and 41 percent of all of our imports come from Canada, and that's a good thing.

And as the IEA said, that we are all on track here as North America to be energy secure by 2020.

Mr. LATTA. Well, thank you very much.

And Mr. Chairman, I yield back the balance of my time.

Mr. OLSON. The gentleman yields back.

The Chair now calls upon the gentleman from Illinois, Mr. Kinzinger, for 5 minutes.

Mr. KINZINGER. Well, thank you, Mr. Chairman, and I know there's—based off of the last question, I do want to make the point that I think energy security is essential, not just for our economy, which is great, obviously, and important, but also because a lot of foreign actors use energy as a weapon, and I think it's essential to note that, if the West is ever going to fight back against some of the policies of the East or Russia, it's essential that we have a very strong energy platform to do so, because the Russians in many cases use energy as a weapon to try to extract political favors from foreign actors and foreign governments, and I think that's an essential point to know.

Ms. Harbert, since NAFTA was originally negotiated, Mexico has instituted a number of reforms, including opening its energy markets.

What do these reforms mean for consumers in our country?

Ms. HARBERT. First of all, I just want to underscore what you just said, which is the national security dividend of our energy revolution is enormous—that we are able to provide exports to allies who have been forced into choosing a single source for their oil or for their natural gas. So providing that choice provides national security for them and for us, providing choice.

The opening up of—the reform of the hydrocarbon sector in Mexico, which took a very long time and some courageous political actors to do, has been an open invitation for American companies, because they did the reform right and they're continuing to improve it.

And so we've already had several lease sales there, and there's one that's going into deep water, and our companies that have the best technology around are going to be the ones bidding on it.

So that, from an environmental standpoint, is very important. But also, as we have all of our resources flowing across borders in North America, which makes that energy market more efficient, it keeps prices low—electricity prices, fuel prices, natural gas prices—and it's stimulating that manufacturing revolution that's putting more Americans back to work.

Mr. KINZINGER. And so you mentioned a little bit about future bids and technology. What are new opportunities that you see to engage Mexico's energy sector further?

Ms. HARBERT. Well, they're sort of threefold at the moment, and all of them are ongoing and in rapid fire, which is cross-border electricity, which has—we've had that for a while, but now there's a lot more demand on the Mexico side, so more interconnected electricity.

Natural gas—we have a lot of American companies that are building pipeline right now, right at the border, waiting to go across, and that will stimulate more demand for our products under NAFTA because they will have a bigger middle class that can purchase our products.

And then there's offshore, which I think, between the North Sea and the Gulf of Mexico, those are the most advanced companies ever. So we should take great comfort, and that is our companies that will be investing in the Gulf of Mexico and these tricky deep shore——

Mr. KINZINGER. And what do we do to ensure that the renegotiations won't have adverse consequences on our energy industry?

Ms. HARBERT. Well, one of the most critical things that we are looking at is the investor protections that have been provided for and need to be maintained.

So the Mexican energy economy is reformed—that's bright investment. Investment likes some certainty, and so two things could upend that, which would be a withdrawal from NAFTA or something that jeopardizes the—a NAFTA that does not have the investor protections.

And so we as the business community are united, and those investor protections need to be maintained in any type of modernized NAFTA.

Mr. KINZINGER. OK.

Mr. Burchett, in your testimony you provide examples of how ABB's supply chain spans North America, including a supporting number of manufacturing sites in the U.S.

As you say, the U.S., Canada, and Mexico do not simply trade with each other—we build things together and rely on each other's markets to support millions of jobs.

How can we ensure that NAFTA renegotiations won't have adverse consequences on ABB and similar U.S. manufacturers that have robust trade cooperation through North America as a central part of their business?

Mr. BURCHETT. Yes, that's from an ABB perspective. From the National Association of Manufacturers, we are also now talking 14,000 small, medium, and large businesses that have similar levels of integration with Canada and Mexico, right.

