

NEAL R. GROSS & CO., INC.

RPTS WALTER

HIF177030

THE SHIFTING GEOPOLITICS OF OIL AND GAS

TUESDAY, JUNE 26, 2018

House of Representatives

Subcommittee on Energy

Committee on Energy and Commerce

Washington, D.C.

The subcommittee met, pursuant to call, at 1:00 p.m., in Room 2123 Rayburn House Office Building, Hon. Fred Upton [chairman of the subcommittee] presiding.

Members present: Representatives Upton, Olson, Barton, Shimkus, Latta, Harper, McKinley, Kinzinger, Griffith, Johnson, Bucshon, Flores, Mullin, Hudson, Walberg, Duncan, Walden (ex officio), McNerney, Peters, Green, Doyle, Welch, Tonko, Kennedy, Butterfield, and Pallone (ex officio).

Staff present: Mike Bloomquist, Deputy Staff Director; Samantha Bopp, Staff Assistant; Karen Christian, General Counsel; Kelly Collins, Legislative Clerk, Energy/Environment; Wyatt

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

26 Ellertson, Professional Staff, Energy/Environment; Margaret
27 Tucker Fogarty, Staff Assistant; Adam Fromm, Director of Outreach
28 and Coalitions; Jordan Haverly, Policy Coordinator, Environment;
29 Bijan Koohmaraie, Counsel, Digital Commerce and Consumer
30 Protection; Mary Martin, Chief Counsel, Energy/Environment;
31 Sarah Matthews, Press Secretary; Drew McDowell, Executive
32 Assistant; Brandon Mooney, Deputy Chief Counsel, Energy; Mark
33 Ratner, Policy Coordinator; Annelise Rickert, Counsel, Energy;
34 Peter Spencer, Professional Staff Member, Energy; Austin
35 Stonebraker, Press Assistant; Madeline Vey, Policy Coordinator,
36 Digital Commerce and Consumer Protection; Hamlin Wade, Special
37 Advisor, External Affairs; Caitlin Haberman, Minority
38 Professional Staff Member; Rick Kessler, Minority Senior Advisor
39 and Staff Director, Energy and Environment; John Marshall,
40 Minority Policy Coordinator; Alexander Ratner, Minority Policy
41 Analyst; Tuley Wright, Minority Energy and Environment Policy
42 Advisor; and Catherine Zander, Minority Environment Fellow.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

43 Mr. Upton. Good afternoon. Sorry we are a little delayed
44 in starting but we had three votes on the House floor and they
45 are just finishing up. And so we will get started.

46 So, good afternoon, and, certainly, welcome to this Energy
47 Subcommittee hearing on "The Shifting Geopolitics of Oil and Gas."

48 So this hearing is especially timely because here in D.C.,
49 right now, energy ministers and CEOs from around the world are
50 gathering for the 27th World Gas Conference to examine important
51 opportunities in energy trends happening across the globe. And
52 while it's an international conference for sure, the U.S.'s role
53 as a world leader in energy is sure to be the focus.

54 So, before we arrived at this current era of energy
55 abundance, some of you may remember that as little as a decade
56 ago America's energy landscape was in a lot different state than
57 it is today.

58 In 2005, American domestic oil and gas production was
59 declining and the country reached a point of peak reliance on
60 foreign sources of energy, and at that time we were importing eight
61 times more energy than we were exporting and we were becoming
62 increasingly dependent on OPEC nations for our energy needs.

63 It was right around that time that this important
64 technological breakthrough pioneered by American companies --
65 namely, horizontal drilling and hydraulic fracturing --
66 dramatically altered our energy outlook.

67 These technological breakthroughs led to a surge in domestic

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

68 oil and gas production, decreasing U.S. reliance on energy
69 imports.

70 As for today, and we will see that this trend has not slowed
71 down -- in fact, energy -- EIA projects that by 2022, the U.S.
72 will become a net energy exporter for the first time in over half
73 a century.

74 It should be noted that America's emergence as a major energy
75 supplier to the world is thanks, in part, to Congress' lifting
76 the 40-year-old crude oil export ban in 2015, and I would note,
77 that was bipartisan. President Obama signed it into law.

78 Removing the ban has enabled our companies to take advantage
79 of global energy markets and has resulted in more American jobs
80 for sure, a stronger economy for sure, lower emissions, indeed,
81 and it's helping to reduce our trade deficit.

82 The national security and energy security benefits provided
83 by the shale energy revolution cannot be overstated. Every day,
84 we are less dependent on foreign nations and cartels, such as OPEC,
85 to meet our domestic energy needs.

86 Instead, we are now employing American workers and American
87 technologies to harness our own standard and abundant domestic
88 resources in a way that is growing the economy, protecting the
89 environment, and improving our energy security.

90 So today we are holding this hearing to take a closer look
91 at how the U.S.'s growing role as a global energy leader is
92 benefitting consumers and enhancing the nation's standing on the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

93 geopolitical world stage.

94 To provide insight on these topics, we have a great panel
95 of four witnesses with extensive experience working in and around
96 the U.S. oil and gas industry.

97 As part of today's panel we have Dr. Daniel Yergin, a Pulitzer
98 Prize-winning author and a world-renowned energy expert who many
99 of us say literally wrote the book.

100 Dr. Yergin is joined by Harold Hamm, the CEO of Continental
101 Resources, which is a highly successful oil exploration and
102 production company that he himself founded, and he had an
103 instrumental role in making sure that we lifted that crude oil
104 ban.

105 We also have Dennis Arriola, the chief strategy officer for
106 Sempra, a Fortune 500 energy services company that serves 40
107 million customers -- consumers around the world.

108 And rounding up the lineup, we have got Dr. Kevin Kennedy,
109 a deputy director at the World Resources Institute, a global
110 research organization that spans more than 50 countries and
111 focuses on the nexus of environment economic opportunity and human
112 wellbeing.

113 So I want to thank all of you for joining us, for twiddling
114 your thumbs for 30 minutes while we cast some mighty important
115 votes on the House floor, and I know yield to the acting raking
116 member of the subcommittee, Mr. McNerney, our friend from
117 California, taking Bobby Rush's place this afternoon, who's

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

118 getting married.

119 [The prepared statement of Mr. Upton follows:]

120

121 *****INSERT 1*****

122 Mr. McNerney. Getting married Saturday.

123 Well, thank you, Mr. Chairman, for yielding to me. I want
124 to thank the panelists, and I think you're all interesting and
125 I am looking forward to hearing what you have to say and I hope
126 we get very diverse set of opinions about the issues here.

127 It's important to have this conversation with industry
128 leaders and with policy leaders and with people that understand
129 the business.

130 We have world gas conference nearby and this is topical, but
131 the topic that's listed here -- the shifting geopolitics of oil
132 and gas -- is a little too narrow.

133 We should be including other topics like renewables,
134 storage, and other resources that are impacting our energy
135 markets. LNG and crude oil exports have changed in the last
136 decade.

137 When I first got elected in 2007, we were worried about our
138 dependence on foreign oil. That's changed. That's possibly a
139 good thing. But we continue to need a very diverse -- we continue
140 to need a very diverse energy mix. It won't help us, I don't
141 think, to depend -- become overly dependent on oil and/or gas.

142 We need political compromise to get there. If one side or
143 the other dominates, I think we are going to go down a path that's
144 unsustainable. So we need political compromise on this and all
145 the other issues including tax reform.

146 Renewables -- you know, the interesting things is that the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

147 energy market is really shifting to electricity now. We have
148 electric vehicles growing, especially in California but in other
149 states as well.

150 So we are going to see more and more and dependence on
151 electricity as a product. It's not necessarily a resource a but
152 as a product. So we need to be -- we need to have policies that's
153 going to support that shift.

154 We have energy storage, another thing that's going to be very
155 important in terms of shifting where we get our energy from.

156 Concerning the Paris agreement, the United States was a
157 leader in this agreement. We are still in the -- we are still
158 in terms of cities and states declaring that they are going to
159 continue to abide by the terms of the Paris Climate Accord. I
160 think that's very inspiring to me.

161 And I want to say to the witnesses, Dr. Yergin, your
162 scholarship has advanced the field of energy. I really
163 appreciate what you've been able to accomplish in terms of
164 providing the history.

165 And one of the things that strikes me about your scholarship
166 is that we see a cyclical market. The oil market goes in very
167 big cycles about every 10 or 15 years, and right now we are on
168 a low energy cost part of that cycle.

169 But I think that's probably going to change in a another five
170 years, based on history -- nothing more.

171 Mr. Kennedy, World Resources Institute climate initiative

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

172 is a the gold standard for providing advice. So thank you for
173 coming today.

174 Mr. Arriola, Semptra holds utilities in my home state and has
175 a diverse generation of energy assets here and abroad. I hope
176 it stays that way.

177 And Mr. Hamm, you have been a leader and I appreciate what
178 horizontal drilling has done to the energy markets in this
179 country. We need to keep an eye on that to make sure that it
180 doesn't cause problems in our states.

181 We know that there is problems with earthquakes. We know
182 that there is potential problems with groundwater contamination
183 and so on. So it's important to keep an eye on that.

184 At any rate, I am going to yield if any Democrats want to
185 take a minute or two, and with that I yield back to the chair.

186 Mr. Upton. The gentleman yields back. The chair
187 recognizes the chair of the full committee, Mr. Walden, for an
188 opening statement.

189 The Chairman. Thank you very much, Mr. Chairman. To our
190 panelists, welcome. Thank you for being here today and sharing
191 with us on these issues that are so important. We have an
192 excellent lineup of witnesses, Mr. Chairman, and we are going to
193 learn a lot.

194 This is, of course, a big week in Washington, D.C. It is
195 when America hosts the World Gas Conference. They call it the
196 Olympics of natural gas, and indeed, it is.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

197 It brings together hundreds -- actually, thousands of
198 participants in energy ministers and CEOs from global energy
199 companies to discuss strategic, commercial and technical issues
200 facing this really important American industry.

201 It's been 30 years. Ronald Reagan was president the last
202 time America hosted this and the energy picture was quite
203 different then than it is today.

204 So it's kind of interesting to reflect back on those times.
205 But today, the United States is the world's number-one producer
206 of petroleum and natural gas. Our markets are more open,
207 transparent, and competitive than they've ever been.

208 Prices for consumers are low and stable. There are always
209 ups and downs. But we have cut our imports by about 75 percent
210 since they peaked in 2005, and if this trend continues we will
211 be net energy exporters in just a few short years.

212 We got there by repealing the Jimmy Carter era supply and
213 price controls to encourage a free market for energy commodities.

214 We have taken steps to improve our regulatory policies --
215 we know we have a lot more to do there -- and reform our outdated
216 tax code to encourage domestic production.

217 Piece by piece, we have removed restrictions on energy trade
218 to allow American energy to compete in the global marketplace,
219 and Mr. Hamm's done a lot in that effort globally.

220 Most recently, as members on this committee will remember,
221 we repealed the 40-year-old ban on crude oil. Now, just two years

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

222 later, we are exporting more than 12 million barrels per day of
223 crude oil to countries around the world.

224 This is big. The shale revolution, now 10 years in the
225 making, has had an enormously positive impact on the economy.
226 It's created hundreds of thousands of jobs, billions of dollars
227 in investment that wouldn't have happened were it not for our
228 energy abundance in the United States.

229 The jobs and investments are widespread. They are across
230 all sectors of the economy in all 50 states. It's also had a big
231 impact on our power sector and with the shift to abundant and cheap
232 natural gas we have seen a huge reduction in our carbon emissions
233 -- enormous.

234 In fact, the U.S. is leading the world in reducing carbon
235 emissions, and by a large margin. Since peaking in 2005, our
236 carbon emissions have declined steadily and this trend looks
237 likely to continue.

238 This just goes to how you don't always need a government
239 mandate to get it done if you believe in the free market system
240 and innovation that comes from it.

241 We can do a lot of clean up the environment and create great
242 American jobs and develop American energy. So we are seeing these
243 benefits today, and as we emerge as the world-leading LNG
244 exporter, our trading partners will share in this good fortune.

245 The outlook for American energy is bright, with plentiful
246 reserves, a highly-skilled workforce, pro-growth regulations.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

Our energy production will continue to grow and, with this growth, America will see even greater economic, geopolitical, and environmental benefits along with additional opportunities to help our American allies abroad who are in need of reliable and affordable supplies of energy, not held hostage for their energy by less than friendly countries.

I'd like to thank the witnesses again for participating today and we appreciate you sharing your experiences, your knowledge, and your ideas with us about how we can continue to grow American jobs, develop American energy, and enjoy the economic and environmental benefits that come from that.

[The prepared statement of Chairman Walden follows:]

*****INSERT 2*****

261 The Chairman. With that, I've got a minute and a half left.
262 If anybody on our side wants to use that I'd be happy to yield.

263 Mr. Barton, former chairman of the committee, the vice chair
264 of the full committee, I would yield such time as you may use.

265 Mr. Barton. Thank you, Mr. Chairman. I, basically, just
266 want to welcome the panel. I know three of you personally and
267 the fourth one I am sure I'd love to know personally if I did.

