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4 ``AMERICAN ENERGY SECURITY AND INNOVATION: AN ASSESSMENT OF
5 NORTH AMERICA'S ENERGY RESOURCES''
6 TUESDAY, FEBRUARY 5, 2013
7 House of Representatives,
8 Subcommittee on Energy and Power
9 Committee on Energy and Commerce
10 Washington, D.C.

11 The Subcommittee met, pursuant to call, at 10:08 a.m.,
12 in Room 2322 of the Rayburn House Office Building, Hon. Ed
13 Whitfield [Chairman of the Subcommittee] presiding.

14 Members present: Representatives Whitfield, Scalise,
15 Shimkus, Pitts, Terry, Burgess, Latta, Cassidy, Olson,
16 McKinley, Gardner, Pompeo, Kinzinger, Griffith, Barton, Upton
17 (ex officio), Rush, Tonko, Markey, Engel, Green, Capps,
18 Doyle, Barrow, Matsui, Christensen, Castor and Waxman (ex

19 officio).

20 Staff present: Nick Abraham, Legislative Clerk; Gary
21 Andres, Staff Director; Charlotte Baker, Press Secretary;
22 Mike Bloomquist, General Counsel; Sean Bonyun, Communications
23 Director; Matt Bravo, Professional Staff Member; Allison
24 Busbee, Policy Coordinator, Energy and Power; Patrick
25 Currier, Counsel, Energy and Power; Tom Hassenboehler, Chief
26 Counsel, Energy and Power; Heidi King, Chief Economist; Ben
27 Lieberman, Counsel, Energy and Power; David McCarthy, Chief
28 Counsel, Environment/Economy; Gib Mullan, Chief Counsel,
29 Commerce, Manufacturing, and Trade; Mary Neumayr, Senior
30 Energy Counsel; Andrew Powaleny, Deputy Press Secretary;
31 Krista Rosenthal, Counsel to Chairman Emeritus; Chris
32 Sarley, Policy Coordinator, Environment and Economy; Phil
33 Barnett, Democratic Staff Director; Alison Cassady,
34 Democratic Senior Professional Staff Member; Greg Dotson,
35 Democratic Energy and Environment Staff Director; Kristina
36 Friedman, EPA Detailee; Caitlin Haberman, Democratic Policy
37 Analyst; and Alexandra Teitz, Democrat Senior Counsel, Energy
38 and Environment.

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39 Mr. {Whitfield.} I would like to call this hearing to
40 order this morning, and I certainly want to welcome our panel
41 of witnesses and also I want to welcome all the members back
42 on the subcommittee. I look forward to another 2 years with
43 the ranking member, Mr. Rush. And also, we are really
44 excited to have three new members on the Republican side
45 joining our subcommittee for the first time, Mr. Latta of
46 Ohio and Mr. Cassidy of Louisiana and also Mr. Kinzinger of
47 Illinois. We are delighted that they are on this
48 subcommittee and look forward to working with them on
49 important issues facing our Nation in the energy sector as
50 well as all the members of the subcommittee, Democrat and
51 Republican.

52 The title of today's hearing is ``American Energy
53 Security and Innovation,'', and we are going to focus on an
54 assessment of North America's energy resources. I think all
55 of us agree that we have many problems facing our country
56 today but one of the primary ones that we have is a sluggish
57 economy and we want to be sure that we take every action
58 possible to stimulate the economy and create more jobs.
59 Certainly, we are very much aware in the last quarter our GDP
60 decreased by .1 percent. Our unemployment has ticked up from
61 7.8 to 7.9 percent, and so we all face this challenge of

62 adopting policies and taking actions that can help stimulate
63 the economy.

64 Certainly, one of the primary factors that affects the
65 economy is energy policy, and certainly there are other
66 factors as well but that plays a vital role. I was reminded
67 as I read the testimony last night that it wasn't too many
68 years ago when people throughout the country, experts and
69 otherwise, were talking about the United States fossil fuels,
70 for example, their resources were being depleted. We were
71 running out of oil, we were running out of natural gas and we
72 were going to have to be importing more. As a matter of
73 fact, in January 2007, a CEO of one of our largest utility
74 companies made the comment that we were running out of
75 natural gas, production was declining and demand growing so
76 he expected that imports would go from 3 percent of our
77 national needs to 24 percent in 2020. And then of course, we
78 know what has happened. We have had all sorts of new
79 discoveries--the Bakken field, the Eagle Ford, developments
80 in Colorado--and most of these shale fields have been
81 discovered on private lands, and even though the number of
82 permits on public lands has gone down, the production on
83 private lands has increased dramatically.

84 So this is a real game changer, the possibility of a
85 game changer in America. We have heard the term for many,

86 many years, we have the opportunity to be energy independent,
87 and that is actually the reality today, and I tell you what,
88 people around the world are focused on it too because some of
89 our witnesses today attended the World Economic Forum in
90 Davos, and we know that many Europeans are expressing great
91 concern about the abundance of energy that we have in America
92 and their ability to compete in the global marketplace
93 because their energy costs are going up in Europe and we have
94 the opportunity to decrease our energy costs because of this
95 abundance of fossil fuels that we have.

96 Now, we all recognize that we have renewable that can
97 play a role as well, but I am not going to be an alarmist
98 about the increased use of fossil fuel because our carbon
99 dioxide emissions today are lower than they have been in
100 America in 20 years, which shows that the marketplace can
101 continue to play a vital role, our expertise in technology
102 continues to improve and so in oil, in natural gas and in
103 coal, we have abundant resources that can meet the needs of
104 this country on the electricity side and the transportation
105 side for years and years to come.

106 So we have a unique opportunity and the policies that we
107 adopt at the government level will determine whether or not
108 we are going to be successful in America, and some of the
109 policies, there is a lot of disagreement on this committee

110 about aggressive EPA should be. I was reading some court
111 decisions over the last couple of weeks. There were a total
112 of eight of them in which the court language was very strong
113 in chastising EPA for being overly aggressive and exceeding
114 their legal authority, and yet they have had good policies as
115 well and America does not have to take a back seat to anyone,
116 to any country for our enforcement of environmental laws.
117 But our objective is, we want a balanced approach. We don't
118 want to be an alarmist on climate change, for example, but we
119 want to protect our environment and we want to fully explore
120 the natural resources that we have which can go a long way
121 toward stimulating our economy and creating jobs for
122 Americans.

123 [The prepared statement of Mr. Whitfield follows:]

124 ***** COMMITTEE INSERT *****

|
125 Mr. {Whitfield.} With that, at this time I would like
126 to recognize the gentleman from Illinois, Mr. Rush, for 5
127 minutes.

128 Mr. {Rush.} I certainly want to thank you, Mr.
129 Chairman, and Mr. Chairman, I also want to join you in
130 welcoming all the new members of the subcommittee and those
131 who are returning, and I want to especially welcome the new
132 members on the Democratic side, Mr. McNerney, Mr. Tom Cole
133 and Mr. Barrow, Ms. Matsui and Ms. Christensen to this
134 subcommittee.

135 Mr. Chairman, I want to thank you for holding today's
136 hearing assessing North America's energy resources. As we
137 begin the subcommittee's work for the 113th Congress, I would
138 submit that it is critical for us as policymakers to
139 understand the changing landscape of our Nation's energy
140 supplies, not only as we move away from policies guided by
141 scarcity but also so that we can develop a comprehensive
142 energy plan for moving this Nation forward.

143 This subcommittee needs to get down to the serious
144 business of enacting an energy blueprint that will move this
145 country towards a truly all-of-the-above strategy that will
146 follow four basic principles: one, to provide safe, reliable
147 and affordable energy to all Americans; two, to provide

148 additional jobs and economic opportunities to all segments of
149 our population; three, a plan that will address the dire
150 consequences of climate change that scientists have been
151 warning us about for years now and which we have been seeing
152 more and more firsthand evidence of across this Nation; and
153 fourth, to set a path that would help us become self-
154 sufficient and energy independent over the next few decades.

155 Mr. Chairman, today we will hear from our expert
156 witnesses that domestic crude oil production has increased
157 significantly over the past few years with the EIA reporting
158 that U.S. crude oil production has increased from 5.1 million
159 barrels per day in 2007 to 6.4 million barrels per day in
160 2012, the highest level since 1997. The EIA reports that in
161 2005, the United States imported 60 percent of the petroleum
162 it consumed, and by 2012, that number had dropped to about 41
163 percent, the lowest level in decades. This decline can be
164 attributed primarily to increased domestic oil production,
165 the additional use of biofuels as well as the adoption of
166 higher fuel efficiency standards for vehicles. The EIA also
167 projects that the United States will reduce its reliance on
168 imported oil to less than 30 percent of consumption by 2035,
169 and U.S. natural gas production will increase by 44 percent
170 by 2040 due primarily to the projected growth in shale gas
171 production.

172 However, Mr. Chairman, in order to reach all the
173 necessary objectives of providing reliable energy, creating
174 new jobs, addressing climate change and also becoming energy
175 independent, it is imperative for this subcommittee to also
176 promote and to encourage renewable energy resources. The
177 NREL estimates that we could supply 80 percent of total U.S.
178 electricity generation from renewable energy generation
179 through technologies that are commercially available by the
180 year 2005.

181 Mr. Chairman, I welcome today's hearing, and we move
182 legislatively, I will urge this subcommittee to promote a
183 truly all-of-the-above energy policy that includes renewables
184 and clean energy sources as well as traditional carbon-
185 intensive fossil fuels before the time is too late, Mr.
186 Chairman, too late to act.

187 I thank you, and I really look forward to hearing from
188 today's witnesses and I yield back the balance of my time.

189 [The prepared statement of Mr. Rush follows:]

190 ***** COMMITTEE INSERT *****

|
191 Mr. {Whitfield.} Thank you, Mr. Rush. We appreciate
192 that opening statement.

193 At this time I recognize the chairman of the full
194 committee, the gentleman from Michigan, Mr. Upton, for 5
195 minutes.

196 The {Chairman.} Well, thank you, Mr. Chairman.

197 Certainly, this hearing is a welcome one to examine the
198 positive developments resulting from advancements in
199 innovation and technology, the game-changing potential for
200 North American energy independence. What was once believed
201 to be unthinkable is certainly now within our grasp.

202 For 3 decades, 30 years, the American people have been
203 told that we are a Nation of declining resources at the mercy
204 of OPEC. The story was nearly as gloomy with natural gas
205 with forecasts of dwindling domestic supplies, higher prices,
206 and rising imports from the Middle East. In fact, in this
207 committee, many may remember when we crafted a new title in
208 the Energy Policy Act of 2005 to facilitate what we thought
209 would be the new norm: pending reliance on imported gas from
210 geopolitically unstable regions of the world, to add to our
211 growing reliance on OPEC oil. What a bad thing.