And quite simply, when we look at what needs to happen, for manufacturers we obviously do a lot of investment. So the consistency, the stability, the lack of volatility allows us to make those assessments, and these low trade barriers. So it's a pretty simple formula for us. Investment likes consistency.

Mr. KINZINGER. Yes. And with my 20 seconds left, I yield back, Mr. Chairman. Thank you all for being here.

Mr. OLSON. The gentleman yields back.

The Chair now calls upon the gentleman from South Carolina, Mr. Duncan, for 5 minutes.

Mr. DUNCAN. My son tore an ACL on Sunday, Mr. Chairman, and he had a doctor's appointment so I've been Face Timing and trying to inform his wife on what's going on. So I appreciate it.

As you can see, I am sitting down here. I've been in the Congress for 7 years, but I am the newest member on this committee.

Before I came to the E and C, I chaired the Western Hemisphere Subcommittee, and I held numerous hearings on energy issues in the Western Hemisphere, specifically focusing on Canada and Mexico in a lot of those hearings.

Yesterday, the House passed H.R. 357, reaffirming its strategic partnership with Canada, and when I think about the inner connectivity between Mexico and Canada—some of the testimony that's been given today—you know, Canadian oil coming to America refineries, producing petroleum products that are then exported from the U.S. back to Canada and Mexico, and really other parts of the world. It is a strategic alliance there.

But when I think about Mexico, natural gas pipelines providing natural gas to Mexico, oil coming back to U.S. refineries, there is tremendous interconnectivity there.

But it goes beyond North American strategic alliance. I used to talk about American energy independence. Then I talked about North American energy independence, and I really broaden that to hemispheric energy independence, because if you think about Canada and Mexico and you think about the energy renaissance in this country and our ability to export an abundant natural gas through LNG, then you think about the needs in this hemisphere.

You think about the Caribbean nations that are relying on Venezuela and the Venezuelan situation. That's opportunity for Americans and American businesses and the oil and gas industry.

But there are other opportunities where American technology can be exported. When we think about energy exports we just think about product.

But we have fracking technology and other downhole technology that can be utilized offshore, say Guyana, which just discovered a tremendous oil field—32 trillion cubic feet of natural gas, not counting the oil.

I don't have that number right off the top of my head. But it's an abundant find. American technology, both onshore and offshore, can be exported within this hemisphere.

So I want to ask Ms. Harbert, because you seem to have a lot of knowledge about global energy initiatives, what are other opportunities that American industries can take advantage of? Because we are a leader in the energy area.

Ms. HARBERT. Well, you're absolutely right, and the countries in Latin America, save for Venezuela—Argentina, Peru, Brazil—they have welcomed American investment in the energy sector because they know we have the best technology and the best techniques available.

We've been able to develop gas in Peru. We've been able to, with some hiccups along the way, be big investors in Argentina, and the demand in Latin America as a developing world is going to go up.

And so the opportunities for us to invest in some of those repositories in Latin America but also to export from America is huge, just like it is in Africa.

Africa is going to be an industrializing part of the world, and we want to be part of that industrialization through energy as a foundation for it. They don't have all the energy they need.

So the opportunities, if you look at the International Energy Agency forecast, the demand for fossil fuels not only is constant but goes up, and we will provide fossil fuels. We'll provide 80 percent of all the world's energy resources in 2050. So huge opportunities to export, way beyond just North America.

Mr. DUNCAN. Mr. Thompson, are our refining capacity and refineries ready to receive, say, Guyanan oil for refining, so that those products can be shipped around the globe?

Mr. THOMPSON. Yes. We have the capability to take crude from all around the world, and most importantly we look forward to the opportunity to export products back to the rest of the world.

You know, last year we exported 72 billion gallons, and with the U.S. transportation fuel demands staying relatively flat now, we need those export markets.

Mr. DUNCAN. Right.