268 So our committee, in the time I've been on it, starting back
269 when John Dingell was chairman, has led the Congress in energy
270 legislation, and we have gone from where in the '70s and early
271 '80s we were trying to restrict the use of things like natural
272 gas and put price controls on various things and our natural
273 resources because we thought that we were entering an era of
274 scarcity to the point where we are now in an -- I won't say an
275 era of surplus but in an era where we are on the verge of being
276 the dominant energy producer in the world and, you know, I think
277 that's a good thing, and you gentlemen have helped lead that
278 effort.

279 Of course, Mr. Yergin, he's probably the premier -- I won't
280 say statistician or historian but he's certainly one of the
281 leading experts in the world. So we are glad to have you
282 especially, sir.

283 And with that, Mr. Chairman, I yield back my two seconds.

284 The Chairman. I yield back.

285 Mr. Upton. Time is expired. The chair would recognize the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

286 ranking member of the full committee, Mr. Pallone from New Jersey,
287 for an opening statement.

288 Mr. Pallone. Thank you, Mr. Chairman. After nearly two
289 years of Republican control of all branches of government, my
290 Republican colleagues have little to show for their efforts, and
291 the little they have accomplished is benefitting the wealthy to
292 the detriment of the middle class and the vulnerable.

293 Just think about it -- skyrocketing health care premiums and
294 growing numbers of the uninsured, a widely unpopular Trump tax
295 scam, trillions of dollars in new and mounting debt, and now a
296 devastating Trump-inflicted policy that stripped thousands of
297 children from their parents.

298 So faced with the failure of their policies, Republicans have
299 started to retreat to their safe spaces, including proposing
300 draconian cuts to Medicare, Medicaid, and Social Security as part
301 of their new budget and now, of course, today's old favorite --
302 cheerleading for fossil fuels.

303 The latest version of this tired old story has Republicans
304 going so far as to trying to legislatively blackmail states like
305 New Jersey, that have stood up to the administration's oil above
306 all agenda, by imposing sizeable fees on any state that refuses
307 to rubber stamp President Trump's offshore drilling expansion
308 policy.

309 Early this year, New Jersey governor Phil Murphy listened
310 to our coastal communities and blocked offshore oil and gas

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

311 drilling in state waters.

312 The Jersey shore where I live is a priceless national
313 treasure that is an engine for our tourism industry that generates
314 \$38 billion a year and one of the largest recreational fishing
315 industries in the nation.

316 That's all threatened by offshore drilling, which will
317 destroy our coastal economy. We simply don't need to risk the
318 health and vitality of our coastal communities for the sake of
319 putting more fossil fuels into our energy mix.

320 We have seen this show before. First, rising gasoline costs
321 or something else moves us toward reducing our dependence on
322 fossil fuels. Then, in response, fossil fuel industry executives
323 come to Congress to tell us that the only solution to our problems
324 is to ramp up drilling and decrease restrictions on their industry
325 in order to increase supply.

326 That's happening today, as reckless Republican policies have
327 led to a significant jump in the price of gasoline since March.
328 In fact, the price of gas has gone up nearly 25 percent since
329 President Trump took office.

330 You'd think that would lead to an effort to support cleaner
331 less gas-guzzling vehicles. But that logic is lost on President
332 Trump and his ethically-challenged EPA administrator, Scott
333 Pruitt, who have gone completely in the opposite direction.

334 They have moved aggressively against clean cars and a diverse
335 21st century energy policy. Instead, President Trump has worked

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

336 tirelessly to put in place a 1950s approach to energy that only
337 an oil company could love and can best be summed up by the words
338 dig, drill anytime, anywhere, even if it's in our coastal
339 recreational waters.

340 Now, President Trump also made a foolish decision by
341 announcing his intention to withdraw from the Paris Climate
342 agreement. That was an agreement we spent years negotiating with
343 the global community and was signed by, roughly, 200 countries.

344 By abandoning our friend and allies, we have ceded our
345 leadership on climate action and clean technology development and
346 deployment to China, and others.

347 We were the global leader, but now we don't even have a seat
348 at the table. What does that mean? That puts America last and
349 is, tragically, shortsighted.

350 Republican "oil above all" policies have always centered on
351 one thing -- putting the profits of oil tycoons and fossil industry
352 donors first, and the current rerun of this cliched show should
353 have been cancelled long ago. But, obviously, it isn't.

354 I don't know if anyone else would like my time. If not, I
355 will yield back, Mr. Chairman.

356 Mr. Upton. I'd like to say the gentleman's time has expired
357 but I'll be polite.

358 [Laughter.]

359 The gentleman yields back.

360 So we are ready for the testimony. I appreciate all of you

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

361 sending up your testimony in advance. I was able to read it last
362 night.

363 It will be made part of the record in its entirety and you'll
364 each have five minutes to summarize that testimony and expound
365 how you might, and we will do questions.

366 And Dr. Yergin, you're first up.

367 Thank you. You got to hit that button to make sure that
368 you're on.

STATEMENTS OF DR. DANIEL YERGIN, VICE CHAIRMAN, IHS MARKET; DENNIS
ARRIOLA, CHIEF STRATEGY OFFICER, SEMPRA; DR. KEVIN KENNEDY,
DEPUTY DIRECTOR, U.S. CLIMATE INITIATIVE, WORLD RESOURCES
INSTITUTE; HAROLD HAMM, CEO, CONTINENTAL RESOURCES;

STATEMENT OF DANIEL YERGIN

Mr. Yergin. Mr. Chairman, acting ranking member, members
of the subcommittee, it's really an honor to be here and to have
the chance to talk about this just dramatic change that's happened
in the United States and what it means for our economy, for
geopolitics, and the position of the United States in the world.

As the chairman pointed out and Mr. Walden pointed out, the
World Gas Conference is here. It's 12,000 people from around the
world who have come to Washington.

I have just come over from it. The theme of this conferences
is fueling the future and now it's a very different future because
of the shale revolution in the United States, and that has been
one of the major themes.

This is, as was noted, the 10th anniversary, at least as we
see it at IHS Market, of what we have called the shale gale, which
was -- really changed the United States and the energy picture
to have profound consequences, although I think the scale of the
consequences would have been foreseen.

What's changed since 2008? Well, back in 2008, we were going
to be the largest importer of LNG in the world. Now we are on

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

394 the road to be one of the largest exporters and, indeed, as noted,
395 the largest producer of natural gas in the world.

396 As many of you know, for four decades energy independence
397 was the cry but we always were going in the other direction. The
398 question only seemed to be how high would our imports go.

399 But now in a decade, we have gone from importing on a net
400 basis 60 percent of our oil to 16 percent. Huge change.

401 Everyone knows that trade is a very big issue, so it's
402 noteworthy to observe that over this decade the change in the U.S.
403 oil position, along with changes in prices, has reduced the
404 nation's annual trade deficit by \$300 billion.

405 U.S. oil production has more than doubled in the decade, and
406 here's something striking. Next year, or maybe later this year,
407 the United States will become the world's largest oil producer,
408 ahead of Saudi Arabia and Russia.

409 It's been a major stimulus to the U.S. economy, not just in
410 the oil and gas sector, but because across the entire economy
411 because of long supply chains, and I would say in many states that
412 -- where shale is not permitted there are jobs that have been
413 created, we calculated 50,000 jobs in the state of New York because
414 of the shale revolution.

415 Industries that were supposed to flee the United States
416 because of high energy costs are now here in the United States,
417 spending tens of billions of dollars.

418 Also, this is having major geopolitical impacts that are

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

constructive for the United States. I can see it as I travel around the world how there is a whole new degree of influence that the United States has because of this revolution.

The turnaround in gas is just striking. The eight-year period of 2000-2007, total U.S. gas production grew by 1 percent. Over the subsequent 10-year period it's grown by 40 percent, and we believe that it will grow by another 60 percent over the next 20 years.

So where would we be without this? Without the shale revolution, the United States would be importing large volumes of oil and gas. Our trade balance would be dramatically different.

Millions of jobs would not exist and the United States would be less competitive. The domestic U.S. power markets and the overall economy would look significantly different without the shale revolution.

Similarly, the outlook would be different in terms of the global economy and international relations both for countries that produce oil and gas and for countries that import them.

I just came from a meeting of APEC countries and the role of the U.S. in terms of LNG is something that is now very important to those Asian countries.

Certainly, without the shale gale we would be in a different position internationally. This has brought a new element of influence and independence for the United States. It was so

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

444 evident this morning, and U.S. LNG exports are becoming a
445 significant and positive factor in relations with many countries
446 and a key issue in discussions about trade.

447 So this new outlook for oil and natural gas has created new
448 possibilities for making progress towards national goals of
449 energy efficiency, cost efficiency, environmental protection,
450 global competitiveness, and energy security.

451 It is also contributing jobs and revenues to the economy at
452 the national, state, and local levels. In short, the shale gale
453 has put a powerful new wind at America's back.

454 Thank you.

455 [The prepared statement of Mr. Yergin follows:]

456

457 *****INSERT 3*****

458

Mr. Upton. Thank you. Mr. Arriola.

STATEMENT OF DENNIS ARRIOLA

Mr. Arriola. Mr. Chairman -- Chairman Upton, Acting Ranking Member McNerney, and members of the subcommittee, thank you for this opportunity to testify regarding U.S. natural gas policy and how it affects our business.

My name is Dennis Arriola and I am the chief strategy officer for Sempra Energy and I also have responsibility for our external affairs in our South American operations.

Sempra, as you mentioned, is a Fortune 500 services company based in San Diego, California, and we have approximately 20,000 employees that serve more than 40,000 [sic] consumers around the world and we are the largest utility holding company with the largest U.S. customer base.

And our utilities include Southern California Gas Company, which is the largest natural gas distribution company in the United States, San Diego Gas and Electric, and Encore Electric Delivery Company in Texas.

And our energy infrastructure companies include our investments in Mexico that help import U.S. natural gas and petroleum products to that country and we have also have our Sempra LNG and Midstream business.

And as Dr. Yergin mentioned, the timing of this hearing couldn't be better as the World Gas Conference is here in our nation's capital, and with the global triennial next stopping in

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

the Republic of Korea and China, the conference this week in D.C. is the last time that the U.S. is going to have the opportunity to really help shape the discussion as the host country for years to come.

And I can tell you that the world truly is watching what's going on in Washington this week. The outlook for domestic and international natural gas markets has never been better because of two key developments, and one which Dr. Yergin mentioned -- the shale energy boom -- but also the opportunity to export U.S. liquefied natural gas, or LNG.

And we invest wisely and follow smart pro-market policies, there's little doubt that the U.S. will derive increased economic benefits, job growth, and even greater energy independence, and natural gas now serves as the leading fuel source for the industrial, commercial, and residential sectors of the U.S. economy.

And this increased consumption is providing for significant job growth, boosting the economy, and lowering air emissions, and natural gas is also ensuring greater energy security and prosperity globally as well.

Now, we own two and operate two LNG facilities and we are in the process of permitting a third. Our Cameron LNG is in Louisiana -- is under construction. We currently have 10,000 workers on site and when it's completed and starts operating in 2019, the facility is going to create approximately 130

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

509 well-paying jobs in an area that really will benefit from them.

510 We are also pursuing our FERC permit for an LNG export
511 facility located near Port Arthur, Texas, and again, this is going
512 to be employing over 3,100 construction and engineering jobs and,
513 on average over the four- to five-year period of build out it's
514 going to create more than 200 permanent well-paying jobs.

515 Both of these projects together could help reduce our overall
516 trade deficit by, roughly, \$16 billion annually, and these and
517 other export facilities are going to promote new pipelines and
518 maintain natural gas production for many states that are
519 represented here on the subcommittee, including Ohio,
520 Pennsylvania, New Mexico, Texas, and Louisiana, and it's also
521 going to help continue the current cost advantage that benefits
522 U.S. consumers.

523 Now, we have the potential to strengthen alliances with
524 developed and developing countries by providing a safe and
525 reliable resource to those countries.

526 But we've got to be able to build the infrastructure in this
527 country to do that, and the U.S. gas exports can also help our
528 European and Asian allies reduce their energy dependence on
529 Russia.

530 And if we are to benefit from this opportunity, we've got
531 to take advantage of it and the time is now, and one of the things
532 that we were looking for from this subcommittee is to, along with
533 the administration, figure out how we can expedite in a smart

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

534 manner the permitting processes that are required here in this
535 country to have that infrastructure, to help export good clean
536 natural gas from the United States.

537 These delays jeopardize commercial agreements with our
538 international trading partners and you can be sure that the other
539 major LNG-exporting countries are doing everything possible to
540 enhance their competitive position, and bureaucratic delays are
541 not one of the challenges they have.

542 So I think we need to work together as a country to take
543 advantage of this window of opportunity to make sure that when
544 you enter into these contracts these are 20- to 30-year contracts.