212 But thanks to American ingenuity and advanced
213 technologies, the trends in domestic oil and natural gas

214 production have in fact been turned upside down. In fact,
215 the United States is now the world's leading producer of
216 natural gas, and the IEA is predicting that by 2020, U.S. oil
217 production will exceed Saudi Arabia. 2020, let me repeat
218 that, we are going to exceed the production in Saudi Arabia.

219 Our overall energy landscape has changed dramatically in
220 just a short period of time, and it is not only rewriting the
221 economic outlook that we have as a Nation, but also beginning
222 to change the geopolitical nature of global energy economics.

223 Today, this subcommittee is launching a series of
224 hearings on energy security and innovation to hear from
225 experts who are working with the current realities. It is up
226 to us to ensure that our federal laws are not continuing to
227 introduce roadblock after roadblock to enhanced energy
228 security. We have got to remain steadfast in our support for
229 efforts to improve the infrastructure necessary to maximize
230 use of these resources, including the Keystone XL pipeline.
231 These issues are too important for our Nation to be looked at
232 in a vacuum, and if we don't take advantage of our energy
233 abundance, other nations are eagerly waiting to step in and
234 use North American energy to fuel their own growth.

235 The benefits of our emerging energy abundance are many,
236 boosting our economy and creating jobs across the nation, a
237 bright spot in the economic downturn. We have got to build

238 upon that progress. Once we have a more accurate sense of
239 North America's energy potential, we can start the process of
240 ensuring we have the proper vision for the future.

241 I yield the balance of my time to--anybody? Mr. Barton.

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

243 ***** COMMITTEE INSERT *****

|
244 Mr. {Barton.} Well, thank you, Mr. Chairman.

245 I want the record to show that I have my iPad and I am
246 trying to do this electronically, so I am at least trying.

247 I want to welcome our witnesses. I see former
248 Congressman Martin Frost out in the audience. He knows a
249 little bit about energy. We are glad to have you here,
250 Martin.

251 Today is an important hearing, Mr. Chairman. I
252 represent a Congressional district in Texas that at one time
253 had it been a nation would have been the fifth largest oil-
254 producing nation in the world. The first oil field west of
255 the Mississippi was discovered in my Congressional district
256 at Corsicana in 1895. As we speak today, in the Barnett
257 shale, which is not totally in my Congressional district,
258 there are over 16,000 producing natural gas wells, and last
259 year they produced in the neighborhood of 2 trillion cubic
260 feet of natural gas in that one field.

261 With the miracle of hydraulic fracturing, we have
262 unleashed a drilling and production revolution in this
263 country, not only in natural gas but now that technology is
264 being used in oil, and the State of North Dakota, which less
265 than 10 years ago had probably fewer than 200 or 300 oil
266 wells, is on track in that one State to produce over a

267 million barrels of oil in the very near future, possibly this
268 year. We can be energy independent if we want to. It is not
269 a question of can we. It is a question of, is it in our
270 economic and political self-interest to do so.

271 So today's hearing is an important hearing for the
272 American people to see the energy abundance that our Lord
273 blessed us with and the policymakers in this room and in this
274 city can decide what we want to do with it.

275 With that, Mr. Chairman, I yield back to you or any
276 other person.

277 [The prepared statement of Mr. Barton follows:]

278 ***** COMMITTEE INSERT *****

|
279 Mr. {Whitfield.} Thank you, Mr. Chairman.

280 At this time I would like to recognize the ranking
281 member of the full committee, Mr. Waxman of California, for 5
282 minutes.

283 Mr. {Waxman.} Thank you, Mr. Chairman. I appreciate we
284 are holding this hearing on North America's energy resources.
285 We are going to hear testimony about fossil and renewable
286 energy supplies in the United States, Canada and Mexico.

287 We are dramatically improving the efficiency of our use
288 of oil so we are using less of it. At the same time, we are
289 producing more domestic oil, which means we are importing
290 less oil from dangerous parts of the world. We are unlocking
291 new reserves of natural gas, which is helping to limit the
292 use of polluting coal and to increase the competitiveness of
293 our domestic industries. We have doubled our capacity to
294 generate renewable electricity from wind and solar in just 4
295 years, which has cut our pollution and invigorated clean
296 energy manufacturing.

297 These are all positive developments. The question we
298 must ask is whether we are on a sustainable course for the
299 years to come. In his inaugural address, President Obama
300 said that we must transition to a sustainable energy future.
301 He said we must respond to climate change, because to do

302 otherwise would ``betray our children and future
303 generations.'' As we debate our energy future, this
304 committee has a choice. It is an energy choice and a climate
305 policy choice, and ultimately it is a moral choice.

306 The biggest energy challenge we face as a country is
307 carbon pollution. We can't have a conversation about
308 America's energy policy without also having a conversation
309 about climate change. We have a rapidly diminishing window
310 of time to act to reduce our carbon pollution before the
311 catastrophic impacts of climate change are irreversible.

312 In November, the International Energy Agency published
313 its World Energy Outlook. IEA concluded that our current
314 global energy system is ``unsustainable.'' The International
315 Energy Agency found that ``the climate goal of limiting
316 warming to 2 degrees Celsius is becoming more difficult and
317 more costly with each year that passes.'' The International
318 Energy Agency also concluded that if the world does not take
319 action to reduce carbon pollution before 2017, then all the
320 allowable CO2 emissions would be locked in by energy
321 infrastructure existing at that time.

322 That means that the energy policy decisions we make
323 today will have a real and direct impact on whether we can
324 limit climate change in the future. Every decision to build
325 a new fossil fuel-fired power plant or construct a pipeline

326 to transport tar sands or drill for more oil off our Nation's
327 coasts has climate risks. We need to understand and weigh
328 those risks before we lock in infrastructure that will
329 produce carbon pollution for decades to come.

330 There is an appeal to the energy resources we are
331 discovering. We are stronger when we produce oil in the
332 United States than when we import it from Saudi Arabia. We
333 are better off when we produce our own natural gas than when
334 we import LNG. But we also must recognize that the world has
335 far more proven reserves of oil, gas and coal than we can
336 ever safely use. The atmosphere has a rapidly shrinking
337 capacity to safely absorb carbon. In fact, if we want to
338 have a reasonable chance of limiting average global warming
339 to 2 degrees Centigrade, or 3.6 degrees Fahrenheit, there is
340 an estimated five times more carbon in proven fossil fuel
341 reserves than we can release into the atmosphere. If we burn
342 all the known reserves of fossil fuel without new
343 technologies to sequester the carbon, the damage to the
344 planet would be immense.

345 The future will belong to the country that leads the
346 inevitable transition to the clean energy economy of
347 tomorrow. It is our responsibility to figure out how we make
348 sure our Nation is in the forefront of this change.

349 Mr. Chairman, this is a new Congress. I want to begin

350 it by offering to work with you as we grapple with these
351 incredibly serious challenges. I look forward to this
352 hearing and future hearings on this subject and to our
353 cooperation to deal with these problems in a bipartisan and a
354 balanced way.

355 Thank you. I yield back the time.

356 [The prepared statement of Mr. Waxman follows:]

357 ***** COMMITTEE INSERT *****

|
358 Mr. {Whitfield.} Thank you, Mr. Waxman. We appreciate
359 your opening statement.

360 I also want to welcome Joe Pitts of Pennsylvania, who is
361 a new member of this subcommittee. As many of you know, he
362 is the chairman of the Health Subcommittee, and we are
363 delighted to have him on the Energy and Power Subcommittee as
364 well. We do have a new vice chairman also, Steve Scalise,
365 who was here but I think stepped out for just a moment.

366 Right now I would like to get our witnesses. We are
367 thrilled with the panel that we have today. Each one of them
368 are real experts in various fields of energy and we genuinely
369 appreciate your testimony that you have prepared and that you
370 are about to give, and I know that everyone will have
371 questions for you, and at this time I would like to introduce
372 our panel of witnesses. First we have Adam Sieminski, who
373 has been here a number of times. He is the Administrator for
374 the United States Energy Information Administration, and we
375 welcome you. Dr. Daniel Yergin is Vice Chairman of IHS, and
376 many of you know Mr. Yergin also because he wrote a book
377 called The Prize, which won the Pulitzer Prize, so we are
378 delighted that he is here. We have Jennifer Morgan, who is
379 the Director of the Climate and Energy Program at the World
380 Resources Institute, and we look forward to your testimony,

381 Ms. Morgan. We have Mary Hutzler, who is a Distinguished
382 Senior Fellow at the Institute for Energy Research. I read
383 her testimony as well, and she has some great things to tell
384 us today. And then we have Mr. Harry Vidas, who is Vice
385 President for ICF International, and we appreciate your
386 thoughtful testimony as well, Mr. Vidas.

387 So each one of you will be given 5 minutes for your
388 opening statement, and there are a couple of little boxes
389 with lights, and when it is green that means go, and when it
390 is red, it means stop, but we will give you some leeway
391 because we do respect your being here and appreciate your
392 expertise.

393 So Mr. Sieminski, I will recognize you for 5 minutes for
394 your opening statement.

|
395 ^STATEMENTS OF HON. ADAM SIEMINSKI, ADMINISTRATOR, U.S.
396 ENERGY INFORMATION ADMINISTRATION; DANIEL YERGIN, VICE
397 CHAIRMAN, IHS; JENNIFER MORGAN, DIRECTOR, CLIMATE AND ENERGY
398 PROGRAM, WORLD RESOURCES INSTITUTE; MARY J. HUTZLER,
399 DISTINGUISHED SENIOR FELLOW, INSTITUTE FOR ENERGY RESEARCH;
400 AND E. HARRY VIDAS, VICE PRESIDENT, ICF INTERNATIONAL

|
401 ^STATEMENT OF ADAM SIEMINSKI

402 } Mr. {Sieminski.} Thank you, Mr. Chairman and members of
403 the subcommittee. I appreciate the opportunity to appear
404 before you today to discuss American energy security and
405 innovation. EIA is a statistical and analytical agency
406 within the U.S. Department of Energy. By law, its data,
407 analyses and forecast are independent of approval by any
408 officer or employee of the U.S. government.

409 My statement today summarizes recent trends in
410 production and draws on EIA's January short-term energy
411 outlook, and also, I am going to talk about resource
412 estimates for oil, gas, coal and renewables for the United
413 States.