Mr. Chairman, in the remaining time I want to point all the committee members and the panelists to a Wall Street Journal article today, I believe: "Fracking Our Way to Mideast Peace." It's worth reading, and with that I yield back the balance.

Mr. OLSON. The Chair thanks the gentleman and yield back.

The Chair now calls upon the gentleman from Texas, Mr. Flores, for 5 minutes.

Mr. FLORES. OK. Thank you, Mr. Chairman. I appreciate you holding this hearing, and I appreciate the panel for joining us today.

When NAFTA was negotiated, Mexico's energy sector was largely closed to foreign investment. This is important to me because one of my firms did substantial energy activity in Mexico, and it was a very closed market. It was very arduous to deal in the energy space down there.

But in recent years, as you have heard, I mean, Mexico has opened up their markets and they've shown real leadership, and we have substantial trade activities that opened up just in a short period of time.

But in order for all of us—Canada, the United States, and Mexico—to take advantage of that market opening, U.S. companies need to have the certainty that their investments will be protected against government mistreatment.

The NAFTA renegotiation presents an opportunity to recognize Mexico's energy reforms and to maintain and strengthen NAFTA's investment protections, and this is why it's important.

Mexico is the number-one export destination for U.S. gas exports, making up 60 percent of Mexico's total gas supply. Most of that gas comes from my home State of Texas. Mexico is also the number-one export destination for U.S. petroleum products.

Half the gasoline U.S. refineries exported this year went to Mexico, and energy and production activity off the shore of Mexico is just starting, as well, creating new opportunities for U.S. businesses—many folks that are friends of mine that I used to do business with when I was in the energy business.

It's my understanding that the White House and the USTR are supportive of locking in these energy reforms, as is Mexico. Unfortunately, there are proposals in a NAFTA renegotiation that would undercut if not eviscerate important investment protections in NAFTA, typically via the well-recognized ISDS mechanism.

So, in light of the foregoing, here are my questions. Ms. Harbert, I believe that you touched on the importance of investment protection via the ISDS mechanism in your written testimony.

Will you please comment on the USTR's proposal to scale back investment protection, particularly the consequences for the energy sector? And Mr. Thompson, I will ask you the same thing.

Ms. HARBERT. Thank you for the opportunity.

You're absolutely right. Anything from the U.S. side that would seek to upend the certainty that is necessary to continue the investments brought about by the reform are certainly unwelcome, and I think they would have the following repercussions.

Number one, it would jeopardize that American investment, and that's what we are actually trying to protect. We would also jeopardize North American energy security.

Without having that free cross-border trade, we wouldn't have the benefit of both the import and export of energy from both of our trading partners, which would be a big setback to energy security.

We would also jeopardize North America becoming the center of gravity of the world's energy market, and that—we talked about OPEC here. I mean, we are going to just throw that away and let them become dominant again? That would be a huge national security issue for us.

And last but not least, let's not lose the fact that this would raise costs on the consumer, because if we are forced to only consume our domestic resources from North America and our producers don't have export, they're going to start producing less, and that really is a lose-lose for the American economy.

So, serious consequences. Those investor protections are fundamental, and they are present in all other trade agreements. I don't know why we'd want to make something new here.

Mr. FLORES. I agree. I agree.

Mr. Thompson.

Mr. THOMPSON. Yes. So I echo everything Ms. Harbert said. We have members that are investing at the moment hundreds of millions of dollars to enter the Mexican downstream market.

If you take away ISDS protections, it's going to jeopardize that. We need to make sure that the Mexican market stays open. We need an agreement that locks that in, and we need to protect our investors. It's critical that the ISDS mechanisms remain in NAFTA.

Mr. FLORES. OK. So, I mean, just simply, I mean, to put it this way: On one hand the White House says, "We believe in energy dominance for our country and for North America." On the other hand, the USTR is undercutting that by any conversation about getting rid of the ISDS mechanisms. Is that a simple way to put it?

Ms. HARBERT. And we hope through continued discussions that they can understand how important it is, for all the reasons I articulated.