545 If we, as an American business community, can't get in on
546 time with these countries, we are going to get shut out and we
547 are not just shut out for a year -- we are shut out for decades,
548 and that means that the jobs that can be helping certain parts
549 of our country, the economic progress won't come about.

550 And so what we need is to ensure that FERC maintains its
551 typical permit review schedule of no more than 18 to 24 months
552 so that we can get this going.

553 Thank you.

554 [The prepared statement of Mr. Arriola follows:]

555 *****INSERT 4*****

556

Mr. Upton. Thank you. Dr. Kennedy.

STATEMENT OF KEVIN KENNEDY

Mr. Kennedy. Thank you, Chairman Upton, Mr. McNerney, other members of the committee. I am very pleased to be joining you here today for this hearing.

My name is Kevin Kennedy and I am deputy director for the U.S. Climate Initiative at the World Resources Institute. WRI is a global research organization that turns big ideas into action at the intersection of the environment, economic opportunity, and human wellbeing.

As Mr. McNerney noted, as we look at the energy landscape in the United States today, it's important not just to focus on the oil and gas industry but to consider the broader context of changes that are happening across the country.

America has seen significant progress on the development and deployment of clean energy such as renewables, resulting in large part from the leadership of states, cities, and businesses, often acting with the support and cooperation of the federal government.

When President Trump announced last year his intent to withdraw from the international climate agreement, some feared that this progress might slow.

On the contrary, that announcement catalysed continued and expanded commitment from states, cities, and businesses across the country.

Within days, over 1,200 leaders joined together to say we

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

582 are still in and committed to support climate action, and as of
583 this weekend, that declaration has been supported by over 2,800
584 leaders.

585 I have been a core member of the research team behind the
586 America's Pledge Initiative, which was launched last July by
587 former Mayor Michael Bloomberg and Governor Jerry Brown, to
588 document the full range of climate and clean energy actions being
589 taken across America.

590 Our report last November showed that leaders representing
591 almost half the population and more than half of the U.S. economy
592 have committed to bringing down their greenhouse gas emissions.

593 These leaders recognized that acting to support clean energy
594 and address climate change can go hand in hand with economic growth
595 and job creation.

596 While many of those signing declarations like we are still
597 in are doing so for environmental reasons. Others are acting
598 based primarily on the economic opportunities offered by being
599 leaders in clean energy.

600 They recognize that major countries around the world are
601 investing in renewables and other clean energy sources and the
602 global markets are shifting fast, and they want to see their
603 communities and the country lead rather than to follow.

604 This committee and Congress can be their partners in moving
605 ahead on renewables, energy efficiency, and other clean energy
606 sources. I want to share just a few of the stories today.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

607 In 2017, large corporate buyers in the U.S. like Google,
608 Kimberly-Clark, and General Motors, announced contracts for
609 nearly 2.9 gigawatts of renewable energy -- an 80 percent increase
610 from the previous year, and this year they've already announced
611 deals for almost 2.5 gigawatts -- almost matching last year's
612 total just six months in.

613 The Republican mayor of Georgetown, Texas, said one of the
614 most important benefits of being 100 percent renewable is the
615 potential for economic development. Many companies are looking
616 to increase their green sources of power for both office and
617 manufacturing facilities.

618 Mayor Ross added that the city's move to 100 percent
619 renewables was chiefly a business decision based on cost and price
620 stability.

621 Looking to energy efficiency, the private sector has, again,
622 been a leader. Almost 200 U.S. manufacturers have committed to
623 decreasing their energy intensity by 25 percent over 10 years as
624 part of the Department of Energy's Better Plants program.

625 These companies have already saved -- already reported \$3.1
626 billion in reduced energy costs. We also see meaningful moves
627 in the auto industry. Ford plans to nearly double its investment
628 in electric vehicles in the next five years and GM is working
629 towards an all-electric zero tailpipe emissions future with 20
630 new electric vehicle models to be available globally in the early
631 2020s.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

632 The NEF projects that by 2040, 55 percent of new global car
633 sales will be electric. Those states that have put a price on
634 carbon have also seen both environmental and economic benefits.

635 The Regional Greenhouse Gas Initiative, known as RGGI,
636 prices carbon dioxide emissions from the electric sector, serving
637 nine states from Maryland to Maine. RGGI states have
638 outperformed the rest of the country both environmentally and
639 economically.

640 During its first five years, emissions decreased 35 percent
641 in RGGI states but only 12 percent elsewhere. At the same time,
642 RGGI state economies grew faster than the rest of the country.

643 These are just a few of the good news stories about state,
644 local, and private sector movement towards renewables and other
645 forms of clean energy.

646 The degree of momentum behind this transformation and the
647 resulting economic benefits to local communities across the
648 country would be enhanced by federal support for development and
649 deployment of clean energy resources like renewables and energy
650 efficiency.

651 As other countries invest in clean energy, it's time for this
652 Congress and the administration to step up support for states,
653 cities, and businesses that are looking to seize the economic
654 opportunities presented by clean energy transformation.

655 Thank you for your time.

656 [The prepared statement of Mr. Kennedy follows:]

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

657

658

*****INSERT 5*****

659

Mr. Upton. Mr. Hamm, welcome.

660 STATEMENT OF HAROLD HAMM

661

662 Mr. Hamm. Thank you, Chairman Upton, Acting Ranking Member
663 McNerney, and other members of the committee.

664 My name is Harold Hamm. It's my honor to address you today
665 on the miracle of American oil and gas and its global impact.

666 As chairman of the Domestic Energy Producers Alliance and
667 CEO of the company that co-developed the first oil field ever
668 drilled exclusively with horizontal and a company that is the
669 largest leaseholder and most active driller and largest producer
670 both in the Bakken play in North Dakota and the SCOOP/STACK and
671 Springer plays of Oklahoma, I've been able to pioneer and
672 participate in the American energy renaissance first hand.

673 I testified to the House Agricultural Committee on July 8th,
674 2015, about the American energy renaissance and, particularly,
675 we was asking for lifting of the ban on exportation of crude oil,
676 and it was granted. We got it signed into law. President Obama
677 signed it into law and I appreciated that.

678 Of course, we have to remember back. It was on the omnibus
679 bill -- it's a little bit hard not to sign -- and a two-year
680 extension was given to wind and solar at that time and, of course,
681 two years times 10. It was a very costly addition -- the cost
682 renewals.

683 I said it then and I will say it again -- the American energy
684 renaissance is the single-most defining aspect on this planet

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

685 today that will shape the next 50 years ahead of us.

686 In the past 10 years, the United States has undergone
687 unprecedented transformation, as Daniel said, and thanks to the
688 ingenuity of America's independent oil and gas natural producers
689 -- oil and natural gas producers we are transitioning from a
690 consuming short supply nation to an energy long supplier
691 dominating the world oil market today.

692 Our country has rapidly gone from fears of energy scarcity
693 to understand that U.S. energy independence is well within our
694 reach. I think that will happen late 2020. We are a little ahead
695 of the IEA on that, and during this Trump administration we'll
696 become not only energy dominant but we'll become energy sufficient
697 and independent in the future.

698 And so we have had to rely on other countries to fuel our
699 energy needs drastically in the past, primarily from the Middle
700 East.

701 The instability of shifting alliances wreaked havoc on
702 American foreign policy for decades, and that's been complicated
703 by Russia and their involvement as well in the country's global
704 affairs.

705 But the American energy renaissance is rapidly shaping those
706 complicated dynamics to align with the U.S. to produce all the
707 energy that it needs.

708 Our energy imports have dropped from over 30 percent of
709 energy consumed in 2007 to less than 8 percent currently, and

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

710 because of these production gains, the U.S. no longer has to put
711 American lives in the Middle East particularly.

712 The ban on exports of crude oil was lifted in 2015 -- we talked
713 about that -- and we are now on pace to become a net energy exporter
714 and provide our allies with a reliable affordable supply of vital
715 commodities like oil, LNG, and other petroleum products, and we
716 can also impact the world with these clean fuels.

717 Rising U.S. oil production has have proven to be vital in
718 meeting global demand as production capacity -- while
719 eliminating dramatic price hikes have long been a hallmark of
720 global markets.

721 Total petroleum exports are now averaging close to 7 million
722 barrels a day, roughly, 2 million of which is crude oil.

723 The commitment of the Trump administration to repealing
724 unnecessary and in many cases archaic and onerous regulations is
725 the right move for America.

726 There are still a couple around the CAFÉ standards that was
727 approved back when everybody thought we was running out of oil.
728 Certainly, it is wreaking havoc with the -- on the highways today
729 and claim an additional 10,000 lives per year due to the small
730 size imposed by CAFÉ standards on vehicles.

731 Also, the archaic SCC rules need to be changed that limit
732 our production and booking just to five years. If we are to be
733 energy dominant, we certainly need to recognize that.

734 And we've done it environmentally sound, no governmental

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

735 assistance or subsidies. It's all come from the independent
736 sector.

737 Thank you.

738 [The prepared statement of Mr. Hamm follows:]

739

740 *****INSERT 6*****

741 Mr. Upton. Thank you all, and I -- you know, I remember
742 coming to Washington as a young staff -- I am still young -- and
743 I remember the gas lines.

744 I remember having a 1 at the end of my license plate which
745 allowed me to fill up, after an hour and a half, at a Shell station
746 around the corner here on Capitol Hill.

747 And, Mr. Arriola, I don't know how you did it but you got
748 one of the sharpest people in your organization in the woman behind
749 you, Maryam Brown.

750 She was one that worked hard with our Energy and Commerce
751 staff to actually develop the strategy that, I got to tell you,
752 was bipartisan -- the North American Energy Independent Plan --
753 and laid it out.

754 We had testimony from Dr. Yergin back then, who predicted
755 that we could do this if you unshackle the industry, and I got
756 to tell you, nine years ago, the day that President Obama was sworn
757 in the gas price -- average gas price, and that was before Memorial
758 Day and before July 4th, was \$3.84 a gallon, and it hurt a lot
759 of people, particularly the most vulnerable.

760 And as I recall, that summer gas prices got pretty close to
761 \$5.00 and even over -- in some areas like California even maybe
762 \$6.00 a gallon.

763 This last weekend, I was home in Michigan. I watched gas
764 prices at \$2.65. So forget inflation. I mean, it is so -- we
765 are so much better off, and the strategy that we laid out, which,

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

766 again, was bipartisan.

767 Mr. Hamm talked about it. President Obama signed it into
768 law to lift the crude oil and there were still some, even from
769 Texas, who voted against the omnibus, even though that was part
770 of it, despite Mr. Barton's pleading, and he did a great job in
771 lining up the support to get that done.

772 But where would we be today without this? And I guess the
773 other quick question that I have for Mr. Yergin, you said in your
774 testimony that we anticipate that U.S. production could grow by
775 another 60 percent over the next 20 years.

776 You know, I talk to my farmers who use natural gas to dry
777 their corn. You know, most of my constituents -- many of them,
778 anyway -- have natural gas for heating and cooling and so those
779 rates have gone down. They're not even a third of what they were
780 10, 15 years ago.

781 Where are we headed with this continued new production that
782 in fact not only can we export and so help our balance of trade,
783 but what is that going to do for the average family across the
784 country?

785 Mr. Yergin. What it's meant is lower cost for electricity,
786 lower cost for heating, and it's also, because of the impact on
787 this economy, I mentioned in my written testimony we've added
788 about \$120 billion of new investment directly in manufacturing,
789 about maybe a same amount as ancillary.

790 So it's created a lot of jobs. It's really been beneficial

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

791 across the board.

792 Mr. Upton. And it's done a lot for the climate as well. I
793 mean, we know that emissions -- CO2 emissions -- have dropped by
794 30 percent. I think half of that is just by the transformation
795 to coal -- from coal, I should say.

796 Mr. Yergin. Well, I mean -- yes, if you look at it, our
797 emissions today are back to the level of the early 1990s although
798 our economy has almost doubled since that time and gas has been
799 an important part of that.

800 Mr. Upton. Mr. Hamm, you indicated in your testimony that
801 U.S. has the lowest gas and diesel prices in the developed world.
802 What are the biggest drivers of reducing those prices and what
803 can we do to continue to keep those prices low?

804 Mr. Hamm. A lot of it has to do with the product that's
805 produced. Just like the Bakken -- you know, that's -- that oil
806 has no bottoms to speak of, no asphalt.

807 Basically, a lot of middle distillates, which is gasoline,
808 diesel, kerosene, and when that -- you know, prior to it coming
809 into existence back in 2007, you saw diesel prices at \$4.00, \$4.50
810 a gallon, and that was because there wasn't much you could wring
811 out of a barrel of bitumen coming in from Canada.

812 But with the addition of all this oil coming in in the Bakken,
813 that price went to \$2.25 and it did it very quickly. And so as
814 a result, we see both diesel and gasoline prices the cheapest that
815 you have seen.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

816 And so we have the lowest gasoline prices in the world that
817 we are enjoying and this is with some state taxes on it, and some
818 of them, like, California, get pretty high.