414 As I discuss the different sectors, though, it is useful
415 to keep in mind that the methodologies for developing reserve

416 and resource estimates differ across the fuels. EIA
417 estimates that U.S. total crude oil production averaged 6.4
418 million barrels a day in 2012, an increase of .8 million
419 barrels a day, the largest actually since Colonel Drake
420 drilled the first commercial crude oil well up in Titusville,
421 Pennsylvania, Mr. Pitts, back in 1859, driven largely by
422 growth in tight oil production--now, that is in figure one of
423 my written statement, which is in the record. Drilling in
424 tight oil plays in North Dakota, Montana are expected to
425 account for the bulk of the forecast production growth over
426 the next 2 years. U.S. crude oil production could reach 8
427 million barrels a day in 2014, and with some very strong
428 assumptions about how drilling could proceed and other
429 factors, could get as high as 10 million barrels a day but
430 that is not currently in our reference case.

431 U.S. dry natural gas production has increased
432 consistently since 2005, mainly because of the production of
433 shale gas resources. Total marketed production averaged
434 about 69 billion cubic feet in 2012, and EIA expects
435 production will remain close to that level this year and next
436 year.

437 Crude oil and natural gas proved reserve additions in
438 2010 were the highest recorded since EIA began publishing
439 those numbers in 1977. Crude oil proved reserves increased

440 by 12.8 percent, almost 3 billion barrels, during 2010 to end
441 the year at over 25 billion barrels. U.S. proved reserves of
442 wet natural gas increased by almost 12 percent, or 34
443 trillion cubic feet, during 2010, ending that year at well
444 over 300 trillion cubic feet.

445 Next, I want to speak to the issue of oil and natural
446 gas resources. Estimates of technically recoverable
447 resources, while inherently uncertain, are a common measure
448 of the long-term viability of U.S. domestic production. U.S.
449 crude oil and lease condensate resources in non-prohibited
450 areas are estimated at 223 billion barrels in the Annual
451 Energy Outlook that we just published in December up from
452 EIA's estimate of 140 billion barrels back in the year 2000.
453 That is despite cumulative production since the year 2000 of
454 over 26 billion barrels of oil. U.S. total dry natural gas
455 resources, 2,327 trillion cubic feet in the AEO2013 are up
456 from our 2000 estimate of nearly 1,600, maybe I should say
457 only 1,600 trillion cubic feet, despite cumulative production
458 between those years of 260 trillion cubic feet. The shale
459 gas resource in the AEO2013 is about 13 percent higher than
460 what we estimated in 2012.

461 Moving on to coal, domestic production decreased
462 actually by 12 percent by over 1,000 million short tons
463 between 2008 and 2012, half of this decline between 2011 and

464 2012, as electric utilities and the industrial sector cut
465 back their purchases. EIA estimates that coal consumption in
466 electric power in 2012 will total 829 million short tons, the
467 lowest since 1992, due largely to competition from low
468 natural gas prices. Coal exports in 2012 partially offset
469 that decline in consumption.

470 The largest category of coal resources, the demonstrated
471 reserve base, which represents coal in the ground, this
472 resource base was originally estimated back in 1974 by the
473 Bureau of Mines as part of the last comprehensive assessment
474 that they made. On January 1, 2012, the resource base was
475 estimated to contain 483 billion short tons. That is a huge
476 amount. Limited resources at EIA have prevented us from
477 doing a full national assessment but we have updated some of
478 the regions.

479 Finally, I would like to highlight developments in
480 renewable resources. EIA estimates that production of
481 renewables, most renewables, grew significantly in 2012,
482 especially wind and solar. Hydropower production fell
483 because of the drought. Even so, the overall growth in
484 renewable energy consumption from 2010 to 2012 was over 10
485 percent. Drought in the Midwest caused fuel ethanol
486 production to fall by about 80,000 barrels a day in the
487 second half of 2012. We expect that production will pick

488 back up again as the drought recedes and we will get back to
489 pre-drought levels of about 870,000 barrels a day of ethanol
490 production. Biodiesel production averaged a billion gallons
491 in 2012 and it is expected to meet the RFS requirements of
492 1.28 billion gallons that have been set for 2013.

493 That concludes my testimony. Thank you again, Mr.
494 Chairman, for the opportunity to be here.

495 [The prepared statement of Mr. Sieminski follows:]

496 ***** INSERT 1 *****

|

497 Mr. {Whitfield.} Well, thank you.

498 And Dr. Yergin, you are recognized for 5 minutes.

|
499 ^STATEMENT OF DANIEL YERGIN

500 } Mr. {Yergin.} Chairman Whitfield, Ranking Member Rush,
501 members of the committee, I am pleased to be here--

502 Mr. {Whitfield.} Is your microphone on?

503 Mr. {Yergin.} I don't think so. So I will start over
504 with 5 minutes. Thank you.

505 Chairman Whitfield, Ranking Member Rush, members of the
506 committee, it is really an honor to be here to have the
507 chance to share some thinking that fits into the framework of
508 the discussion that the members have already laid out.

509 It is indeed very timely because the United States is in
510 the midst of an unconventional revolution in oil and gas that
511 fits that all-of-the-above strategy that Congressman Rush
512 talked about and also becomes increasingly apparent, goes
513 beyond energy itself, that is, it goes to the economy, and it
514 has only become really apparent in the last year or two that
515 this unconventional revolution is supporting currently about
516 1.7 million jobs in the United States and it is not only in
517 the oil- and gas-producing States. There are 44,000 jobs in
518 New York, which doesn't produce, 39,000 jobs in the State of
519 Illinois. We think that overall job number will rise to 3
520 million by 2020.

521 Last year, this unconventional revolution brought \$62
522 billion in revenues to federal and State government. By
523 2020, that number could be close to \$115 billion. It is
524 helping to stimulate a manufacturing renaissance in the
525 United States. We have noted something like \$95 billion of
526 plans for investment in the chemical sector in the United
527 States. I don't know if all of that will get done but that
528 demonstrates it. It is certainly improving the competitive
529 position of the United States in the world and beginning to
530 affect global geopolitics.

531 I think although great advances have been made in solar
532 and wind--I talk about them The Quest--the rebirth of
533 renewables, those are really innovations from the last
534 century. In terms of this century, what is happening in oil
535 and gas is the biggest energy innovation so far of the 21st
536 century. It has unfolded fast. Those of you who
537 participated in hearings in 2008 remember those dark, dire
538 days when, I think as Chairman Whitfield reminded, the world
539 was going to run out of oil and the United States was going
540 to run out of oil even more quickly. How that has changed.
541 Shale gas now has gone from 2 percent of our supply to 37
542 percent of our supply, and what is really dramatic is what
543 has happened on oil, which instead of continuing its long
544 decline has increased dramatically by almost 39 percent since

545 2008. That increase is equivalent--because you say what does
546 that mean. It is equivalent to the entire output of Nigeria,
547 the 7th largest oil-exporting country in OPEC. It is almost
548 equivalent to Iran's total exports before sanctions went into
549 place. Indeed, it is sobering to consider that without these
550 technologies, and the oil output that has resulted from them,
551 the sanctions on Iran might well have failed.

552 The environmental aspects have been touched on. U.S.
553 carbon dioxide emissions from energy consumption are down 13
554 percent since 2007. I think in discussion we might get to
555 some of the conclusions that we came to as the Deutch
556 committee, the subcommittee of the Secretary of Energy
557 Advisory Board set up at the behest of President Obama, on
558 managing the environmental issues around this. One thing
559 that did come out of that hearing is a focus on the role of
560 the States and in particular the activities of STRONGER, the
561 collaborative organization of the States that seeks
562 collaborative benchmarking and standard setting.

563 Let me come finally to something that is always
564 contentious, which is imports and exports of oil and energy,
565 which has been a major issue for the United States for about
566 70 years. Until the end of the last decade, it seemed that
567 the question was only how fast would oil imports go up and
568 how big would our imports of natural gas become, as the

569 chairman referred to in his remarks. Well, this
570 unconventional revolution has sure turned that around. Mr.
571 Rush has cited the decline in our imports over the last 7
572 years or so, and this is the result both of surging
573 production and greater efficiency. Moreover, the flow of
574 imports has changed. Canada now supplies about 27 percent of
575 our total.

576 But what gets the most attention right now is the
577 question of whether we are going to become an export of LNG,
578 liquefied natural gas, and I think this needs to be looked at
579 in terms of the overall U.S. supply and global competition.
580 Our view, similar to others, is that the market in the United
581 States is demand constrained, not supply constrained. Many
582 LNG projects have been announced. We think only a handful
583 will be built, these \$10 billion projects. The reason is
584 both cost and scale of global competition. Currently
585 already, before any of these get going, already about a
586 third, equivalent to a third of total existing capacity new
587 projects are under construction or have been committed. So
588 the United States capacity will be coming into a market in
589 which there will be new supplies from Australia, new sources
590 such as offshore East Africa and eastern Mediterranean and
591 Canada. Just yesterday, Canada approved a major export
592 project to Asia. Finally, the shale gas development that

593 will occur elsewhere, so these will all be offsets.

594 So let me just add one other thing. I think for
595 decades, the United States has made the free flow of energy
596 supplies really one of the corner principles of our foreign
597 policy. It is the policy we have urged on many other
598 nations. So to me, at least, it is puzzling how we can say
599 to a close ally like Japan suffering energy shortages as a
600 result of Fukushima that on the one hand we want you to
601 import less oil from Iran, yet on the other hand we don't
602 want to consider new natural gas exports to Japan. So those
603 are some thoughts for consideration on it.

604 I will just conclude by saying certainly expanded
605 domestic supply will add resilience to shocks and add to our
606 security cushion. Moreover, prudent expansion of U.S. energy
607 exports will actually add an additional dimension to U.S.
608 influence in the world. However, there remains only one
609 world oil market, and a disruption anywhere will be a
610 disruption everywhere.

611 So all together this unconventional oil and gas
612 revolution has already had a major impact in multiple
613 dimensions. Its significance will continue to grow as it
614 continues to unfold, and these opportunities certainly
615 provide a timely opportunity for assessing the impact and
616 significance in its many dimensions. Thank you.

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

618 ***** INSERT 2 *****

|
619 Mr. {Whitfield.} Thank you, Dr. Yergin.

620 Ms. Morgan, you are recognized for 5 minutes.

|
621 ^STATEMENT OF JENNIFER MORGAN

622 } Ms. {Morgan.} Thank you very much, Mr. Chairman, and
623 thank you for the opportunity to testify here today. I work
624 for the World Resources Institute, which is a nonprofit,
625 nonpartisan think tank, and we focus on the intersection of
626 environment and improving people's lives.