But at the end of the day, if we are trying to protect American investors, let's not take away the thing that protects American investment.

Mr. FLORES. Exactly. OK.

Thank you, Mr. Chairman. I yield back the balance of my time.

Mr. OLSON. The gentleman yields back. The Chair now calls upon the gentleman from the Commonwealth of Virginia, Mr. Griffith, for 5 minutes.

Mr. GRIFFITH. Thank you very much, Mr. Chairman. Let me apologize to you and for the committee. I usually like to come and listen to everything, and today, because I've been in another committee hearing, I have been unable to do so. But your testimony is important, and we appreciate you being here today.

So I have no problem with this trading with our friends, north and south. But there needs to be, I believe, a more balanced and fair deal between our respective countries.

My district in southwest and south side Virginia was devastated by NAFTA, and we lost tens of thousands of jobs. You know, back when that was all going on, there would be a press conference and 3,000 people would be out of work.

We didn't get those jobs back. That was textiles, predominantly. We also have a heavy dose of coal in my district, and it shows me part of the problem we have with NAFTA.

A lot of the coal mining in Mexico—and we are not importing a lot, but we do some. But that's not the issue. The point is, they have coal mines there. But a large part of their coal industry is now controlled or managed by elements of their drug cartels, and the working conditions are horrible.

But we are supposed to be considered equals, and the same problem happens with all industries. So what do we do in areas that have been devastated, like my district, where the jobs never came back? The help from the Federal Government was never there to rebuild our economy, and I am dealing with communities that have parts of their downtown that used to flourish, they're now—you know, there's a block I am thinking of in particular that's just empty.

All of the stores are gone. It's not like a shell of itself. It's just not there. It's a ghost part of that community. Part of it's surviving, but just barely. Part of it's doing better.

How do we solve that problem? As we look at making a better deal, how do we rectify when you have disparities in working conditions, disparities in regulations, that then make the American product uncompetitive against our colleagues and our friends in the south who don't have those rules?

And some went to Canada, but they're more like us in the regard of their regulations and rules. Who wants to handle that?

Ms. HARBERT. Well, I will take a stab at one part of that—two parts of it.

First, I do think it's important to recognize that coal exports are on the rise in America, and 13 percent of all of our coal exports are going to Canada and Mexico—predominantly Mexico, right. So they

are a good and important and potentially growing destination for our coal exports.

On the relocation of industries, I think that is why we find ourselves back at the table, that we want to update and modernize NAFTA from where it was 30-some-odd years ago and that there's an opportunity to open up some of these things and look at that, and it's complicated.

And if you have ever been in a trade negotiation, if you come out with—the acronyms they use are mind boggling. And so I think that's the reason we are at the table. At the end of the day, there are going to be industries that choose to move for economic reasons. That has been the history of free enterprise and capital markets and free trade.

But there are things that we are looking, you know, at the coal industry in particular. We have the Appalachian hub that's going to be built, a new ethylene storage hub in Appalachia that will take some of those coal miners and put them to work in something else.

Mr. GRIFFITH. Where in Appalachia is that going to be?

Ms. HARBERT. Well, that's a great question, and that's up for the industry to decide and those—and all of the States in Appalachia to say what makes the most sense. But at the end of the day, it will benefit that region and provide sort of a relief valve for some of the miners that lost their jobs.

But it's not just NAFTA. I think we have to realize it's robotics. It's artificial intelligence. It's mega, you know, data. It's all kinds of things that 21st technology has brought us that make moving around a little bit easier.

Mr. GRIFFITH. Well, let me just say, I actually believe that, if we could get some of our textile industry back, it would mostly be robotics. But that would still be some good, high-paying jobs.

But when we lost those jobs 20 years ago, 25 years ago, it was all based on regulations and wages, and it just disappeared. In a matter of a couple of years, we went from being vibrant to having been crushed. We made a bad deal. We got to fix it.