819 Mr. Upton. So in my remaining 15 seconds, if the oil price
820 stays about the same -- where it is today -- is that going to
821 continue to see the exploration and the drilling and the
822 production of domestic resources versus going too low and maybe
823 shutting those off?

824 Mr. Hamm. You know, we have a great supply. You know, I
825 think we are all -- I am a geologist -- looking forward with natural
826 gas.

827 I think we've got a 100-year supply or more. You know, I
828 think we can produce 10 million barrels a day of crude oil for
829 the next 85 years. You know, again this is an entirely new
830 reservoir to explore.

831 Basically, what we've done in the past is explored what
832 leaked off of these giant shale fields where the oil was generated.
833 And so all we could do is maybe that 15 percent that leaked off
834 into upper reservoir traps we could go after that.

835 Today, we can go into those resource beds like the Woodford
836 and the Bakken and produce the oil left in them. So there's about
837 85 percent available. What can we get of that -- 20, 25, 30
838 percent? Sure.

839 Mr. Upton. My time has expired. Mr. McNerney.

840 Mr. McNerney. Thank you, Mr. Chairman. Your time has more

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

841 than expired.

842 Excellent presentations. I really appreciate all of your
843 words. Dr. Yergin, the financial disclosure of climate effects
844 for oil companies -- is that possible to make that happen? What
845 would it -- how would it affect the economy?

846 How would it affect the companies and how can we get that
847 information to shareholders if they're not going to be able to
848 produce that information?

849 Mr. Yergin. I think a lot of that is being produced now.
850 Companies are preparing their financial disclosure reports, their
851 sustainability reports.

852 The question is does it go in the financial reports, does
853 it go in others, and I think there's a process going on with the
854 climate-related financial disclosures to get the right framework
855 for meaningful information that's meaningful for investors. So
856 I think we have pointed to something that's in process and being
857 developed.

858 Mr. McNerney. Thank you. Do you -- in my opening
859 statement, I mentioned the cyclical nature of the oil business
860 economically. Do you see that happening now or do you think
861 because of the shale revolution that it's going to flatten out
862 a little bit?

863 Mr. Yergin. No, I think -- I think you hit it on the nail.
864 It's a cyclical business. It's always been a cyclical business
865 and if you look at the oil market today you see that we've gone

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

866 from that really big surplus that led to the collapse with a
867 tightening market and you have some very important geopolitical
868 things that are happening.

869 One is the rapid decline and collapse in Venezuela in oil
870 production, which is something that we can feel the impact of in
871 the next several months.

872 Just to give you the numbers, Venezuela was 22 million barrels
873 three years ago. Today, it's 1.4. We think next year it'll be
874 at 800,000 and could be lower than that.

875 And the other thing that's, obviously, with the sanctions
876 coming on Iran, it's -- with a very different pacing by this
877 administration and the Obama administration, right now there's
878 uncertainty about that.

879 So I think, you know, whenever they say cycles have been
880 abolished I tend to think no.

881 Mr. McNerney. Thank you. You know, I believe one of the
882 big drivers to the shale revolution was the way that ownership
883 of the minerals below the surface as handled in this country as
884 compared to other countries.

885 Are other countries going to be able to carry on this -- pick
886 up the shale revolution or is that going to be continuing to be
887 driven in this country?

888 Mr. Yergin. Well, it's in Canada, but the kind of early
889 thoughts that it was going to spread rapidly around the world has
890 not borne out, partly for geological reasons, partly for political

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

891 reasons, and partly for the reason you point to -- that the
892 resources under the grounds are owned by governments, not by the
893 farmers who work on them.

894 I would say the area now that there's the greatest optimism
895 about is what's called the Vaca Muerta, which means dead cow, which
896 is an area of Argentina and that's where the focus is.

897 But so far, this is really a North American deal.

898 Mr. McNerney. How about geopolitical leverage of our oil
899 export and natural gas export versus what's happening as a result
900 of us pulling out of Paris and sort of repercussions of us pulling
901 back with regard to being a leader on climate change?

902 Mr. Yergin. I think there are kind of two separate things.
903 Obviously, Dr. Kennedy has described the latter.

904 But I am very struck when I go to a country like India to
905 see that, to them, it's very significant that there's this whole
906 new dimension to their relationship with the United States that
907 we are exporting gas to them.

908 We are actually exporting oil to them and it gives a whole
909 new strand to that relationship and a kind of dialogue that wasn't
910 there before, and I see that in many countries around the world.

911 And I think that the -- you know, I don't know where we are
912 on trade right now but, certainly, LNG exports to China were seen
913 as one factor that changed the trade balance between our two
914 countries.

915 Mr. McNerney. Thank you. Dr. Kennedy, could you give me

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

916 some indication of the job creation per kilowatt hour equivalent
917 of renewables versus oil and natural gas?

918 Mr. Kennedy. I don't have those numbers off the top of my
919 head. But I would be happy to sort of go back to the office and
920 gather some of that information and provide it to you, yes.

921 Mr. McNerney. Okay.

922 Mr. Arriola, I am concerned about Sempra's design of selling
923 off its renewables. Can you give me some clue where Sempra is
924 with regard to that process?

925 Mr. Arriola. I think what you're probably referring to,
926 Congressman, is a shareholder proposal that we received in the
927 last couple weeks from an investor group, and what I can tell is
928 Sempra is totally dedicated and committed to continuing our focus
929 with renewables.

930 In fact, if you look at -- and you know our company, San Diego
931 Gas and Electric, it's actually one of the leading companies that
932 procures renewable power on behalf of our customers.

933 In fact, last year over 45 percent of the power that we
934 procured was renewables and we are continuing to focus on what
935 we can do from the battery storage technology standpoint in
936 looking at electric vehicles.

937 So Sempra, at its core, is focused on sustainability and part
938 of that is renewable energy as well.

939 Mr. McNerney. Okay. Thank you. Yield back.

940 Mr. Olson. [Presiding.] The chair now calls upon the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

941 gentleman from Texas, the vice chairman of the full committee,
942 Mr. Barton, for five minutes.

943 Mr. Barton. I thank the gentleman from Fort Bend County,
944 Texas, and I can't tell you how excited I am to have this hearing.
945 It's really exciting for me.

946 I've got all kinds of questions but I am going to -- since
947 I only have five minutes I am going to try to be as quick as
948 possible.

949 Mr. Yergin -- and this would be also for Mr. Hamm -- what's
950 -- with current technology and current resource base, what's the
951 upper limit for oil production per day in the United States as
952 compared to Saudi Arabia and Russia?

953 Mr. Yergin. Well, as a famous wildcatter in Texas said about
954 around 1900, on Dr. Drill knows for sure. But I think now an
955 informed view, and I think we see it from even the Energy
956 Information Administration and others, the U.S. today is a little
957 short of 11 million barrels a day.

958 It could be 14 or 15 million barrels a day. Russia is around
959 11 million. Saudi is, like, 10.3. So we are moving into this
960 position very significant and, you know, you take the Permian in
961 Texas, which Mr. Hamm referred to.

962 Eight years ago, it was 900,000 barrels a day. It's 2.5.
963 We think another five years the Permian alone will be 5.4 million
964 barrels a day, which will make it larger than any country in OPEC
965 except for Saudi Arabia.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

966 Mr. Barton. Mr. Hamm.

967 Mr. Hamm. I don't have any change to that. Daniel is right
968 on. You know, this year, best guess that we are going to grow
969 about 900,000 barrels per day in the U.S.

970 So, you know, there's some infrastructure things out there
971 that, you know, will cap some of that -- that growth. But, you
972 know, I don't see that number changing for a while.

973 Mr. Barton. Is there any other country in the world that
974 has a higher delta potential production increase than the United
975 States?

976 Mr. Yergin. Well, I will say that --

977 Mr. Barton. I hope the answer is no.

978 Mr. Yergin. The answer is no. I don't think anywhere in
979 the world has actually seen the kind of growth that we've seen
980 in the United States in the last five or six years. It just
981 doesn't happen anywhere else in the world. It's breathtaking.

982 Mr. Barton. What is China's potential oil and gas
983 production as a percent of its demand? Do they have the ability
984 to produce what they consume in oil and gas or will they -- will
985 they be a net importer of --

986 Mr. Yergin. No, they're going in just the opposite
987 direction we are. They are now importing 75 percent of their oil
988 and I think IEA has just said next year they're going to be the
989 largest importer of natural gas, which has become a real
990 imperative for them.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

991 So they're becoming more deponent and, you know, it's
992 striking to see that part of their portfolio now is from the United
993 States.

994 Mr. Barton. This next question is for Mr. Arriola, since
995 you're with Semptra. What's the 10-year outlook for LNG prices
996 on the world market? I would assume they're going to come down
997 as we ramp up our exports?

998 Mr. Arriola. No, I think -- Congressman, I think you're
999 correct. I think what we are finding is that as demand externally
1000 continues to increase, there's more production going on here
1001 domestically and it's helping to actually keep prices relatively
1002 flat or actually continuing to push them down, and as we see
1003 additional advances in technology I think it's really good for
1004 consumers long term.

1005 So what we are seeing in why countries on the outside are
1006 looking to buy U.S. natural gas is because of the stability of
1007 those prices.

1008 Mr. Barton. My assumption -- of course, I am not in the
1009 market like you are, but my assumption is that as we ramp up our
1010 export terminal capability and capacity that those prices are
1011 going to come down, but they're going to level out, I hope, about
1012 halfway from where they were a couple years ago and where our
1013 domestic price is.

1014 So if we can get it \$7, \$8 in MCF equivalent, I think -- I
1015 hope it's somewhere in that range. Can U.S. exports be profitable

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1016 in that price range?

1017 Mr. Arriola. What we are seeing from the market is that the
1018 demand is there, and Mr. Hamm knows probably better than anyone
1019 that the U.S. production market is continuing to look for more
1020 natural gas and oil, which they wouldn't be doing it if it weren't
1021 profitable.

1022 Mr. Barton. This is my last question and I am going to sort
1023 of pat myself on the back here. You know, I helped lead the fight,
1024 and a lot of members on the committee did, to repeal the ban on
1025 crude oil exports three or four years ago, and this committee also
1026 led the effort to make it possible to permit LNG terminals in a
1027 more timely fashion.

1028 What's the geopolitical significance of those two
1029 congressional actions?

1030 Mr. Yergin. I think the geopolitical position is
1031 strengthening the United States and strengthening our position
1032 in the world.

1033 I mean, it really gives us a whole new vocabulary to talk
1034 to countries about and the degree and a whole new category of kind
1035 of respect and a deeper relationship. So it's been proved to be,
1036 I think, very positive.

1037 Mr. Arriola. Congressman, what I would say to that is we
1038 talk to customers outside of the United States. They're looking
1039 for options. They're looking for options away from Russia and
1040 other countries and they want the United States to be one of those

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1041 options.

1042 Mr. Yergin. If I could say one other thing -- it also --
1043 there's a lot of contention in the relationship with China right
1044 now.

1045 But this has taken one issue of contention off the table,
1046 because if you go back eight, 10 years, there would still have
1047 to be this zero sum game between China and the United States for
1048 energy. That's completely gone, and I think that's something
1049 that improves our position.

1050 Mr. Barton. Thank you, Mr. Chairman.

1051 Mr. Olson. Pat on the back complete. The chair now calls
1052 upon Mr. Peters from California for five minutes.

1053 Mr. Peters. Thank you, Mr. Chairman. I thank the witnesses
1054 for being here. I will say hello to Mr. Arriola from San Diego,
1055 and congratulations on the SDG&E being at 45 percent.

1056 I say it's the highest, the most renewable. If you know of
1057 a utility that's doing better you should -- unless you know that,
1058 you should say it's the highest, not one of the highest.

1059 Mr. Arriola. We'll do that in the future. Thank you.

1060 Mr. Peters. Okay. Thanks. Not that you're running for
1061 office.

1062 You referred to clean natural gas in your testimony. I think
1063 that implicit in that is the statement that natural gas burns
1064 cleaner than coal and I think most people would concede that.

1065 The thing that a lot of folks say, though, is that a lot of

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1066 the benefit of natural gas is lost because of fugitive methane
1067 emissions -- that methane being a much more damaging agent to
1068 climate even than carbon dioxide in the short run.

1069 The flip side of that is if you could contain it -- if you
1070 could -- if you could keep methane from escaping you could have
1071 a good impact on the rate of climate change.

1072 Let me ask you kind of how do you think the United States
1073 is doing in terms of methane capture? And I would like you to
1074 address that -- I am going to ask the same questions of Mr. Kennedy.

1075 Mr. Arriola. You know, it's a great question, Congressman,
1076 because I think with all of the advancements in technology and
1077 all of the capital expenditures that we've had within our
1078 industries over the -- I would say over the last 10 years, we have
1079 been able to identify and remediate substantially a lot of the
1080 methane emissions that come from the natural gas supply chain.

1081 And so when you compare the United States -- and this is based
1082 upon numbers that were coming out of the EPA, the United States
1083 is probably one of the lowest when you look at the overall supply
1084 chain -- probably close to 12 percent is the number that I've seen.