627 I am very delighted to speak here today about America's
628 abundant energy resources and the smart choices we need to
629 make to deliver them, and I have two main points to share
630 with you today. First is that an effective, durable and
631 affordable energy strategy must consider the risks of climate
632 change. Why? Well, our climate is changing. Each
633 successive decade in the last 50 years has the warmest on
634 record globally, and extreme weather events are on the rise
635 with tens of billions of dollars in damages in the United
636 States each year. A 2010 National Research Council report
637 concluded that ``climate change is occurring, is caused
638 largely by human activities and poses significant risks for,
639 and in many cases is already affecting a broad range of human
640 and natural systems.'' This is the message of numerous
641 comprehensive science assessments including the draft
642 National Climate Assessment that was released last month.

643 Directly relevant to this subcommittee are electric
644 infrastructure and reliability are already being affected and
645 are increasingly vulnerable to droughts and other disruptions
646 caused by climate change. Current impacts on energy
647 production are just the beginning. Unless we change course,
648 these impacts will become more extreme, placing our energy
649 infrastructure and our country at great risk, which brings me
650 to my second point, which I think is very important. To
651 avoid the most serious climate change impacts, our energy
652 policy must drive low-carbon technologies forward now and
653 build them out at a much larger scale.

654 The good news is that we don't have to choose between
655 energy security and climate security. America is rich in
656 renewable resources and has large opportunities to increase
657 efficiency. According to the National Renewable Energy
658 Laboratory, 80 percent of our electricity needs can be met in
659 2050 through renewable generation and existing technology.
660 We can also improve our efficiency across the economy. The
661 National Academy of Sciences found that the United States
662 could save 30 percent of the energy used, and reducing
663 methane emissions from natural gas and capturing and storing
664 CO2 can put us on the cutting edge of technology development,
665 which I think is a true win-win.

666 If the United States, however, and we decide not to move

667 forward with a low-carbon future now, we risk not only the
668 severe impacts of climate change but also stranded
669 investments from short-term poorly informed planning. Many
670 utilities are already factoring climate change into their
671 investment decisions, and they are looking for regulatory and
672 climate policy certainty. Investments in high-polluting
673 resources, I think, will prove to be a poor bet over time and
674 these investments will be at direct physical risk from
675 increasing impacts.

676 So without a rapid shift to a low-carbon economy, the
677 United States is also going to miss out on the clean
678 technology market around the world. The global market for
679 low-carbon technology could double or triple by 2020.

680 So in conclusion, Mr. Chairman, I think the United
681 States has the opportunity to be both energy and climate
682 secure in the future, and Congress can help and assist in
683 that effort through policies that first ensure climate change
684 risks are more directly incorporated into both public and
685 private decision making; two, build out America's clean
686 energy sector through an approach that is comprehensive, long
687 term, targeted and inclusive; three, increase energy
688 efficiency across the economy; and four, provide funding and
689 incentives for low-carbon and clean energy technologies.
690 Ultimately, Congress will work together to build national

691 energy policies that take these climate risks very seriously
692 and take advantage of all the opportunities presented by our
693 abundant clean energy resources.

694 Thank you very much for the opportunity, sir.

695 [The prepared statement of Ms. Morgan follows:]

696 ***** INSERT 3 *****

|
697 Mr. {Whitfield.} Thank you, Ms. Morgan.

698 Ms. Hutzler, you are recognized for 5 minutes.

|
699 ^STATEMENT OF MARY J. HUTZLER

700 } Mr. {Hutzler.} Chairman Whitfield, Ranking Member Rush
701 and members of the subcommittee, thank you for the invitation
702 to participate in today's hearing.

703 The Institute for Energy Research is a nonprofit think
704 tank that conducts research and analysis concerning global
705 energy issues. In the last several years, IER has monitored
706 closely the boom in energy production that is taking place in
707 the United States, primarily on private and State lands. IER
708 also tracks regulations and policies that limit the potential
709 to reduce our dependence on overseas oil regimes, hinder our
710 ability to generate much-needed revenues, and harm efforts to
711 foster an energy-based economic recovery that creates jobs.

712 Just this morning, we released a study on the economic
713 effect of immediately opening federal lands onshore and
714 offshore to energy production. According to our analysis,
715 immediately opening federal lands that are currently
716 unavailable because of statutory or administrative action
717 would result in an additional \$14.4 trillion to our GDP over
718 the next 37 years. In light of the recent Commerce
719 Department report, the GDP shrank for the first time since
720 2009. Our economy needs the lasting stimulus that robust

721 energy development on federal lands and waters would provide.

722 But today's hearing is focused primarily on the resource
723 availability and the potential under our feet and off our
724 shores to achieve domestic energy goals, almost unthinkable
725 just a few years ago. In fact, for decades Americans were
726 asking the question, where we will get the energy we need to
727 heat our homes, fuel our cars and meet the demands of a
728 strong 21st century economy. Due to hydraulic fracturing and
729 horizontal drilling technologies, we no longer question
730 whether we have the resources. Rather, we question whether
731 we will be able to develop them and thus reap the nationwide
732 economic benefits such development would foster.

733 The myth of energy scarcity that has plagued our
734 national conversation has been exposed. Just in the last
735 year, the misleading refrain that the United States only
736 possesses 2 percent of the world's oil reserves has been
737 replaced by the mounting evidence of our Nation's resource
738 abundance. IER highlighted this in an inventory of North
739 America's energy resources. Using government information, we
740 cataloged the vast resources of the United States and our
741 neighbors. The United States has enough resources to provide
742 reliable and affordable energy for centuries to come. The
743 question is whether the federal government will permit us to
744 access these abundant resources and not whether sufficient

745 resources exist. We can now unlock our shale resources using
746 technology proven for more than 60 years in over 1 million
747 wells without a single confirmed case of contamination.

748 Furthermore, while our use of fossil energy has
749 dramatically increased over the last 50 years, our air
750 quality has improved. According to the EPA, emissions from
751 the six criteria pollutants under the Clean Air Act have
752 decreased 68 percent since 1970, even though our energy
753 consumption has increased by 45 percent. Therefore, however
754 troubling trends in policy that threaten to restrict access
755 to our vast energy resources, which could make American-made
756 energy less available, affordable and reliable. Oil shale
757 development has all but stopped because Administration policy
758 withdrew research in much-needed leasing activity that could
759 bring these resources to market.

760 Increased oil sands imports from our neighbor Canada
761 could free the United States from energy dependence on
762 foreign countries where American workers face increasing
763 threats of kidnapping by terrorists and even murder. But we
764 need the transportation infrastructure to get it here and the
765 energy security this infrastructure would provide. Onshore
766 development on federal lands, which is roughly estimated at
767 700 million acres of subsurface mineral estate, is extremely
768 limited and is increasingly so. In fiscal year 2009, for

769 example, the current Administration leased fewer onshore
770 acres for energy development than in any preceding year on
771 record. Offshore development on 1.76 billion acres of
772 mineral lands has suffered from the de facto Administration
773 embargo with lease plans canceled, moratoria imposed and
774 cumbersome regulatory activity that served to discourage
775 exploration.

776 Today, permitting delays by federal regulators have
777 driven the wait to more than 300 days before drilling can
778 begin on federal lands, about twice as long as it took in
779 2005. By contrast, States like North Dakota are now turning
780 permits in 10 days, in Ohio, 14 days, in Colorado, 27 days.
781 Alaska's energy resources lie dormant even though its
782 pipeline has enough unused capacity to take twice the daily
783 production of North Dakota.

784 Decisions made today about access to energy resources
785 affect energy production for years and decades to come. The
786 more areas accessible to energy production today increases
787 the likelihood of domestic production tomorrow, and with it,
788 increased jobs, government revenues and economic activity.

789 Thank you for the opportunity to testify today, and I
790 look forward to your questions.

791 [The prepared statement of Ms. Hutzler follows:]

792 ***** INSERT 4 *****

|

793 Mr. {Whitfield.} Thank you, Ms. Hutzler.

794 Mr. Vidas, you are recognized for 5 minutes.

|
795 ^STATEMENT OF E. HARRY VIDAS

796 } Mr. {Vidas.} Chairman Whitfield, Ranking Member Rush
797 and members of the subcommittee, I appreciate the opportunity
798 to discuss my work in estimating the U.S. endowment of oil
799 and natural gas resources.

800 Due to technology advancements, the U.S. natural gas and
801 oil resource base is now widely seen as large and diverse.
802 Lower-48 production of shale gas, tight oil, and associated
803 natural gas liquids has been an engine of economic growth in
804 recent years. Our analysis of the remaining resource base
805 indicates that this unconventional resource base is large and
806 that this production activity is in the early stages of the
807 resource development cycle. Therefore, we expect growing
808 production and increased jobs many years into the future.

809 In recent years, ICF has extensively evaluated shale gas
810 and tight oil resources, both in terms of technical and
811 economic recovery. This work has been sponsored by private
812 companies, industry associations and government agencies. We
813 have evaluated the geology, historic production and costs of
814 all the major U.S. and Canadian geologic settings, or as we
815 say, plays. This analysis shows that these resources are
816 geographically widespread, and are economic to develop at

817 moderate wellhead prices. The ICF analysis of these emerging
818 natural gas and oil resources is done using a geographical
819 information system, a process that evaluates the resource at
820 a highly granular level, accounting for variations in
821 geology, resource quality and economics within the plays.
822 This ICF analysis reflects recent upstream technology
823 including advances in horizontal drilling and steering,
824 multistage hydraulic fracturing, improvements in fracturing
825 fluids and methods, and improvements in seismic and
826 geophysical analysis that helps identify the best locations
827 for the wells. And finally, I would point out advances that
828 reduce the environmental impacts of drilling. These are such
829 things as using multi-well drilling pads, conservation of
830 water and recycling of water resources, reformulation of
831 chemical additives, and reduced emission completions that
832 capture gases in the flow-back.

833 These upstream technology advances have enlarged the
834 U.S. economic resource base by expanding areas where drilling
835 can take place, increasing recovery factors and reducing
836 capital and operating costs per unit of production. ICF
837 estimates that the remaining technically recoverable U.S.
838 natural gas resource base is 3,850 trillion cubic feet, which
839 represents 155 years of current consumption. The U.S. shale
840 gas resource is almost 2,000 tcf, and that makes up 52

841 percent of the total. One should look at these assessments
842 as conservative in the sense that they are developed assuming
843 current technology and no major new plays are discovered.

844 In terms of U.S. oil production, as already been
845 mentioned, U.S. production started increasing in the year
846 2009 for the first time since 1984 and there is the potential
847 for the United States to become a much larger oil producer in
848 coming decades due, as we have heard, from expanded
849 production of tight oil. Our current assessment of the U.S.
850 oil resources in terms of technically recoverable resources
851 is 264 billion barrels. This represents 110 years of
852 production at current production rates.