Thank you. I yield back.

Mr. OLSON. The gentleman yields back.

The Chair now calls upon the gentleman with the Bakken Shale Play in his home State of North Dakota, Mr. Cramer, for 5 minutes.

Mr. CRAMER. Thank you. Thank you, Mr. Chairman. We are known for lots of other things, as well. A lot of food.

First of all—and I am sorry I had to step out for a little bit—but this has been a really good hearing. All of you, tremendous job. Thank you. Very well done, and I share all of your concerns with what's going on with regard to NAFTA.

And it's particularly in the energy area—and I am concerned about some other things, too, but the energy area being sort of new, if you will, since NAFTA was first passed to seek to present so many opportunities.

But here's an opportunity I want to raise just sort of rhetorically and then get your responses to it. And, by the way, I am going to be sort of fuel agnostic on this.

I really don't think the fuel matters. I think that what matters is whether it's intellectual, whether it's fossil, whether it's technology—just there's so much opportunity.

But we talk a lot about trade with one another, you know, the big three of us, and we are all important to each other. As I like to tell my Canadian friends, however, "As important as you are to us, we are critical to you. So we have a leverage that you don't, and always remember that." And our President understands that very well.

So anyway, but here's what I think we miss so oftentimes in the discussion that I wish we could get to. Just as sure as all the statistics you have shared in terms of how much we trade with one another and what—a large percentage of our business with, you know, the other two—Mexico and Canada—I think somebody said that the next 10 added up, don't add up to what—in certain areas what Mexico and Canada add up to for us in terms of market.

What I get enthused about is the opportunity as a bloc—as a seamless—and by the way, when I was sitting here earlier, I pulled up—one of my favourite maps in the world is the North American petroleum products pipeline map.

It knows nothing of borders, and I remember the first time we reversed a pipeline in North Dakota, that instead of bringing, you know, Canadian crude down we went Bakken crude up on the very same line. Just not necessarily even to get it to Saskatchewan but perhaps to get it to the Gulf Coast. I mean, that's how important that infrastructure is. So I appreciate all the emphasis on infrastructure.

But I would love to just hear some comments and maybe beginning with you, Ms. Harbert, and all of you could, if you have an opinion.

But what's the potential opportunity from an economic security as well as a national and energy security opportunity? If we as a bloc get our act together, harmonize everything we are talking about, and then who needs OPEC, right? I mean, that's how I view it.

So just open it up for discussion.

Ms. HARBERT. Absolutely. The national security dividend of this should not go unnoticed in the energy sector. First, from an American standpoint, we are importing more oil from Canada and Mexico than we are from OPEC, and so that's been a change in energy fortune, for sure.

And the opportunity to fully develop the resources of Canada, the United States, and Mexico and become the center of the world's energy market, which would send shock waves into not just OPEC but Russia sort of warms my heart.

Mr. CRAMER. Yes.

Ms. HARBERT. So I think that we shouldn't lose—this is not just an economic negotiation. This is a national security negotiation, as well, because the stronger we are, the more competitive we are on the world's stage as a bloc, if you will, but also from an energy standpoint, the more energy secure we are, the more national secure we are, and that provides our allies with choices of where they can get their oil, their gas, their technology. They probably can't

import their renewables, but there's growing renewables within our bloc, and it's a tremendous win-win.

Mr. CRAMER. Mr. Thompson.

Mr. THOMPSON. Well, let me say without sounding too corny, I mean, I think it would give us lots of things. It would give us unprecedented freedom in North America—freedom, and to take away the leverage that the rest of the world or certain parts of the world has over us now.

It will give us prosperity. Our nations will prosper. Our employees will prosper. Our consumers will prosper. We'll continue to benefit from low oil prices and low gasoline prices and good, high-paying jobs. We can become an energy-dominant region.

I think the possibilities are endless. We should all be, you know, trying to get there.

Mr. CRAMER. Doctor?