1085 What I would tell you is that there are additional
1086 opportunities for us to be able to capture methane emissions that
1087 don't necessarily come from the natural gas supply chain but,
1088 rather, from the agricultural industry, the water supply
1089 industry, landfills, and within our company we are actually
1090 looking at new technologies to try to gather this and really create

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1091 renewable natural gas by using it for either transportation fuels
1092 and/or reinjecting it into our pipelines.

1093 So I think there's more opportunities there and we are
1094 focused on those.

1095 Mr. Peters. Just in terms of natural gas collection and
1096 distribution, it's my concern that the market may not provide
1097 sufficient incentives to look after that.

1098 Mr. Kennedy, what do you -- what would you tell me about
1099 methane capture?

1100 Mr. Kennedy. Thank you, Congressman. I would agree that
1101 both -- that there are many of the technologies that are available
1102 and can be used to help contain and capture the methane leakage
1103 from the oil and gas industry but they are often not being used
1104 to the degree that they should be.

1105 In a recent report just last week, some academic studies
1106 looking at the degree of methane leakage across the oil and gas
1107 industry are suggesting that it is much greater than EPA had been
1108 estimating.

1109 I have not had a chance to look in any depth at that study
1110 but am greatly concerned that that is an indication that while
1111 CO2 emissions are down because of the advantages on the combustion
1112 side between natural gas and coal that the methane leakage may
1113 in fact be using up much of that advantage or even all of that
1114 advantage.

1115 I would also agree that there's opportunities for renewable

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1116 natural gas from other sources. We have done some recent work
1117 on that. So there's other opportunities to capture other
1118 methane.

1119 But the oil and gas industry has the ability, but needs a
1120 lot of attention to make sure that they really capture methane
1121 as they could.

1122 Mr. Peters. I would just say I would like to follow up with
1123 both of you or all of you about what we could do on that. I was
1124 invited to attend a conference held by Harvard Business School
1125 on America's unconventional energy opportunity, they called it.

1126 It was in -- it was in March of 2015 -- where they assessed
1127 that the cost of actually controlling this was very small in
1128 relation to the revenues and the profits.

1129 But I don't -- it just strikes me that we should come up with
1130 some regulatory regime because this is classic market failure,
1131 I believe, when the cost of capturing that few -- that little bit
1132 of methane gas may not be sufficient to induce someone to keep
1133 it from escaping and I think -- I think, frankly, Sempra's been
1134 pretty open to that and I look forward to working with you.

1135 Mr. Chairman, I yield back.

1136 Mr. Olson. Thank you. The chair now calls upon Mr. Shimkus
1137 from Illinois for five minutes, sir.

1138 Mr. Shimkus. Thank you, Mr. Chairman, and my colleague's
1139 line of questioning -- from California.

1140 I do want to make a point on the renewable natural gas that

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1141 in the RFS in the advanced bucket there are credits for renewable
1142 natural gas.

1143 That's actually a growing part of the advanced bucket of the
1144 RFS. So we should visit on that as we go down this route.

1145 A question I have -- I am going to focus on the refined
1146 products and exports for a minute and I would like to ask Dr. Yergin
1147 and Mr. Hamm what countries outside of North America do we ship
1148 refined products too?

1149 Mr. Yergin. Well, I don't have all of them in my head by
1150 any means. I know Latin America is a big source, sometimes
1151 Europe, perhaps even Asia.

1152 I think in terms of LNG exports, I think so far we've exported
1153 LNG to about 26 different countries.

1154 Mr. Shimkus. Mr. Hamm.

1155 Mr. Hamm. Yes. You know, the refineries in this country,
1156 30 percent of it is owned by foreign governments and entities and
1157 they can ship wherever they want.

1158 They, basically, own those refineries. Much of it was built
1159 for their own oil, like the Canadians, Venezuelans, PEMEX. And
1160 so that oil, basically, is coming through, refined here and where
1161 it goes is any customer that they have around the world.

1162 And so about 5 million barrels a day is refined products that
1163 go to those customers wherever.

1164 Mr. Shimkus. Can anyone talk to me the difference between
1165 the, in essence, the refined product on the gasoline side for

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1166 octane ratings the difference between the United States and the
1167 European market, and is there one? Does anyone know that?

1168 We've been working on it. Bill Flores and I are -- we are
1169 focusing on trying to revise the renewable fuel standard. As many
1170 of you people know, there is a push on looking at octane, and then
1171 the basic argument is this -- why not get our smartest petroleum
1172 engineers and our smartest engine engineers to work together to
1173 figure out what's the best product. It addresses maybe a CAFE
1174 issue. It might address a little carbon issue.

1175 So in our research we found out that in the United States
1176 our regular is 91 to 92 real octane number. The European gasoline
1177 is at a 95 real octane number.

1178 So the question would be do you see any benefits of a kind
1179 of a unified octane standard in just markets as far as exporting
1180 refined product to the European market if we had the same octane
1181 standard as they would have?

1182 My guess is that would be beneficial, just through simplicity
1183 of markets and commodity product. Is that farfetched?

1184 Dr. Yergin.

1185 Mr. Yergin. This is new to me. I feel I need to go back
1186 and ask my refinery -- my colleagues who work in refining that
1187 question and focus on it. I would be happy to --

1188 Mr. Shimkus. Yes, I think -- well, we are putting a lot of
1189 time to it and I would appreciate any smart people looking at this.

1190 We are trying to address this -- obviously, the White House

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1191 is and the secretary of ag and the secretary of energy and the
1192 EPA administrator.

1193 The industry is being whipsawed back and forth with different
1194 proposals and I think that's what happened when you don't have
1195 a legislative fix and a legislative schedule and agenda. So we
1196 have a lot of different stakeholders.

1197 The last thing for -- part of this is, and I direct this to
1198 you, Mr. Hamm, because we do talk about CAFE standards, and without
1199 a change in the fuel mix, as we are predicting, the way to reach
1200 CAFE standards is to have smaller lighter vehicles, which might
1201 address, one, safety issues for some, and then in rural America,
1202 a total rejection of -- because we like big trucks, big engines,
1203 big power aspects.

1204 Do you -- if -- in this issue of -- do you see a -- do you
1205 see a benefit in the aspect of CAFE if you have high-compression
1206 engines that can go further on the same amount of gas, as far as
1207 meeting CAFE standards?

1208 Mr. Hamm. You can only go so far with that technology and
1209 manufacturers have done what they could with high-compression
1210 engines and fuel injection and everything that goes along with
1211 that, and what it came down to was the shadow of a car gets smaller
1212 and smaller and smaller, and it's rejected by the buyers in
1213 America.

1214 So pretty soon everybody's buying SUVs. Everybody is buying
1215 pickup trucks or they're buying these little cars if that's all

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1216 they can afford and putting their families in it.

1217 But what we've seen is that we've reduced -- we've reduced
1218 with seatbelts and airbags and everything else safety fatalities
1219 from 45,000 down to about 30,000, and that was the bottom, and
1220 now it's crept up due to the small size of these cars back up to
1221 40,000.

1222 So it's killing 10,000 Americans per year, and we have --
1223 that's the number of them because you have got a huge mix of bigger
1224 vehicles out there with these little cars. And they're made out
1225 of aluminum -- they crush up like a beer can, kill everybody
1226 inside.

1227 Mr. Shimkus. Yield back. Thank you, Mr. Chairman.

1228 Mr. Upton. [Presiding.] Mr. Tonko.

1229 Mr. Tonko. Thank you, Mr. Chair. Earlier this month, Pope
1230 Francis met with some of the world's largest oil and gas companies
1231 to urge them to take the threat of climate change more seriously.

1232 But the consequences of climate change are not just moral
1233 or environmental-based. Any of the world's largest investors say
1234 it is an economic concern as well.

1235 Mark Carney, the governor of the Bank of England and chair
1236 of the G-20's Financial Stability Board, has made it clear that
1237 businesses should be assessing and disclosing climate related
1238 risks.

1239 A 2016 Black Rock Investment Institute report concluded that
1240 all investors should incorporate climate change awareness into

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1241 their investment process and that advice is being heeded.

1242 Investors representing trillions in assets have urge this
1243 sector to be more transparent and take responsibility for its
1244 emissions.

1245 Dr. Kennedy, I listened as there was some discussion about
1246 shareholders in this whole arena, and shareholders have helped
1247 drive greater disclosures of companies' climate-related risks.

1248 How important is it for shareholders to be given this
1249 information when making decisions on how to invest their money?

1250 Mr. Kennedy. This is a topic that I've not gone into in
1251 depth. But what I would say is that our economic system, our
1252 investment system, which is often driven by short-term returns,
1253 has a great difficulty in dealing with longer-term challenges and
1254 longer-term economic risks like climate change.

1255 And so the more information that can be made available to
1256 investors about the implications of the investments and what those
1257 mean in the long term is going to be very important and very
1258 helpful.

1259 Mr. Tonko. Thank you. And is there a risks to the United
1260 States economy if companies fail to make these disclosures?

1261 Mr. Kennedy. The risks of climate change itself are
1262 actually very great for the U.S. as we are already seeing
1263 significant impacts.

1264 From the changing climate, from increased severe weather,
1265 from increased sea level rise, storm surge, a wide variety of

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1266 impacts are already starting to show up and we can only expect
1267 those to continue to increase over time, particulate if we don't
1268 find ways of reducing emissions.

1269 So the more that can be done from a variety of perspectives
1270 including in terms of how investment decisions are made is going
1271 to be critically important to address those real risks, going
1272 forward.

1273 Mr. Tonko. Thank you. According to Sempra's 2015 corporate
1274 responsibility report, Sempra began responding to the annual
1275 carbon disclosure project -- CDP survey -- in 2006, which reports
1276 the emissions of major companies and releases and assessment of
1277 their potential climate risks.

1278 Since 2015, Sempra has scored 100 out of 100 on disclosure.
1279 Mr. Arriola, why has Sempra made this a priority and do you believe
1280 that such disclosures are important across the energy sector?

1281 Mr. Arriola. Congressman, it's important to us because it's
1282 important to our consumers in the communities where we do business
1283 as well as to our shareholders.

1284 As you have mentioned, there's been a trend I would say over
1285 the last decade that really started in Europe but now has come
1286 more forcefully to the United States where investors -- and I am
1287 talking about large institutional investors -- really do want to
1288 understand what companies are doing to address climate change,
1289 but not just climate change -- how they're dealing with water,
1290 how they're dealing with diversity in companies -- really, both

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1291 sustainability and corporate responsibility.

1292 And we -- this is something that we take very seriously in
1293 our company and actually on Friday we'll be releasing our most
1294 recent sustainability report, which I think continues to get
1295 better and better and it gets acknowledged by different
1296 organizations because we go beyond what we need to because we think
1297 it's important for investors to understand what we are doing on
1298 their behalf.

1299 Mr. Tonko. Thank you. And Mr. Hamm, Continental Resources
1300 is one of the largest non-responders to CDP's annual disclosure
1301 request. Any reason why you do not participate?

1302 Mr. Hamm. Excuse me. There's not any specific reason.
1303 You know, climate change -- I am a geologist. I believe that we
1304 can affect the climate and I certainly think that investors can
1305 pick or choose which company that they would want to invest in
1306 and who are the best stewards of the land and water, air.

1307 Continental certainly fits in at the top of that rank. With
1308 horizontal drilling, there's a lot of drilling that goes on but
1309 it certainly doesn't look like it.

1310 You know, the methane emissions that you talk about, our
1311 company has been doing green completions as long as I remember.
1312 So --

1313 Mr. Tonko. But that being said, why not then respond to
1314 CDP's annual request?

1315 Mr. Hamm. You know, I don't believe we've had the specific

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1316 annual request in that regard that I recall.

1317 Mr. Tonko. Okay. I yield back, Mr. Chair.

1318 Mr. Upton. Thank you. The chair would recognize Mr. Latta.

1319 Mr. Latta. Thanks, Mr. Chairman, and thank you very much
1320 for holding today's hearing and thank you very much for our
1321 panellists for being with us today.

1322 It's very, very important as we go forward with energy
1323 development in this country.

1324 Mr. Yergin, if I can start my questions with you. You know,
1325 we on this committee have a great opportunity to speak with
1326 political leaders and business leaders across the world, and it's
1327 very interesting through the last several years I've had -- the
1328 discussions I've had with those individuals they've all asked this
1329 one question -- how is it the United States has been able to do
1330 what you have done and be able to accomplish it so quickly.

1331 And then the next question would be is do we have any
1332 competitors or other countries that are out there that are trying
1333 to do the exact same, maybe to duplicate, you know, what we've
1334 done in this country and are they able to do that as we did in
1335 this country.

1336 Mr. Yergin. Do you mean in terms of the unconventional
1337 revolution or in general?

1338 Mr. Latta. Correct.

1339 Mr. Yergin. I think aside from what we've seen in Canada,
1340 which is kind of like an offshoot of here, no, nobody else, and

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1341 it's a combination of the resource base, the ecosystem, our legal
1342 system, our entrepreneurial system and the fact that we have all
1343 these supply chains to respond to it.