853 The U.S. tight oil potential is excellent due to the
854 wide range of potential producing plays in diverse geologic
855 settings at numerous basins. The success in tight oil across
856 a wide spectrum of geologic settings indicates that most
857 historic oil-producing areas will eventually see horizontal
858 drilling, and in many cases, this tight oil development will
859 dominate activity and production.

860 So in summary, recent advances in drilling and
861 completion technologies have dramatically increased estimates
862 of technically recoverable natural gas and oil resources and
863 have led to a much more optimistic outlook for future oil,
864 gas and natural gas liquids production. Our forecast for

865 natural gas is that it is going to be growing at about 2.2
866 percent per year up to about 32 tcf by 2025, and our forecast
867 for the oil production is even faster 2.6 percent, up to 9
868 million barrels per day by 2025.

869 The other point I want to make is that we expect
870 upstream technologies to continue to improve and therefore we
871 expect these resource base number to be going up in the
872 future as well as the economics to improve as well. Thank
873 you.

874 [The prepared statement of Mr. Vidas follows:]

875 ***** INSERT 5 *****

|
876 Mr. {Whitfield.} Thank you, Mr. Vidas.

877 At this time we will go into the question-and-answer
878 period, and I will recognize myself for 5 minutes for
879 questions. Once again, I want to thank all of you for your
880 testimony. It is quite encouraging that we find ourselves in
881 America today with abundant natural resources--gas, oil,
882 coal--as well as renewables, and your testimony, as I had
883 indicated in my opening statement, shows how just a short
884 period of time how everyone was talking about we were
885 depleting our natural resources. So it is really exciting
886 that we find ourselves in America in this situation and
887 particularly at a time when we really are in a global
888 marketplace and we find ourselves competing with other
889 countries for jobs and for job creation. How many of you
890 attended the World Economic Forum in Davos? Dr. Yergin?
891 Okay.

892 Now, I had read some comments that there was a lot of
893 discussion in Davos about the focus on American energy
894 independence, and the articles that I read indicated it was a
895 major concern for the Europeans because fortunately in
896 America, most of our production and discoveries have occurred
897 on private lands which we have been able to develop even
898 though permits on public lands are down, and I know that in

899 Europe, a lot of these discoveries are on government-owned
900 lands. But would you make a comment about your observation
901 of the Europeans' views on what is happening in America in
902 the energy sector?

903 Mr. {Yergin.} Yes. I think it was summarized for me at
904 the World Economic Forum, I asked a prominent journalist what
905 he thought the number one theme was, and I expected him to
906 say the euro, and he said shale, and it took me by surprise,
907 but I think that, you know, it takes time for thinking to
908 catch up with changes, and I think Europe is suffering from
909 enormous unemployment problems. Spain has 26 percent
910 unemployment. And they are looking at the United States and
911 saying the United States, because of this low-cost, abundant
912 energy is going to be a very formidable competitor and people
913 kind of stopping investing Europe and wanting to transfer
914 their investment to the United States, and I think companies
915 that are European based saying that they are going to be at a
916 disadvantage competing against the United States.

917 I heard the same thing when I was in China for the
918 publication of my book *The Quest*. I spent 2 weeks there and
919 I heard the same intense discussion about shale in the sense
920 that the United States was going to be changing the
921 competitive playing field in the global economy because of
922 this, so I think the rest of the world has really kind of

923 become obsessed with this development in the United States
924 because of how it changes the competition, as I say, in the
925 global marketplace.

926 Mr. {Whitfield.} Well, I agree and I think we are very
927 fortunate to live here, and the policies that we adopt are
928 going to go a long way in determining how far we can go down
929 this road, and I said in the beginning, one of our primary
930 focuses today is about economic growth and job creation, and
931 we have what I will refer to as a magic key to really
932 facilitate that in many ways.

933 Let me just briefly talk about the export of liquefied
934 natural gas. I know it is controversial and I know there are
935 a lot of different sides to it. My understanding is that a
936 permit has been issued and there is a facility being built in
937 Louisiana for the purpose of doing that. I know the chemical
938 industry, for example, is very much opposed to it, but would
939 some of you just make a brief comment on what you think about
940 it? I mean, do you think this is something we should be
941 looking at? When you think about the impact it would have on
942 our trade deficit too, that is good. But Dr. Yergin, I know
943 you mentioned it briefly. Just give me your views on that.

944 Mr. {Yergin.} Well, I think that some of us can
945 remember a few years ago when we were going to have all these
946 importing facilities for LNG, and you would look at a map and

947 you would see 30 or 40 of them and it turned out it is sort
948 of zero right now, so I think there is a kind of boom
949 discussion about all these facilities, and our conclusion is
950 that the number that will be built is perhaps, you know, you
951 could count them on one hand because a lot of the discussion
952 has left out, as I said, the competitive factor that there
953 are a lot of other people. Canada might have three to five
954 just in British Columbia and they cost a lot, and a lot of
955 new projects. There is new gas off of East Africa. There is
956 new gas off Israel. All that is going to be coming into the
957 marketplace, so that will kind of put a balance upon it, and
958 I think as many of us feel on this panel that the issue is
959 that we are demand constrained. We have a lot of gas and so
960 it would not have a dramatic impact on gas cost and it would
961 unfold over a decade or more.

962 Mr. {Whitfield.} Did you want to make a comment, Ms.
963 Morgan?

964 Ms. {Morgan.} We haven't worked extensively on LNG
965 exports but I think the key point I think across the board
966 is, if the United States is successful in integrating carbon
967 capture and storage along with gas from shale and other
968 resources, you actually, I think, would have even greater
969 opportunities.

970 Mr. {Whitfield.} I see my time is expired so at this

971 time I will recognize the gentleman from Illinois for 5
972 minutes, Mr. Rush.

973 Mr. {Rush.} I want to thank you, Mr. Chairman.

974 Dr. Yergin, it is so good to see you again. I remember
975 having breakfast with you at the Aspen Institute and I
976 thought you did quite well and you are doing quite well now.
977 In your testimony, you report that the unconventional energy
978 revolution supports 1.7 million jobs currently and that that
979 number will grow significantly over the next decade. Can you
980 speak to these new jobs and what we can expect to see? How
981 will the number grow, the types of jobs that will be created
982 and where these jobs will be located nationally?

983 Mr. {Yergin.} We undertook this research over about the
984 last six or seven months, and we were surprised by a couple
985 of things, one, the scale of the jobs. We use the same
986 methodology that the Bureau of Economic Analysis and Commerce
987 Department uses. And secondly, that it really spread across
988 all the States. That is why I mentioned New York and
989 Illinois as examples because of these long supply chains, and
990 I think this too, if we talk about the surprise around
991 unconventional resources, the first surprise was the scale of
992 it and the speed and the second has been this wider economic
993 impact. So the jobs, that 1.7 million that we talk about
994 includes direct jobs, which would actually be working in the

995 oil and gas fields. It would include the technology jobs,
996 the service jobs that support it, and then it is the jobs
997 that are created--this is called the induced jobs that are
998 created by the rising incomes that people have to spend and
999 it is the kind of services that would be provided. So it is
1000 kind of package of all of them, and you know, it is a
1001 demonstration of how tightly integrated our national economy
1002 is, that it goes across the entire country. So it could be
1003 everything from somebody working in manufacturing steel in
1004 Ohio to somebody working in information technology in
1005 California that feeds into this industry.

1006 Mr. {Rush.} Are we equipped now? Is the American
1007 workforce prepared to take these jobs? Are we prepared to
1008 deal with these jobs?

1009 Mr. {Yergin.} I think so up to a point, but it does
1010 require training. For instance, the State of Ohio is getting
1011 prepared for activity there, and Governor Kasich there has
1012 made a big emphasis on vocational training in the schools to
1013 train workers who would be working directly in the oil or gas
1014 field, in the Utica shale, as it is called. I think it is
1015 striking that this job creation or job support has really
1016 occurred during a period of high unemployment and it has been
1017 in a sense one of the bright spots during these 5 tough
1018 economic years that we have had.

1019 Mr. {Rush.} Thank you.

1020 Ms. Morgan, in your testimony you state that the United
1021 States has been a world leader in clean energy research and
1022 development but it has had less success relative to other
1023 countries in actually developing a domestic clean energy
1024 manufacturing industry. In your opinion, what has prevented
1025 the United States from developing a robust clean energy
1026 manufacturing sector?

1027 Ms. {Morgan.} Thank you. We recently did an assessment
1028 across five countries of the wind and solar value chain to
1029 look at who is winning the clean energy race, and what we
1030 found across the board is that the countries that are ahead,
1031 which include Germany and China, have a long-term policy
1032 signal that provides certainty for investors in
1033 manufacturing. So you need to have something that goes
1034 beyond 3 years. So now with our short-term benefits, you may
1035 see some wind turbines come up but you may be creating the
1036 perverse piece where you are not creating the manufacturing
1037 capacity domestically because there is no long-term policy
1038 signal around renewable energy and therefore you may see the
1039 import of those parts because investors don't know what is
1040 going to happen in 2 years or 3 years, so it is mostly that
1041 lack of national renewable energy policy that is lacking
1042 here.

1043 Mr. {Rush.} Along the same lines, what does the United
1044 States need to do to become a net exporter of clean energy
1045 technology?

1046 Ms. {Morgan.} I think there are a number of pieces
1047 across the value chain that would be essential. The first is
1048 that national policy that provides that long-term certainty,
1049 so that could be anything from a renewable portfolio standard
1050 to a feed-in tariff to whatever policy of choice provides
1051 that long-term certainty. The second really is putting in
1052 place the innovation centers that bring together public and
1053 private actors to be able to develop those new technologies
1054 rapidly. The third is to increase our research and
1055 development. We are doing pretty there, but our problem
1056 really is that although we are leading the world in R&D, we
1057 are not doing it fast enough vis-à-vis other players. Thank
1058 you.

1059 Mr. {Rush.} Thank you very much, Mr. Chairman. You
1060 have been very kind.

1061 Mr. {Whitfield.} Thank you. At this time I recognize
1062 the gentleman from Texas, Mr. Barton, for 5 minutes.

1063 Mr. {Barton.} Thank you, Mr. Chairman.

1064 I would like to ask Mr. Yergin if he is familiar with
1065 the emerging technology on hydraulic fracturing that greatly
1066 minimizes the amount of water that is used. Have you studied

1067 that in any detail?

1068 Mr. {Yergin.} I am certainly aware of companies who are
1069 working to perhaps reduce the water requirements by as much
1070 as 75 percent, and I think, you know, one of the things when
1071 we did this study for the Secretary of Energy Advisory Board,
1072 we said that the needs here, as your question suggests, are
1073 going to really promote a lot of innovation and there sure is
1074 a lot of innovation going into the water issues right now,
1075 and we do see the water usage as a major part of it.