Dr. KRUPNICK. In our report to the Department of Energy on these issues, we call very strongly for thinking about ways of moving towards this bloc—a concept that you're talking about, and we talk about that, as well.

So I think the way to move forward on this is to give DOE responsibility and the charge to develop pathways for the future. What are the current challenges? How deep do you have to go in environmental policy and tax policy to make all this a reality?

You know, I am amazed at how much agreement there is about moving in this direction, and it's great. But someone needs to think through it carefully.

Mr. CRAMER. Thank you.

Mr. OLSON. The gentleman yields back. The Chair thanks him for bringing up the bloc we call NAPEC—North American Petroleum Exporting Countries.

And seeing that there are no further Members who wish to ask question, I would like to thank all the witnesses for being here today.

Merry Christmas. And pursuant to committee rules, I remind Members that they have 10 business days to submit additional questions for the record and ask that all witnesses submit their responses within 10 business days upon receipt of those questions.

Without objection, this subcommittee is adjourned.

[Whereupon, at 12:14 p.m., the committee was adjourned.]

[Material submitted for inclusion in the record follows:]

PREPARED STATEMENT OF HON. GREG WALDEN

The United States' abundant energy resources are a major contributor to our Nation's continued economic growth and job creation. When it comes to cross border trade among the United States, Canada, and Mexico, energy is a key component, and I think we can all agree that ensuring the reliable supply of fuels and electricity is vital to our Nation's security, economy, and public health.

In my home State of Oregon and across the country, our Nation's energy abundance enables every aspect of our daily lives, from telecommunications, to financial transactions, to powering the infrastructure that delivers our drinking water. Energy enables business and industry to make and provide the goods and services of our modern society. It powers our hospitals, our households.

Advances in transportation, the growth of manufacturing, and technological innovation have opened the door for an integrated North American energy market, resulting in more dynamic and connected energy systems and more competitively priced energy for American consumers.

Cross-border energy infrastructure—which includes pipelines for oil and natural gas and transmission lines for electricity—enables the movement of energy across the continent. These cross-border pipes, poles, and wires, are the super highway system for North America's fuels and electricity. Clearly, if we want robust energy trade with our neighbors then we must have the necessary infrastructure to support that trade, which is why this committee, and the House of Representatives, recently passed Mr. Mullin's bill, H.R. 2883, the Promoting Cross-Border Energy Infrastructure Act, which improves the permitting and siting process for all types of cross-border energy infrastructure. When it comes to North America's "energy highway," I think it is safe to say that we want to add more lanes, not less, making it easier for the United States to engage in beneficial trade with Canada and Mexico.

In addition to the infrastructure that enables trade, we of course must also have strong trade agreements in place to facilitate fair and favorable trade across North America. It is worth noting that this hearing we are holding today is especially timely, given the fact that the administration is currently in the midst of renegotiating the North American Free Trade Agreement, an agreement that has been critical to furthering and promoting energy trade between America and its neighbors.

In terms of trade with our neighbor to the north, those of us in the Pacific Northwest are paying close attention to the upcoming renegotiation of the Columbia River Treaty. Just last week, the State Department and the Canadian government announced that both nations will meet early next year to hammer out the details of this river treaty, which has been in effect since 1964. With its headwaters in British Columbia, the Columbia River winds its way through Washington and Oregon before emptying into the Pacific. Along the way, this resource has a major effect on everything from fishing and flood protection, to power production and recreation—the importance of this Treaty cannot be understated in terms of commerce and trade. However, over the past 53 years, some of the provisions have become out of date particularly with respect to the electricity rates paid by consumers in the Pacific Northwest. That said, it will be important for both nations to reach an agreement to continue to share this valuable natural resource.

I want to thank the witnesses for being here today to discuss the important topic of cross-border energy trade. This hearing will further inform the committee's ongoing oversight and legislation reforms that build on our Nation's energy abundance, modernize our energy infrastructure, and promote domestic manufacturing and job growth.