1344 So that's why, you know, it is something you look at and you
1345 say things don't happen normally this fast and this has really
1346 happened fast.

1347 Mr. Latta. Well, I know someone had asked a little bit
1348 earlier a question to you and you responded back about what's
1349 happening with Iran and in Venezuela.

1350 Where do you see the United States -- I know this has come
1351 up in some of the other questions -- but when you're looking around
1352 the world -- our place in the world, because it's hard to explain
1353 to people that don't remember the mid-1970s and understand what
1354 happened in this country, and trying to explain to people that,
1355 you know, in some areas of the country either, A, you didn't buy
1356 gas on certain days because your license plate didn't end with
1357 a even or odd number, or, you know, people were just told we didn't
1358 any energy in this country.

1359 But where do you -- you know, where do you see this country
1360 and what that means for us geopolitically then?

1361 Mr. Yergin. I think it's -- I mean, at that time the view
1362 was that, you know, we were just going to be held hostage -- that
1363 we'd lost control of our lives on a daily basis in terms of gas
1364 lines and in terms of our economy, and this has been such a
1365 turnaround.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1366 Ben Bernanke, when he stepped -- was at our conference just
1367 after he stepped down as head of the Federal Reserve, said this
1368 unconventional revolution was one of the most positive, if not
1369 the most positive thing, to have happened since the 2008 crisis.

1370 Clearly, people who don't remember, you know, it's -- you
1371 know, they see grainy images maybe on television of gas lines and
1372 said, what is that all about.

1373 So that's why it's such a big turnaround, and I think it took
1374 a few years psychologically for people to -- you know, for many
1375 people to realize that this is for real.

1376 Mr. Latta. Thank you. Mr. Hamm and Mr. Arriola, what
1377 growth have your companies seen in job creation and career
1378 opportunities as a result of the shale revolution?

1379 Mr. Arriola. Sure. Starting at Sempra Energy, if you would
1380 have looked at our company just over 10 years ago, our LNG business
1381 really didn't exist.

1382 So we've hired, I would say, hundreds of people to help
1383 develop our LNG projects in Mexico and Louisiana, and we are
1384 looking forward to hiring even more in Texas.

1385 I think that's probably the biggest part. I can't give you
1386 an exact number but it's in the hundreds, of well-paying jobs.

1387 Mr. Latta. Mr. Hamm.

1388 Mr. Hamm. Well, you know, our company, like a lot of
1389 independents, you know, we've had good growth over this period
1390 of time and the industry in total has added over a million jobs

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1391 -- you know, basically, every sector from the service sectors
1392 through B and P production and exploration, and so it's been a
1393 tremendous driver of the American economy.

1394 Mr. Latta. Well, I think what was just brought up is also
1395 important because I think that sometimes when we talk about a
1396 company and how many jobs are being created it's not all the folks
1397 out there who are, you know, in -- on the steel end and those who
1398 produce the pipe, and you name all the different things that have
1399 to be done to get there, and so all of the other jobs that are
1400 the offshoots. So it's been a great boon for the economy.

1401 Mr. Arriola. Congressman, if I could also just interject
1402 that --

1403 Mr. Latta. Yes, absolutely.

1404 Mr. Arriola. -- the jobs I was talking about were directly
1405 at Sempra.

1406 Mr. Latta. Right.

1407 Mr. Arriola. If you look at the projects that we've had --
1408 for example, our Cameron LNG facility -- there are over 10,000
1409 people on the job today. Once we develop our Port Arthur
1410 facility, there will be over 3,000 jobs going for four to five
1411 years.

1412 So it's not necessarily just the jobs directly at our company
1413 that are important from an economic perspective but it's all of
1414 the jobs that get created by these projects.

1415 Mr. Yergin. We calculated a couple of years ago that it was

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1416 well over 2 million jobs because the supply chain in the Middle
1417 West that was a very big beneficiary because of the supply chains,
1418 because of the manufacturing capabilities that fed into this.

1419 Mr. Latta. Thank you very much, Mr. Chairman. My time has
1420 expired.

1421 Mr. Upton. The gentleman from Texas, Mr. Green.

1422 Mr. Green. Thank you, Mr. Chairman and the ranking member,
1423 for holding this important hearing, and I am glad to know that
1424 the World Gas Conference is here in Washington.

1425 Dr. Yergin, I remember a few years ago we had one of our
1426 conferences in Houston and you interviewed our EPA administrator,
1427 Gina McCarthy, and I think that was the first time she went to
1428 an energy conference, and I appreciate the hospitality and also
1429 representing an area that deals with environmental issues every
1430 day because that's our job base, our refineries, our chemical
1431 plants in east Houston and Harris County.

1432 So Texas is the largest generator of wind power in the country
1433 right now and, hopefully, we can do other things. But what we've
1434 seen, though is that the mix of the electricity -- and we do need
1435 electricity plants to produce those for those electric cars --
1436 and, you know, our choices are in Texas we have 20 percent nuclear
1437 power.

1438 That's the base power. You know, wind energy -- coal has
1439 actually gotten down lower because the price of natural gas is
1440 so cheap and that's why it's -- I think that mix works and we'll

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1441 continue to see renewables pick up some.

1442 But it's easier to turn on a burner on a natural gas plant
1443 than it is to try and keep a coal storage facility.

1444 The -- our American energy renaissance -- because I've been
1445 in Congress since 1993 and it's been amazing what's happened. Mr.
1446 Arriola, in your testimony you talk about how the U.S. regulatory
1447 certainty at FERC could hinder U.S. LNG development in comparison
1448 to countries like Russia, Australia, Qatar, or Mozambique. What
1449 changes would you like to see in the regulatory process?

1450 Mr. Arriola. Thank you, Congressman. You know, I think we
1451 believe that it's important to have a very thorough and exhaustive
1452 review process on any permitting, especially from FERC and the
1453 DOE.

1454 What we'd encourage is just making sure that it's as
1455 streamlined as possible -- that it's efficient but that we check
1456 the box as quickly as we can -- that we don't recreate the wheel
1457 on every project, and I will give you an example.

1458 When we went through the process for our facility in Cameron,
1459 Louisiana, it took FERC 553 days to get through the entire project.

1460 As we are seeking approval here for our Port Arthur LNG
1461 facility in Texas, it's essentially the same engineering design
1462 that we are trying to duplicate in Texas. Right now, we are
1463 estimating that it's probably going to take closer to a thousand
1464 days.

1465 Now, granted, there are more projects that FERC is looking

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1466 at and we've been working very constructively with their staff
1467 and everything.

1468 But I think part of it is just making sure that they have
1469 not just more resources but the right resources and that the
1470 agencies like FERC and DOE work together to eliminate the
1471 bottlenecks to the extent that they can.

1472 Mr. Green. Right now I've been told -- and if you could
1473 confirm it -- the Trump administration's approval time line for
1474 LNG export permitting trails that of the Obama administration.
1475 Is that correct?

1476 Mr. Arriola. That's our understanding.

1477 Mr. Green. I think that would shock a lot of us.

1478 Mr. Arriola. Yes.

1479 Mr. Green. And I want to make sure that FERC has the staff
1480 it needs to move efficiently through the permitting process.

1481 I've also -- in fact, this committee passed legislation on
1482 cross-border pipelines to sell natural gas from Texas or New
1483 Mexico to Mexico, and Mexico has -- literally, can only refine
1484 about 60 percent of their petroleum they need for diesel and gas
1485 and 40 percent of that comes from typically the refineries along
1486 the Gulf Coast.

1487 The Eagle Ford Basin doesn't stop at the Rio Grande River
1488 either and there'll come a time in the future that Houston's
1489 petrochemical industry may need the gas from Mexico and those
1490 pipelines could benefit us in our industry and east end.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1491 Mr. Mullin and I addressed this with the cross-border
1492 pipeline that passed the House last summer, and I am pleased that
1493 Senator Hoeven introduced companion language in the Senate last
1494 week to move it quickly to conference.

1495 Mr. Arriola, could you speak how our energy relationship with
1496 Mexico has shifted recently? What benefits does the U.S. stand
1497 to gain from an integrated North American energy market between
1498 Canada, Mexico, and the United States?

1499 Mr. Arriola. Sure, Congressman. I think it's -- you know,
1500 this truly has been a win-win situation between the United States
1501 and Mexico as it pertains to energy trade.

1502 In fact, in the most recent year that I've seen the numbers,
1503 there's actually been a trade surplus from U.S. products and
1504 services related to energy that go to Mexico.

1505 In fact, I think the last number what I saw was, roughly,
1506 an \$11 billion surplus on the side of the U.S. We are continuing
1507 to provide them with natural gas. We are continuing to provide
1508 them with other petro fuels sources, for example.

1509 If you look at gasoline, diesel, and other jet fuel
1510 resources, the United States has, roughly, a 90-day inventory
1511 supply. Mexico has two to three days.

1512 So there are more opportunities to build infrastructure in
1513 Mexico that can receive future U.S. products and that's one of
1514 the things that we are looking at.

1515 Mr. Green. Mr. Chairman, I know I am out of time but if --

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1516 Mr. Upton. We are going to have votes on the House floor
1517 shortly. So --

1518 Mr. Green. Okay. Well, I was just going to say that it's
1519 not just Mexico. It's also LNG exports. In fact, my joke is
1520 anybody in Louisiana and Texas who has a five-foot ditch off the
1521 Gulf of Mexico they want an LNG export facility.

1522 Thank you, Mr. Chairman.

1523 Mr. Upton. Gentleman's time has expired. Mr. McKinley.

1524 Mr. McKinley. Thank you, Mr. Chairman. Thank you for
1525 holding this meeting.

1526 As Dr. Yergin noted earlier in his testimony not only this
1527 time but previously, there is indeed an abundance of natural gas
1528 located in the Marcellus and Utica shale gases in West Virginia,
1529 Ohio, and Pennsylvania, and it's estimated that this region will
1530 produce about 37 percent of the nation's natural gas production
1531 by the year 2040.

1532 These shale gases underscore this potential of a historic
1533 renaissance that he referred to in American energy. But as we've
1534 heard earlier, the naysayer continue to trot out their tired
1535 disproven talking points.

1536 Unfortunately, the facts have proved otherwise. Just the
1537 last 10 years, CO2 emissions in America have gone down by 20
1538 percent.

1539 Shale gas has given the Appalachian area a breath of fresh
1540 air, perhaps a chance finally to transform and revitalize a whole

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

region of the country, and subsequently Rick Perry and the DOE have concluded that there's a need, perhaps, to develop a second petro chemical center located in the Appalachian region.

A recent study by HSS Market have concluded that the economic advantages of extracting ethane in the Appalachian region has concluded that the resin could be produced at 23 percent lower there than being shipped down to the Gulf Coast to the crackers and back up. So I think that was interesting conclusion with that.

Now, we can achieve lower energy costs and dramatically decrease it if we take a different approach and work together.

Congress should full innovate research to reduce emissions -- the concern, Dr. Kennedy, you're concerned about -- if we just put the money into research.

The technology of American scientists developing higher efficiency and low emissions could be sold around the world -- marketed around the world -- and thereby address this worldwide concern about greenhouse gases, because we've got to remember the world is going to increase its energy production and use by 28 percent by 2040 and fossil fuels by will count still for 75 percent of the energy use.

So what my concern is, if that's the case, what are we doing with China and India? Isn't it time that some of our members recognize -- some of our members recognize that until the rest of the world, especially India and China, produces electricity

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1566 more cleanly, continuing to over regulate fossil be in America
1567 will have virtually no effect on the global environment.

1568 Therefore, shouldn't we be first -- innovate first, do the
1569 research, then regulate?

1570 So, Dr. Yergin, with this shale gas present, this revolution
1571 going on in Kentucky, Ohio, and West Virginia, what potential do
1572 you see for a potential petro chemical industry up in the
1573 Appalachian area and with projection they're saying as much as
1574 \$36 billion invested and maybe 100,000 jobs? Do you believe that.

1575 Mr. Yergin. Some people see the Marcellus, now the region
1576 in the Utica as the largest gas field or gas concentration in the
1577 world.

1578 I thought that some companies had actually committed to build
1579 petro chemical facilities there. I thought Shell was doing it
1580 but you have a --

1581 Mr. McKinley. Shell is doing it in Monaca, Pennsylvania.
1582 That's one portion of it, but there are others. I know they're
1583 doing some -- the ethane storage hub that we've been promoting
1584 here has been the -- the question is whether or not any of you
1585 have the realization that could this be a center of a secondary?

1586 We are not trying to replace Houston, but just is there a
1587 secondary -- is there a second -- possibility of a secondary?

1588 Mr. Yergin. Yes. Sure. I mean, the resources is so
1589 enormous there. I mean, as you said, it's going to be such a large
1590 part.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1591 Also, I did want to say -- you mentioned the R and D. One
1592 of the big themes over at the World Gas Congress has been
1593 specifically about methane and applying the technologies to
1594 address methane.

1595 So, I mean, there is definitely a research agenda to address
1596 the questions you're talking about including methane.