1076 Mr. {Barton.} There is a company in my district and
1077 then there are a number of companies around the country that
1078 they haven't commercialized it to a great degree yet but they
1079 have certainly shown that it works on a prototype basis, and
1080 some of them can take as much as 99 percent of the water that
1081 is currently used to frack a well. It is no longer
1082 necessary. And I think that if we can solve that issue
1083 satisfactorily, the sky is the limit. I think that seems to
1084 be the larger environmental issue.

1085 Mr. {Yergin.} Congressman Barton, if I can say, it is
1086 striking that this is all--you know, this is only in the last
1087 4 or 5 years and already to see this innovative response,
1088 which is part of our hearing, it kind of shows the creativity
1089 of our industries to respond to immediate needs.

1090 Mr. {Barton.} When I was chairman of the full

1091 committee, we passed a bill called the Energy Policy Act of
1092 2005, and we put in language that gave the Federal Energy
1093 Regulatory Commission ultimate say on siting LNG facilities
1094 for import. We thought we were going to be importing
1095 liquefied natural gas. That authority is now being used by
1096 the FERC to license facilities to export, in some cases the
1097 same facility. They are just turning it around. Do you see
1098 LNG for export radically changing the price structure for
1099 natural gas, which right now is a little under \$3 1,000 cubic
1100 feet?

1101 Mr. {Yergin.} No, we don't see LNG exports as having a
1102 major impact on price. I mean, what we see is a continuing
1103 growth of supply and there is actually a need for additional
1104 market, whether it is LNG, whether it is vehicles, it is
1105 electric power, and we don't think that these projects will
1106 have much impact.

1107 Mr. {Barton.} So you don't see any national security
1108 issues if we were to license LNG facilities?

1109 Mr. {Yergin.} I think we see a gain to national
1110 security from the United States being an energy exporter and
1111 the influence that will come from that that is a net positive
1112 for our national security.

1113 Mr. {Barton.} I happen to agree with that.

1114 And finally, I have got about another minute and a half,

1115 Dr. Yergin, how do you see the combination of hydraulic
1116 fracturing and horizontal drilling in terms of oil
1117 production? A lot of companies down in Texas 5 or 6 years
1118 ago when I talked to them about using this technology for oil
1119 production, they kind of laughed. They said it is just not
1120 the same, it doesn't work. And a company in Houston, EOG,
1121 and also a privately owned company, Hunt Energy up in Dallas,
1122 they decided to try it, and I will be darned, all you have to
1123 do is look at the Bakken up in North Dakota, and I think
1124 almost all of that production is horizontally drilled with
1125 hydraulic fracturing. Do you see that becoming the norm or
1126 do you still see the conventional drilling for oil
1127 dominating?

1128 Mr. {Yergin.} I think it is really spreading. I mean,
1129 as you say, it was only around--this is only really is 2009,
1130 2010 that it took off for oil, and I think the numbers keep--
1131 I don't know what Administrator Sieminski would say but the
1132 numbers keeping exceeding the projections that are happening
1133 so fast and we see it being applied in traditional areas like
1134 the Permian Basin, which has been pronounced dead several
1135 times and of course is going through another--

1136 Mr. {Barton.} They had an all-time year last year.

1137 Mr. {Yergin.} Yes, so I think it is going to be
1138 applied, and I think that we will see probably impact of this

1139 faster globally than we will see it in terms of natural gas.

1140 Mr. {Barton.} My final question is to Mr. Sieminski.

1141 Do you see the United States being self-sufficient in oil

1142 production in the next 10 years?

1143 Mr. {Sieminski.} In oil production?

1144 Mr. {Barton.} Yes.

1145 Mr. {Sieminski.} In our reference case for the Annual

1146 Energy Outlook, which we just published, we have oil self-

1147 sufficiency getting down to the low 30s, low 30 percent, so

1148 30 percent of our consumption would still be imported. In

1149 the side cases, which we will run and publish in March, so

1150 the complete set of side cases for the Annual Energy Outlook,

1151 we have looked at what it would take to get to self-

1152 sufficiency in oil, and it involves closer well spacing,

1153 greater estimates of what the resource base is and a number

1154 of other factors that would drive oil production higher. We

1155 also looked at the demand side; that is, could fuel

1156 efficiency standards for automobiles, for example, be

1157 improved, and other steps that could be taken to reduce

1158 demand. In that set of circumstances, which requires further

1159 policy changes on both supply and demand, we could get to a

1160 crossover where the United States would be self-sufficient.

1161 Mr. {Barton.} You are not saying it is probable but it

1162 is possible?

1163 Mr. {Sieminski.} It is possible.

1164 Mr. {Whitfield.} The gentleman's time is expired.

1165 Mr. {Barton.} Thank you, Mr. Chairman.

1166 Mr. {Whitfield.} At this time I recognize the gentleman
1167 from Texas, Mr. Green, for 5 minutes.

1168 Mr. {Green.} Thank you, Mr. Chairman. I am proud to
1169 follow my colleague in Texas, on the success we have had on
1170 directional drilling in both natural gas and oil. You might
1171 remember, you were chair of the committee, Congressman
1172 Barton, in 2005 when we did a bipartisan energy bill that we
1173 put in a little provision for the DOE to do a study on
1174 directional drilling because they had a great lab in Wyoming
1175 to do it, and we had a Houston or a Texas company who was
1176 drilling at that time out to 35,000 feet and they thought
1177 they could get to 50,000 and on, and we are seeing some of
1178 the success of that both for natural gas but also for the
1179 tight oil, as we call it.

1180 I have always believed a balanced energy policy must
1181 support all domestic sources of energy including oil, natural
1182 gas and renewables, and again, the last question was, we are
1183 also using our energy smarter now because each time I buy a
1184 new car, I am getting 5 to 10 miles more per gallon than I
1185 did on the previous one, so we are using our energy smarter.
1186 Limiting this production would only serve to jeopardize our

1187 small-business jobs and increase our reliance on foreign
1188 sources of energy. It may also have an impact on our ability
1189 to address climate change because if we fail to provide the
1190 natural gas needed to meet our short-term carbon reduction
1191 targets while providing affordable and reliable sources to
1192 American consumers.

1193 Administrator Sieminski, the EIA expects natural gas
1194 production to remain close to its 2012 level in both 2013 and
1195 2014. Is that correct?

1196 Mr. {Sieminski.} Yes.

1197 Mr. {Green.} I know currently there are a lot of wells
1198 comprised of just gas, or just dry gas, that are not being
1199 produced due to the low price of natural gas. This is one of
1200 the reasons I support the export of LNG so that there is
1201 additional incentive to produce these gas wells. Has EIA
1202 looked at what these export opportunities might mean for our
1203 future natural gas production levels?

1204 Mr. {Sieminski.} We have done that. Coming back to the
1205 point of what is the major driver behind why we have natural
1206 gas holding even this year and next year, it is mainly
1207 because we are assuming natural gas prices are going to
1208 recover up towards \$4 by the end of next year. That begins
1209 to allow coal to compete more effectively for electric
1210 utility generation markets and holds natural gas back. So

1211 one of the interesting factors here that comes into play is
1212 that if because of continuing strong supplies, natural gas
1213 prices remain low. That would actually lead to more demand
1214 in the electric utility sector.

1215 As far as LNG is concerned, and in response to the
1216 question that Chairman Whitfield asked at the beginning of
1217 the hearing, Mr. Green, the United States is already
1218 exporting natural gas. We export by pipeline to Mexico and
1219 Canada. Of course, we get more gas from Canada. In the
1220 reference case that we examined for the Annual Energy
1221 Outlook, EIA has LNG exports from the lower 48 States and
1222 Alaska rising towards about 5 percent of domestic output over
1223 the period out to 2040.

1224 Mr. {Green.} Well, I actually have two issues, I guess,
1225 on that. One, I represent an area that is heavy in the
1226 chemical industry who is concerned about the rise in natural
1227 gas prices but I also know that when I drive through south
1228 Texas and I see so much flaring of the dry gas because we
1229 don't have the capacity or the infrastructure or the
1230 customers for it, it is just such a waste of our utilization
1231 of natural gas, and so if we could sell it to someone for \$15
1232 an mcf, I wouldn't mind doing that.

1233 But has the EIA incorporated the increased use of
1234 enhanced oil recovery in its oil projections? In Texas, for

1235 example, the use of EOR has changed our predicted production
1236 levels, and you mentioned the Permian Basin area as a good
1237 example of that.

1238 Mr. {Sieminski.} We have built in some assumptions
1239 along those lines, and in separate cases, we look at other
1240 factors that could help drive oil production. One of the
1241 main questions raised at this hearing is, what is the extent
1242 of the resource base, and if we were to see the same
1243 improvements that have taken place in the last 5 years in
1244 natural gas occurring in the oil shale area, what we would
1245 end up saying is that rather than our roughly 6.4 million
1246 barrels of oil production we had last year getting up to
1247 about 8 before it begins to taper off, then it could get up
1248 closer to 10 million barrels a day and then hold pretty
1249 steady at that level, and one of those things includes better
1250 technology and recovery.

1251 Mr. {Green.} Well, and 10 million barrels a day sounds
1252 like a lot, but I actually have five refineries in East
1253 Houston and Harris County that use over a million barrels a
1254 day right now to make refined product, so we still are going
1255 to have to import or produce the needs for our own country.

1256 Mr. {Whitfield.} The gentleman's time is expired.

1257 Mr. {Green.} Thank you, Mr. Chairman.

1258 Mr. {Whitfield.} At this time I recognize the vice

1259 chair, Mr. Scalise, for 5 minutes.

1260 Mr. {Scalise.} Thank you, Mr. Chairman. I appreciate
1261 you having this hearing on America's energy security, and
1262 specifically to look at an assessment of our resources
1263 because, you know, I think the chairman had mentioned, the
1264 first natural gas facility, the first LNG export facility is
1265 in south Louisiana. I have actually toured that facility,
1266 Cheniere Energy, in south Louisiana, and that was originally
1267 built to be an import facility because we didn't think we had
1268 the reserves that we needed for natural gas, and then
1269 eventually because of the technology, the advancements that
1270 brought all these shale plays online, now the actual opposite
1271 has happened where we have so much that in many cases they
1272 are not even drilling in areas where they have leases because
1273 all of a sudden we found these resources that we didn't
1274 really know we could access just a few years ago and so they
1275 spent billions of dollars to retrofit and shift that from an
1276 import facility to an export facility, allowing us to create
1277 more American jobs and to continue to advance that new
1278 technology, which has really helped start a revolution, as I
1279 think a number of you talked about in your testimony.