1597 Mr. McKinley. Dr. Arriola, any comments from you?

1598 Mr. Arriola. I really don't have anything to add on that
1599 other than given the infrastructure that we have and lacking
1600 pipelines in some parts of our country, it may make sense to
1601 develop those centers that you're talking about closer to the
1602 source themselves.

1603 So from an economies of scale standpoint, that could very
1604 well make sense.

1605 Mr. McKinley. Thank you, and I yield back my time.

1606 Mr. Upton. Gentleman yields back. The gentleman from
1607 Vermont, Mr. Welch.

1608 Mr. Welch. Thank you very much. I thank the panel.

1609 Mr. Yergin, your opening statement indicated with the shale
1610 gale it just has been a huge game changer in jobs and economic
1611 activity in our ability to go from being an importer to an
1612 exporter, maybe the largest one.

1613 One of the other issues, though, that I would like to focus
1614 on is energy efficiency. I mean, it's tremendous that we have
1615 these resources and it creates the economic activity and the jobs.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1616 But some of us are concerned also about carbon emissions and
1617 the impact that has, and my understanding is that the energy
1618 efficiency policies that we've been able, and I've worked a lot
1619 with Mr. McKinley on this actually -- energy efficiency has
1620 allowed us to save on the demand for energy.

1621 The Alliance to Save Energy says that if we tried to run
1622 today's economy without energy efficiency improvements that have
1623 taken place in '73, we'd need 55 percent more energy supplies than
1624 we now use.

1625 Could you describe what you understand to be the Trump
1626 administration policies on energy efficiency, A, and, B, whether
1627 even as we exploit the shale gale, does that suggest that we can
1628 take our eye off the importance of efficiency?

1629 Mr. Yergin. I am not really in a position to address what
1630 the -- you know, because I haven't studied what the Trump
1631 administration's specific policies are.

1632 I do agree with you. When I began my work in energy, it was
1633 based -- focused on energy efficiency and, off the top of my head,
1634 I would say that we are probably twice as energy efficient today
1635 as a country than we were, you know, a few decades ago.

1636 So I think energy efficiency is a very important -- you know,
1637 I regard energy efficiency as another energy source.

1638 Mr. Welch. And my is the energy companies have to be part
1639 of the solution. They have to be, and I am wondering -- you're
1640 over at the meeting with the gas folks -- 12,000 people -- are

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1641 there any topics that are being discussed specifically as to
1642 energy efficiency?

1643 Mr. Yergin. Well, in the speeches I heard, it was certainly
1644 said that, you know, this has to be a big part of the energy mix
1645 and, you know, if we hadn't become more efficient as a country,
1646 we would be in a -- we would also be in a very difficult place.

1647 The thing about energy efficiency so much, it's -- you know,
1648 it's -- it goes through the entire economy. It's decisions that
1649 people make when they build houses.

1650 It's new processes in industry. What's always struck me
1651 about it, it's a very decentralized activity. There has been a
1652 general trend towards being more efficient.

1653 Mr. Welch. Is there a place for appropriate regulation in
1654 order to meet energy efficiency standards, Mr. Yergin?

1655 Mr. Yergin. Yes. I mean, you can see it, for instance, in
1656 housing and other places and that regulation has been part of the
1657 mix.

1658 Mr. Welch. Thank you. Mr. Arriola, would you agree with
1659 that, I mean, as the representative of a major energy company?

1660 Mr. Arriola. Yes. What we see, Congressman, is a lot of
1661 that regulation happens state by state. So, for example, in
1662 California, whether it's the housing codes or through our Public
1663 Utilities Commission, there's a lot of work that goes on in energy
1664 efficiency.

1665 Mr. Welch. So, you know, there's --

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1666 Mr. Arriola. And our companies are directly involved to
1667 help facilitate that.

1668 Mr. Welch. All right. Mr. Hamm, I know you have been
1669 supportive of the president's deregulatory agenda. We've heard
1670 some testimony here about the appropriate use of regulations like
1671 Energy Star.

1672 Do you support that?

1673 Mr. Hamm. Well, you know, the best efficiencies is gained
1674 by the private sector. You know, for instance, in 2014 we had
1675 1,950 rigs working. Today, we've got a thousand rigs doing the
1676 same job.

1677 So, basically, you have got one rig as efficient as five were
1678 in the 1990s. So that's efficiencies that you can gain from the
1679 private sector --

1680 Mr. Welch. Well, that's efficiency in the exploitation
1681 process, not in the use process, right? Now, do you believe that
1682 EPA has a role -- the Environmental Protection Agency -- in
1683 promulgating appropriate regulatory mechanisms for energy
1684 efficiency?

1685 Mr. Hamm. I don't think they -- EPA is there to enforce the
1686 law and basically ensure that rule of law is followed, and so they
1687 have that job to do and they do it sometimes very well, most of
1688 the time very well. But as far as efficiencies --

1689 Mr. Welch. Right. I just have time for one more question.
1690 What's your view on the president's tariffs on oil exports to China

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1691 -- or the China retaliatory tariffs on us with respect to our oil
1692 exports?

1693 Mr. Hamm. Well, right now, we don't have tariffs that apply
1694 to oil going to China, and we'll see if that happens or not.

1695 Mr. Welch. Are you -- are you okay with the tariffs? Do
1696 you think that's a good thing for business?

1697 Mr. Hamm. Am I okay with tariffs? I do not -- I think
1698 tariffs are counterproductive. I think everybody here believes
1699 that.

1700 What's going on right now is setting some of that straight.
1701 You know, the countries have gotten too carried away with tariffs
1702 in the past. Nothing was done about it, and so some of those
1703 corrections are being made today.

1704 Mr. Welch. I yield back. Thank you.

1705 Mr. Upton. Gentleman's time has expired. Mr. Griffith.

1706 Mr. Griffith. I thank the gentleman and appreciate it. Dr.
1707 Yergin, appreciate you being here today. I got a couple questions
1708 in that regard with the geopolitical aspects of all of this.

1709 So we've heard a lot about foreign countries, and Mr.
1710 McKinley touched base on it, and we were talking with one of the
1711 foreign countries earlier today.

1712 But isn't it true that if we were suddenly to cut off American
1713 gas exports that a lot of the countries, particularly some of the
1714 developing economies, would just continue to use coal from other
1715 parts of the world?

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1716 Mr. Yergin. Well, I think -- I mean, we are just part and
1717 we are still a beginning part of the LNG market. We'll have more
1718 when you guys get going.

1719 But I think there is -- you know, there's a competition going
1720 on on a global basis for, you know, what's going to be the balance
1721 between coal and natural gas and renewables for developing
1722 countries, and I think many of them -- you know, there's definitely
1723 a push towards using more gas.

1724 We see 15, 20 countries are going to -- that don't import
1725 LNG now will import LNG because they want to have -- clean up and
1726 not use -- clean up their electric generation.

1727 Mr. Griffith. And one of the questions that I would have
1728 as we look at this is as we go to using the LNG, are we able to
1729 compete worldwide with that?

1730 Because, obviously, and I represent a coal district like Mr.
1731 McKinley does as well -- obviously, you know, it doesn't make sense
1732 very often unless you need some good high-quality, as they called
1733 it this morning, coking coal.

1734 But the -- what we call metallurgical coal in my neck of the
1735 woods -- unless you need that, if you're just buying steam coal,
1736 it's hard to buy that for basic energy in some parts of the world
1737 -- hard for us to ship it to them and compete against the
1738 Australians, and insert about four or five other countries.

1739 But from what I understand -- you correct me if I am wrong
1740 -- our LNG resources can reach worldwide and be pretty competitive

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1741 wherever we go. Isn't that true?

1742 Mr. Yergin. Yes. We are quite competitive in the market.
1743 You know, we are maybe not as competitive as some pipeline
1744 suppliers in Europe.

1745 But there's definite -- I mean, I saw it this morning at this
1746 APEC conference with all these Asian countries. They're really
1747 interested in important LNG from the United States.

1748 Mr. McKinley. And I think that makes a lot of sense, and
1749 as a part of that, I would have to say that while I don't have
1750 any of the Marcellus.

1751 DOE, earlier this year, announced a project in conjunction
1752 with Virginia Tech in my district to investigate the resources
1753 -- the resource potential for reservoirs in the Nora Gas Field
1754 in southwest Virginia, and I am excited that this research is being
1755 conducted to improve our understanding.

1756 But it appears that we are down another level from what
1757 they've looked at before and so they're drilling some deep mines
1758 or some deep wells to see what we have down there, and we are
1759 excited about that because we have coal bed methane but we haven't
1760 been doing much on any other gas.

1761 We don't have the Marcellus or the Utica shale. But we may
1762 have this and we are excited about that. We already have some
1763 petro chemicals -- Eastman Chemical, even though it's in
1764 Kingsport, Tennessee, and people say, why are you interested in
1765 it.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1766 They have 10,000 employees and a thousand of them drive the
1767 eight miles from my district to the plant. So we are excited about
1768 that.

1769 But I think it's important that we realize that, as we move
1770 forward, this is important for the world. I also would echo some
1771 of the comments my colleagues have made that we need to do the
1772 research, because it's not just the United States that we are
1773 dealing with.

1774 It's the world and we are looking at global warming, et
1775 cetera. If we don't provide the research to burn our fuels more
1776 efficiently worldwide, and something that the rest of the world
1777 can also afford and obtain, then they're going to continue to burn
1778 coal.

1779 They're going to continue to burn all kinds of products and
1780 put stuff in the air, and I know it bores people but it's just
1781 my favourite factoid of all time.

1782 NASA did a study. They followed a sandstorm from Central
1783 Asia in the middle of the Gobi Desert, and it takes 10 days for
1784 the air to get from the middle of the Gobi Desert to the eastern
1785 shore of Virginia, based on their satellite research.

1786 So we need to work on this from a worldwide viewpoint and
1787 not put American jobs out of business because we are trying to
1788 set the standard, because the rest of the world is looking for
1789 jobs, period, and if they have to use something improper or less
1790 efficient they'll do it.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1791 But if we can find a way to do it through research they'll
1792 share in that. Everybody wants to have a cleaner world, but they
1793 want to have jobs first because the number-one -- the number-one
1794 thing is to have jobs and that helps your health as well.

1795 Wouldn't that be correct, Dr. Yergin?

1796 Mr. Yergin. Yes, and I love your factoid. I've never heard
1797 that before.

1798 Mr. McKinley. It's a fun factoid. All right. I yield
1799 back.

1800 Mr. Upton. Mr. Walberg.

1801 Mr. Walberg. Thank you, Mr. Chairman, and thanks to the
1802 panel for being here.

1803 Mr. Yergin, in your testimony you mentioned that by 2025 as
1804 many as 4 million jobs -- direct, indirect, and induced -- could
1805 be supported by unconventional oil and gas activities.

1806 Could you explain in further detail for us the types of jobs
1807 that are supported by unconventional oil and gas activities?

1808 Mr. Yergin. Well, those three categories are really
1809 categories that the Department of Commerce uses. The direct jobs
1810 would be working on one of Harold Hamm's rigs, working in the oil
1811 field.

1812 Indirect would be kind of service jobs supporting that, and
1813 then the induced jobs is the money that flows into the community
1814 because, as we've seen in Pennsylvania, suddenly people are able
1815 to buy cars, are able to buy houses.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1816 Realtors service computer specialists in California,
1817 financial people in New York, and so that's kind of the methodology
1818 that's used for estimating that, and what it really says that these
1819 supply chains go all the way the across the country and the money
1820 that's being spent is staying in this country and being
1821 distributed in our economy.

1822 Mr. Walberg. Moving along with that, several of you
1823 mentioned the numbers of jobs -- direct, indirect, in construction
1824 as well as exploration for finding all that go on there.

1825 Let me ask Mr. Hamm and Mr. Arriola, what types of job
1826 training and recruitment efforts are you using to meet those
1827 needs?

1828 I mean, we see all across the vocational spectrum today a
1829 real lack of people to do the jobs -- real rural jobs that we need
1830 -- and what are you doing to train people for the jobs?

1831 Mr. Arriola. Congressman, I can tell you, in the case of
1832 the LNG facilities that we are talking about, we work very closely,
1833 obviously, with our subcontractors that are hiring people but we
1834 are also working directly with the trades to train people, whether
1835 it's welders, whether it's supply procurement experts.

1836 There's a whole host of jobs, whether they're low skilled
1837 or high skilled that we are trying to do, and I think one of the
1838 great things is we are creating a pipeline of skilled workers that
1839 -- especially in some of these areas that workers that wouldn't
1840 necessarily have opportunities that can now go from facility to

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1841 facility to continue to build.

1842 So sometimes we think of these as temporary jobs but they're
1843 really skills that are being developed that can be utilized across
1844 the construction industry to continue to build energy
1845 infrastructure.

1846 Mr. Walberg. So you're working with the trades. What other
1847 -- I mean --

1848 Mr. Arriola. We are working with the trades in the case of
1849 our utilities where we are enhancing pipelines to carry natural
1850 gas.