1280 I want to ask you, Ms. Hutzler, because you specifically
1281 mentioned production on federal lands versus non-federal
1282 lands, and it is one of the misnomers that we hear about up

1283 here in Washington, you know, and the President will go
1284 around saying that production has never been higher, and yet
1285 you actually look at some of his policies that have shut
1286 production off on federal lands in the areas where the
1287 federal government doesn't currently have the ability to go
1288 and have an impact in those States where they are seeing a
1289 real revolution, it is on non-federal lands. So if you can
1290 touch a little bit on that, about maybe some of the factors
1291 behind such an increase on non-federal lands where you
1292 actually have some problems and in some cases reductions on
1293 federal lands on production.

1294 Ms. {Hutzler.} Production, for instance, production of
1295 oil on private and state lands over the past 5 years has
1296 increased, is essentially 96 percent of the total production
1297 that we have gotten, and the reason generally is that there
1298 is a lot of red tape when you try to deal with production on
1299 federal lands, and I think I mentioned in my opening remarks
1300 and in my testimony that it takes over 300 days to now get a
1301 permit to drill on federal lands where in the States it is
1302 less than 30 days. So all of this is taking much longer for
1303 a company to invest their money in terms of trying to deal
1304 with production on federal lands.

1305 Mr. {Scalise.} Yes, and we can see, especially if you
1306 look at the shale natural gas plays, they are actually

1307 regulated. You know, the EPA might try to give the
1308 impression that there are no federal regulations and they
1309 need to step in, and I think that concerns a lot of people
1310 because the EPA doesn't have a good track record of
1311 implementing good regulations where States have actually done
1312 a really good job at regulating natural gas shale plays, and
1313 frankly, the topography in Louisiana is a whole lot different
1314 than it is in Pennsylvania or North Dakota or Texas, and so
1315 the States have the ability to do that much better and have a
1316 great track record, by the way, of doing that, and so I think
1317 it is a good point to make because where we have seen real
1318 growth not only in energy but in jobs where in North Dakota,
1319 the lowest unemployment in the Nation they have up there
1320 because of all of this new economic growth coming from this
1321 technology, and so we surely don't want to see the federal
1322 government come in and try to slow that down in the name of
1323 good regulations when in fact you already have good
1324 regulations the way it is supposed to be done and that is
1325 where the States themselves do it.

1326 I want to ask you, Mr. Vidas, because you have looked at
1327 some of the data. We get data from the Energy Information
1328 Agency and they have even shown that there has been a
1329 decrease in production on federal lands but some of the
1330 information you have on resources, on the known resources,

1331 are dramatically higher, I think 50 percent in some cases
1332 higher than the numbers that come out of EIA. Can you
1333 explain what data you look at that shows the outlook for this
1334 country is even better than what we get from the EIA's
1335 numbers?

1336 Mr. {Vidas.} Well, in any type of resource assessment,
1337 there is going to be uncertainty because what we are talking
1338 about is some activity that has yet to happen, so we are
1339 predicting then the productivity of potentially hundreds of
1340 thousands of wells that will be drilled in the future, and
1341 the way we do it is to first start with the geology and to
1342 develop maps of each of the plays, and we try to deal with
1343 and get data on the key parameters like what is called the
1344 structure maps, which is the drilling depth you need to go
1345 down to, the thickness of the shale, some of the parameters
1346 of the shale in terms of their carbon content, the porosity,
1347 the pressures and temperatures, and from that we can develop
1348 what is called a gas-in-place estimate, which is an estimate
1349 of how much gas there is in the ground in the formations that
1350 will be targeted. And then we have information on wells that
1351 have already been drilled and we can look at their production
1352 profiles and estimate over their lives how much gas they are
1353 going to produce. So, for example, if we looked at
1354 Pennsylvania and we looked at the Marcellus shale, we would

1355 see that the horizontal wells there that have been drilled
1356 have been improving in terms of their productivity and now
1357 are producing about 4-1/2 billion cubic feet per well. But
1358 that is in the better parts of the play because producers
1359 have gone to look for the best gas first, the most economic
1360 gas, but then we can look at the other areas of the play in
1361 terms of either being thinner or less pressure or lower
1362 porosity and we can correct for the productivity using basic
1363 engineering principles and thereby forecast that into the
1364 future, the future productivity of the wells, which we think
1365 on average will be about half of that, maybe 2 bcf per well.

1366 Mr. {Scalise.} I am seeing I am out of time. I
1367 apologize, but I thank you for your testimony and your
1368 answers, and Mr. Chairman, I yield back.

1369 Mr. {Whitfield.} At this time I will recognize the
1370 gentlelady from California, Ms. Capps, for 5 minutes.

1371 Mrs. {Capps.} Thank you, Mr. Chairman, very much, and
1372 thank you, each of you, for your testimony.

1373 You know, assessing our current energy resources is
1374 obviously important, especially in light of the numerous
1375 advancements in research and technology in recent years and
1376 that is why I appreciate today's hearing, but I am concerned
1377 that we are not getting the full picture. Today's testimony
1378 and the questions coming from the majority have focused

1379 overwhelmingly on fossil fuels. Oil, natural gas and coal
1380 obviously dominate our energy supply but they are certainly
1381 not the only resources available. The EIA Energy Outlooks
1382 makes this clear, pointing out that renewable energy sources
1383 such as solar, wind and biofuels make up a sizable portion of
1384 our energy use.

1385 So my first question is to you, Administrator Sieminski.
1386 EIA projects that use of renewables will continue to grow, in
1387 some cases by double digits. Is that right?

1388 Mr. {Sieminski.} Yes, that is correct. We actually
1389 have renewables growing the fastest in percentage terms of
1390 all of the fuel sources over the period out to 2040. I would
1391 also like to point out that the share of generation of
1392 electricity from renewables grew about 13 percent in 2001,
1393 should grow at about 16 percent annually out to 2040.
1394 Electricity generation from solar and to a lesser extent wind
1395 energy sources grows as recent cost declines make them more
1396 economical. The 2013 projection is a little bit less
1397 optimistic about advanced biofuels because of the difficulty
1398 that companies have had in gearing up their manufacturing
1399 process but in general renewables are growing pretty strongly
1400 and help the fact that overall carbon dioxide emissions from
1401 energy in our forecast actually remain the peak that we
1402 reached of 6 billion metric tons that we hit in 2005, so it

1403 stays below that level the entire forecast period.

1404 Mrs. {Capps.} Thank you. And in addition to what you
1405 just said, Ms. Morgan, you established a direct link between
1406 burning fossil fuels and climate change, and that has already
1407 been well established from a variety of sources, and we have
1408 begun to see these impacts if we just even look at extreme
1409 weather events like Hurricane Sandy, all the droughts and the
1410 wildfires as well, and I represent a coastal State and a
1411 costal district. I am particularly mindful of climate change
1412 impacts on higher sea levels and increasing erosion.

1413 Ms. Morgan, in your testimony you discuss some of these
1414 impacts. Could you elaborate, particularly on sea-level rise
1415 and increased erosion for those of us who do represent
1416 coastal communities?

1417 Ms. {Morgan.} Certainly, yes. Sea-level rise is one of
1418 the major threats to the United States and is already
1419 occurring along the Eastern seaboard and certainly also on
1420 the West Coast. I am familiar, we have done some work
1421 looking in Florida particularly where you see that Miami
1422 Beach is already having to spend more than \$200 million to
1423 overhaul its storm damage system. You are seeing that
1424 Hallandale Beach has to spend \$10 million a year on new wells
1425 because of saltwater intrusion. Florida is built on
1426 limestone, which means sea walls don't help much. So that is

1427 a major piece of worry. Also, certainly, the energy
1428 infrastructure that is located along the coast is also at
1429 risk.

1430 Mrs. {Capps.} I just want to add an example to that. I
1431 represent the central coast of California, and the city of
1432 Pismo Beach is installing sea walls itself to protect two
1433 sewage lift stations that are threatened by erosion, and in
1434 Santa Barbara, our central creek that comes right down
1435 through the heart of the city has been widened to increase
1436 its flood capacity. These projects come at a high cost, and
1437 I know these communities have struggled to find necessary
1438 resources.

1439 One final one, in the last few seconds, is this
1440 something other communities are also struggling with and
1441 finding that the cost is really prohibitive?

1442 Ms. {Morgan.} Absolutely, and I know in Florida there
1443 are four counties that have joined together and are facing
1444 tremendous cost. If you look here in Lewes, Delaware, not
1445 far away from communities that are struggling with it, go up
1446 to Maine. So it is a real issue that we need to face on our
1447 infrastructure investments but also the cost to local
1448 communities. It puts an imperative on emission reductions as
1449 well.

1450 Mrs. {Capps.} Thank you very much. I will yield back.

1451 Mr. {Whitfield.} At this time I recognize the gentleman
1452 from Nebraska, Mr. Terry, for 5 minutes.

1453 Mr. {Terry.} Thank you, Mr. Chairman.

1454 This fall I hosted a natural gas forum in Omaha where we
1455 had representatives from just about every facet of the
1456 natural gas world from users, producers and potential future
1457 users. One theme came from that, and that is that we have a
1458 great supply of natural gas, we can argue 100 years or 150
1459 years, that there is enough supply that we could expand the
1460 uses of natural gas into transportation, and this begs of
1461 question, we have been talking about exporting surplus but we
1462 could also have discussions of additional uses of natural
1463 gas.

1464 But one thing always came back, and that is the
1465 uncertainty of regulations and the regulations when you
1466 drilled further down were defined as uncertainty about
1467 whether the federal government was going to start regulating
1468 fracking, if and how, and that that in itself is the worry
1469 for the users. I am one of those that feels that expanding
1470 natural gas into vehicles will help our country not only
1471 because we are using a domestic product but the fact that
1472 diversity in auto fuels, whether we start with trucks, heavy
1473 trucks or whatever, enhances our national security status.

1474 So starting with Mr. Sieminski, honorable, and then

1475 going down, this is the question I would like to have your
1476 respective opinions, and that is, is it fair to say that
1477 moving more of our transportation to natural gas will impact
1478 our national security?

1479 Mr. {Sieminski.} Thank you, Mr. Congressman, for
1480 calling me honorable. I guess I get that because the Senate
1481 confirmed me in my appointment. I tell people that a lot of
1482 folks in my new place of employment call me sir, and that is
1483 very different than when I was in the private sector, but I
1484 have to fly economy when I travel.

1485 Mr. {Terry.} I understand that. With a 9 percent
1486 approval rating here, we get called a lot of things, but
1487 honorable is not one of them.