1851 We are working with the junior colleges and other
1852 organizations to identify people that are coming directly out of
1853 high school or junior colleges to give them the skills that they
1854 need to be able to be productive members of our team.

1855 Mr. Walberg. Mr. Hamm, I would ask you if you'd respond as
1856 well, especially since being an innovator -- innovation in
1857 directional drilling and all of that.

1858 Mr. Hamm. Thank you. What we've seen, really, that added
1859 so many new jobs is these very expensive petro chemical plants
1860 that have been added with all the natural gas resources that we
1861 have.

1862 In fact, it's been estimated that one out of eight people,
1863 you know, have been associated with our industry. So it's very
1864 intense, particularly in Houston and some of the areas that these
1865 plants locate.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1866 And so it's very intense. Vocational technical training has
1867 helped a great deal in places like Oklahoma. As far as our
1868 industry goes, it's been a great resource.

1869 But it seems like the -- you know, we are down to about 3.8
1870 percent of unemployment in this country now, which is wonderful,
1871 and the closer you get to the 3 percent level, the harder it is
1872 to find those employees that you need.

1873 But so far, we've been able to do it.

1874 Mr. Walberg. Recruit and train your own? Is that how you
1875 --

1876 Mr. Hamm. We recruit and we've trained. We train both at
1877 the company level and then also we use technical schools for
1878 training as well.

1879 Mr. Walberg. Thank you. I yield back.

1880 Mr. Upton. Mr. Duncan.

1881 Mr. Duncan. Thank you, Mr. Chairman. Thanks, everyone,
1882 for being here. It's been a great hearing so far. As we all know,
1883 the United States is well on our way to becoming a net energy
1884 exporter by 2020 -- I think a natural gas exporter -- it was the
1885 first time last year -- first time since 1957, I believe.

1886 I commend the Trump administration's support for robust
1887 domestic energy production, which has consequently strengthened
1888 our leadership on the world stage.

1889 Mr. Arriola, you note in your testimony that the failure of
1890 the U.S. to seize the current LNG opportunity has international

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1891 implications.

1892 I couldn't agree with you more, and besides the fact
1893 exporting gas to U.S. allies will contribute up to 452,000
1894 American jobs from 2016 and 2035, add about \$73.6 billion annually
1895 to the U.S. economy. It can also provide energy security to our
1896 allies.

1897 Prior to serving on the Energy and Commerce Committee, I
1898 served as chairman of the Western Hemisphere Subcommittee on the
1899 House Foreign Affairs Committee and I utilized that role as that
1900 chairman to focus on energy opportunities in North and South
1901 America and how we can work to achieve not only America energy
1902 independence and energy security but also hemispheric energy
1903 security and independence.

1904 In this region of the world, we have the ability through U.S.
1905 LNG exports to help the energy poor. Countries reduce their
1906 dependence on corrupt state-owned regimes and increase the
1907 quality of life for so many people around the world.

1908 I talk about quality of life a lot of times, how energy can
1909 improve the quality of lives. Just in infant mortality rate --
1910 through energy and a constant 24/7 baseload power supply that that
1911 energy, possibly with LNG natural gas-fired power plants
1912 providing that electricity can keep babies. Where you have
1913 intermittent power now in neonatal intensive care and incubators
1914 cannot run to keep those babies alive, you see a high infant
1915 mortality rate.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1916 A lot of quality of life issues that we, as Americans, with
1917 our energy -- abundant energy resources, exporting those to our
1918 friends and allies around the world to improve the quality of life
1919 of folks elsewhere.

1920 So, Mr. Arriola, from your perspective, how can LNG terminals
1921 further open up access for U.S. LNG in these markets?

1922 Mr. Arriola. Well, Congressman, your point about natural
1923 gas and different types of energy impacting more than just the
1924 economic side is truly right on.

1925 In fact, I saw -- I spoke to a professor from the Stanford
1926 Natural Gas Initiative yesterday and he shared with me in a
1927 conference we were at that, although we don't talk about it very
1928 much, indoor air pollution is one of the largest killers in this
1929 world, and we don't think about it here in the United States
1930 because we have, for the most part, natural gas or electricity
1931 to help, from a cooking fuels perspective.

1932 But if you go to other countries -- developing countries,
1933 they use wood. They use dung. They use charcoal, and last year,
1934 roughly, 4 million people died from indoor air pollution caused
1935 by cooking fuel.

1936 Mr. Duncan. And I am glad you said that. I talk about that
1937 all the time. The indoor air quality is terrible when you're
1938 burning on wood, charcoal, dung, other things that people around
1939 the world have to cook on, and the fact that they don't have a
1940 24/7 baseload power supply to keep their food fresh in a

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1941 refrigerated environment.

1942 Mr. Arriola. So not only are we impacting economic
1943 prosperity around the globe by being able to export clean U.S.
1944 natural gas, but we are changing people's lives. We are changing
1945 the health and their livelihood.

1946 Mr. Duncan. Improving lives of so many people around the
1947 world through American resources that we take for granted. We
1948 take for granted that that light is going to come on when we flip
1949 the switch.

1950 We take for granted that the machines of industry to produce
1951 the widgets that America produces -- that that electricity is
1952 going to be there to provide for those machineries to turn on.

1953 But you know what? It's not just a third world problem. Even
1954 in second world and first world Europe they have problems with
1955 intermittency and power supplies.

1956 So this is geopolitics of American energy. When I was in
1957 Spain -- and I understand Portugal is the same way -- but they
1958 want to be the LNG importer for Western Europe because right now,
1959 Western Europe is relying on who? Russia.

1960 Russia is a gas station masquerading as a country. But
1961 they're providing that natural gas to Europe and they use the
1962 levers of influence of turning that spigot on and off to affect
1963 policy not only in Eastern Europe but in Western Europe, and as
1964 those pipelines continue to be built to provide that natural gas,
1965 Western Europe is looking west to the United States, a stable

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

energy producer, an ally and a friend, to provide LNG so they can meet their energy needs and lessen their dependence not on the Middle East for their energy but lessen their dependence on Russia and their less dependence on Russian gas and more strong dependence on, possibly, hopefully, American LNG exports to provide that energy.

So the geopolitics are real. I appreciate your comments, and let's improve the lives of folks around the world through American energy production.

With that, Mr. Chairman, I yield back.

Mr. Upton. The gentleman yields back. I regret to say that votes on the floor have started again. They're not going to be completed, they tell us, until after 4:00 o'clock.

I know a couple of our witnesses have to leave by 3:45. So I am going to ask that Mr. Olson, who's next in line for questions, take the chair and he will ask questions, at which point we will adjourn, and those members wishing to still ask questions will do it in writing, and if you could respond on a timely basis we'll adjourn rather than keep you here until 4:15, knowing that all of you are pretty much gone.

Mr. Olson.

Mr. Olson. [Presiding.] I thank the chair, and welcome to our four witnesses.

I want to start by saying congratulations to our friends at -- our good friends at Sempra. Big merger with Oncor.

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

1991 Congratulations.

1992 Mr. Arriola. Thank you.

1993 Mr. Olson. Mr. Arriola, your company is working on some
1994 significant LNG export terminals along the Gulf Coast. You
1995 mentioned Cameron being up and running, Port Arthur coming online.

1996 Can you talk about why getting American liquefied natural
1997 gas to market is time sensitive? Why does it matter how fast we
1998 ramp this production up? What markets are in jeopardy if we delay
1999 or drag this out?

2000 Mr. Arriola. Sure, Congressman.

2001 I think, as we've discussed, when foreign countries decide
2002 to enter into contracts for LNG, they're ordinarily in the 20-
2003 to 30-year time frame. And so as I am buying a product or a service
2004 for 20 or 30 years, I don't need to come back every year and re-up.

2005 And so as U.S. companies, including Sempra, look at building
2006 a project, whether it's in Cameron or in Port Arthur, we are really
2007 focused on trying to get all those contracts together up front
2008 so that we can get them financed and to build the project.

2009 If we can't get those projects this year or next year because
2010 somebody else has already signed up these 20- to 30-year
2011 contracts, we are out of the market, and the construction jobs
2012 that we've been talking about and the impact to the local economy
2013 goes away, or never develops, I should say.

2014 Mr. Olson. Yes. Thousands and thousands of American jobs.

2015 Mr. Hamm, the people back home in Texas 22 want me to thank you

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

2016 for your efforts in the Bakken shale play to change the entire
2017 world and America's energy future.

2018 We are now an energy dominant country because of you, Mr.
2019 Hamm, and a Texan named George Mitchell at the Barnett shale play.

2020 My question is, can you talk about the most important actions
2021 that the Trump administration can take to help you with oil and
2022 gas production?

2023 You mentioned adjusting the CAFE standards, ACC. How about
2024 public lands, capturing other things? What can we do to help you
2025 out and make sure this production continues and doesn't get
2026 stifled by Washington, D.C.?

2027 Mr. Hamm. Well, we have a friendly audience here that
2028 listened to us today, which is good. We need to do a lot with
2029 federal lands. They should also participate in this energy
2030 renaissance, and they haven't up to this point.

2031 The bulk of what has been done has been on fee lands,
2032 particularly in the Bakken and Texas, and we need to get it where
2033 permitting could be done rapidly instead of waiting, you know,
2034 six months to a year and so that's one thing we are working on
2035 that.

2036 And we have an audience that's listening and wanting to do
2037 the right thing. So I think we are moving in the right direction.
2038 We just need to keep the ball rolling to get it corrected while
2039 we are doing it.

2040 Mr. Olson. Yes, and thank you for your example of what the

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

2041 private sector can do. The private sector developed directional
2042 drilling and hydraulic fracturing.

2043 That wasn't something that came from D.C. That came from
2044 Harold Hamm and George Mitchell. So thank you for that.

2045 My final question is for you, Dr. Yergin. Let's talk about
2046 CERAWeek. It used to be CERADay, maybe CERAHour in 19, what, 83?
2047 You got that ball rolling, and now it rolled into the energy
2048 capital of the entire world -- Houston, Texas.

2049 Your testimony mentioned how the revolution in shale oil and
2050 gas -- the shale gale -- has had enormous impact on our
2051 relationships abroad.

2052 I've seen that firsthand. You mentioned India. I went
2053 there this past March. Their motto is, natural gas for today --
2054 renewables for the future.

2055 But as you mentioned, right now they've signed a contract
2056 for 20 years of liquefied natural gas I think somewhere about 14.4
2057 million metric tons from America to India. That helps them get
2058 their air cleaner. It helps them where they want to go.

2059 Also, as you mentioned, they've got, I heard, 2 million
2060 barrels of American crude oil that they haven't had for almost
2061 50 years. They are taking the wood to OPEC and Russia with our
2062 energy.

2063 And so my questions are can you tell me more details about
2064 what that means for allies? We can help out India. We can help
2065 out South Korea, Japan, even help out China getting their air

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

2066 cleaner. How can we use this energy renaissance to make the world
2067 better?

2068 Mr. Yergin. I think, first of all, by helping to reduce
2069 conflict.

2070 Secondly, I think it builds confidence. I think it really
2071 -- what's happened here in the United States is actually a big
2072 contribution to energy security for the whole world and we benefit
2073 from that.

2074 So I think it radiates out from it, and I think what you
2075 described in India -- I've seen it in other countries, too -- it
2076 gives a -- they have a deeper relationship with the United States
2077 and it connects them more to us, and I think that's very beneficial
2078 for our overall political situation in the world.

2079 Mr. Olson. One example -- Mr. Shimkus signed this poster
2080 on the floor last week -- this big tanker ship called Independence
2081 was pulled into Lithuania.

2082 Probably 500 people -- normal people from Lithuania -- were
2083 greeting this tanker ship going, yay, yay. That's because they
2084 know that takes Mr. Putin's weapon away from him forever.

2085 Mr. Yergin. Well, I think it's -- I think it's true that
2086 what's happened with LNG to Europe -- and it's not only us but
2087 from others -- it's really, in a sense, depoliticized -- it turns
2088 Europe more into a gas market and takes out the kind of political
2089 implications for it.

2090 So I think it's something that's very welcome in those

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com

2091 countries -- that they know that we are there and we are their
2092 friend.

2093 Mr. Olson. I am out of time.

2094 Just one warning, sir -- my Houston Astros will beat the
2095 Boston Red Sox again this year, going for the World Series.

2096 Mr. Yergin. What a forecaster.

2097 [Laughter.]

2098 Mr. Olson. Pursuant to committee rules, I remind members
2099 that they have 10 business days to submit additional questions
2100 for the record.

2101 I would ask that witnesses submit their answers -- their
2102 responses -- within 10 business days upon receipt of those
2103 questions.

2104 Without objection, this subcommittee is adjourned.

2105 [Whereupon, at 3:36 p.m., the committee was adjourned.]

NEAL R. GROSS

COURT REPORTERS AND TRANSCRIBERS
1323 RHODE ISLAND AVE., N.W.
WASHINGTON, D.C. 20005-3701

(202) 234-4433

www.nealrgross.com