1488 Mr. {Sieminski.} I think that you are on to a really
1489 interesting question here. We actually took a look at how
1490 quickly natural gas could grow in transportation, and it is a
1491 very small number, a rounding error in terms of percentages.
1492 We do use 3 percent of our natural gas to move natural gas in
1493 the pipelines, but when most people think about
1494 transportation, they are thinking about trucks or cars and so
1495 on. We believe that LNG in freight trucks and then
1496 eventually natural gas being turned into liquids like a high-
1497 quality diesel fuel--there is a plant under consideration
1498 down in Louisiana to do just that--could actually almost

1499 double the amount of total natural gas in transportation so
1500 that we could get up from 3 percent now to easily 6 percent
1501 and possibly as high as 8 or 9 percent. A lot of that is
1502 because natural gas prices from a pricing standpoint look
1503 really, really attractive compared to global oil prices. So
1504 there is a lot of effort underway there.

1505 Mr. {Yergin.} I think we have pretty much the same view
1506 as EIA, that, you know, it does now appear that natural gas
1507 will become an important fuel for large trucks, for railroads
1508 and so forth. At this point we don't see it becoming a major
1509 fuel for private automobiles because of the nature of the
1510 infrastructure and so forth that would be needed.

1511 Mr. {Terry.} I would like to hear your opinion.

1512 Ms. {Morgan.} I would be happy to.

1513 Mr. {Terry.} You are the contrarian.

1514 Ms. {Morgan.} We haven't done extensive research on
1515 this area but the one piece that I can add to the discussion
1516 perhaps is that it is clear that gas a lower global warming
1517 potential than oil, so from that perspective, it is more
1518 beneficial, and I think as I was saying earlier, if we can
1519 also tackle the carbon capture and storage piece of that, you
1520 will see even greater benefit.

1521 Mr. {Terry.} Thank you.

1522 Ms. {Hutzler.} From our standpoint, we essentially

1523 agree with Dr. Yergin in the sense that there is certainly a
1524 market in the heavy-truck area, and it is easier to deal with
1525 the infrastructure problems there of supplying the natural
1526 gas but in the private sector for residential vehicles, it is
1527 more difficult.

1528 Mr. {Vidas.} The analysis that we have done is very
1529 similar, that although we expect natural gas and liquefied
1530 natural gas vehicles to triple their use over the next 20 or
1531 25 years, it still represents a relatively small part of the
1532 overall sector. The more likely way that natural gas could
1533 be used to displace oil would be through gas-to-liquids
1534 technologies or even using natural gas to generate
1535 electricity and then using electricity in battery cars.

1536 Mr. {Whitfield.} The gentleman's time is expired.

1537 Mr. {Terry.} Thank you.

1538 Mr. {Whitfield.} At this time I recognize the
1539 gentlelady from California, Ms. Matsui, for 5 minutes.

1540 Ms. {Matsui.} Thank you, Mr. Chairman. I would like to
1541 also thank the witnesses for being with us today. I am
1542 pleased to be back on the Energy and Power Subcommittee this
1543 Congress, and I look forward to working with my colleagues to
1544 comprehensively address our Nation's energy needs, and that
1545 also includes dealing with climate change.

1546 Right now there are thousands of clean technology

1547 companies manufacturing innovative products that will help
1548 fundamentally shift our country away from carbon-intensive
1549 energy sources. Many of these are small-business owners and
1550 entrepreneurs. My district of Sacramento has over 220 such
1551 companies. I have seen firsthand the progress they have made
1552 in solar, wind, hydrogen fuel cells and waste-to-energy
1553 conversion techniques. These companies are working on
1554 cutting-edge technology to ensure that America remains a
1555 leader in green energy global market. We are rapidly losing
1556 ground in this sector to countries like China and Germany who
1557 are heavily investing in the renewable energy markets, and
1558 the United States must level the playing field to allow our
1559 clean technology companies to better compete. Low-carbon
1560 energy sources must have a seat at this table. Energy
1561 efficiency must have a seat at this table, and clean energy
1562 technology must have a seat at this time. Anything less is
1563 shortsighted and detrimental to our economy, our environment
1564 and our energy goals.

1565 I want to follow up Ranking Member Rush's questions
1566 regarding the clean energy manufacturing sector. Last month,
1567 Chairman Emeritus John Dingell and I introduced H.R. 400,
1568 which is a bill to promote American clean energy exports and
1569 increase clean energy manufacturing. This bill passed the
1570 House with bipartisan support during the 111th Congress and

1571 it is my hope that this committee will consider it soon.

1572 Ms. Morgan, can you expand on the economic benefits we
1573 would receive by boosting our clean energy manufacturing
1574 sector?

1575 Ms. {Morgan.} Certainly. I think one key piece, if we
1576 are able and hopefully will build out our manufacturing
1577 sector would be in the area of jobs. Currently, according to
1578 the Energy and Environment Study Institute, you have more
1579 jobs created in clean energy than you do in oil, fossil and
1580 coal combined, and a recent study by the University of
1581 California actually looked at the fact that you can--over
1582 time if you were to really go for 30 percent renewables and
1583 push your energy efficiency in the economy, you could have 4
1584 million jobs by 2030. So the job benefits are certainly
1585 significant, that is for sure.

1586 Ms. {Matsui.} Okay. And in your testimony, one of your
1587 recommendations is that we must build out America's renewable
1588 energy sector. Now, what are some criteria that policymakers
1589 should consider for driving clean energy growth and
1590 competitiveness?

1591 Ms. {Morgan.} I think the main criteria right now, if I
1592 look at where the United States stands on clean energy, is
1593 the clear, long-term, long, loud and legal signal that
1594 investors are looking for to see that this is a growing area,

1595 so that means that national renewable energy policy, I think
1596 it can take many different forms but optimally one that goes
1597 beyond 3 years. I think certainly having grid access for
1598 that renewable energy is another key criteria that I would
1599 look for, and I would add in training. I think the other
1600 piece that is very important, Colorado is doing some work on
1601 this, and that is happening in Germany, is a really specific
1602 training program, big job opportunities.

1603 Ms. {Matsui.} Okay. And do you think we need to
1604 consider creative financing options for smaller clean energy
1605 companies to succeed?

1606 Ms. {Morgan.} Definitely. I mean, I think that if you
1607 look at--there is a number of different innovative ways that
1608 you can bundle the demand for renewable energy and create new
1609 financing mechanisms to do that. We have had some experience
1610 with that in the United States and we are now seeing that
1611 happening in India as well.

1612 Ms. {Matsui.} Thank you. And I also believe too as we
1613 look forward, we are not--because of my focus on clean
1614 energy, clean energy technology, it does not at all mean that
1615 we cannot look at the transitional aspects of things like
1616 natural gas as long as I believe we look at some of the areas
1617 of carbon capture and storage which I think needs to be
1618 looked at alongside the wonderful aspects of how much gas we

1619 have. So anyway, I really appreciate your testimony and I
1620 hope that we can continue the conversation and looking at
1621 somewhat all of the above as we move forward.

1622 Thank you very much. I yield back my time.

1623 Mr. {Whitfield.} Thank you. At this time I recognize
1624 the gentleman from Illinois, Mr. Shimkus, for 5 minutes.

1625 Mr. {Shimkus.} Thank you, Mr. Chairman, and I thank the
1626 panel for coming to Mr. Sieminski and Dr. Yergin and actually
1627 Hutzler, and I can't see the name and we don't have paper
1628 anymore, so--Vidas. I had to go flip back on the side pad to
1629 find the testimony a couple times.

1630 Because in your presentations, a lot of you have the
1631 maps and the various plays, whether it be the shale, tight
1632 oil, coalbed, others in your testimony. What I would like to
1633 know is, how far behind are we from the pipeline
1634 infrastructure to move this product? I mean, the pipeline
1635 issue, we are dealing with Keystone and Keystone XL, part of
1636 the North Dakota play, the problem is, we don't have access
1637 to a pipeline so a lot of this North Dakota oil is being
1638 inefficiently trucked down versus through pipelines. So can
1639 you all just briefly talk about pipeline infrastructure?

1640 Mr. {Sieminski.} Thank you, Mr. Shimkus. So just to
1641 start, the infrastructure issues take time. I mean, you can
1642 often get some production going and you get a lot of wells

1643 being drilled. Whether or not companies can then afford to
1644 build the pipeline infrastructure to move those products, oil
1645 and gas, around depends on their own view about how long the
1646 production activity will last.

1647 Mr. {Shimkus.} Yes, and if you would just a little
1648 brief, because most of the pipeline infrastructure now is
1649 based upon traditional oil and gas and refineries and the
1650 like, so all these new plays are in areas where there may not
1651 be access to.

1652 Mr. {Sieminski.} Exactly.

1653 Mr. {Shimkus.} I guess the point is, is that something
1654 we ought to consider in public policy debates? Dr. Yergin?

1655 Mr. {Yergin.} Yes, I absolutely think so. I mean, it
1656 is like I said, our thinking needs to catch up with reality.
1657 Our logistics need to catch up with new production.
1658 Everything has been turned upside down. Instead of going
1659 south-north, it is going north-south. A big question, you
1660 know, we just managed to survive, save those refineries on
1661 the East Coast, but they have to be hooked into North Dakota.
1662 We see, as you say, trucking, we see railroad cars.
1663 Ultimately, the most efficient way to move these supplies is
1664 by pipeline. Canada's output of oil sands is equivalent to
1665 Libya's before the revolution there. That supply--you know,
1666 we talk about U.S. energy independence. It is really a North

1667 American integration. So we have got to get, you know, a
1668 pipeline system that catches up with the fact that technology
1669 has changed.

1670 Mr. {Shimkus.} There is also some oil being barged down
1671 on the Mississippi, and there was a recent one that ran into
1672 the bridge down in the southern part of the Lower Miss, so, I
1673 mean, there is also issues with that type of transportation.

1674 Ms. Hutzler?

1675 Ms. {Hutzler.} Yes, I agree with Dr. Yergin. We do
1676 have oil that is landlocked in North Dakota. We have built
1677 up in our storage facilities in Cushing and it is more
1678 efficient to move by pipeline. We are moving by rail now, I
1679 think I saw a number of 800,000 barrels a day, which is
1680 pretty substantial, and it is also safer to move it by rail--
1681 I mean by pipeline than rail.

1682 Mr. {Shimkus.} Mr. Vidas?

1683 Mr. {Vidas.} I agree with the other speakers, that oil
1684 and natural gas infrastructure that is going to be needed to
1685 move this oil and gas to market is very important and it
1686 involves a substantial investment each year and thousands of
1687 miles of pipe. The other point that I would emphasize as
1688 well is that pipelines in general tend to be the least
1689 expensive and usually the safest way to transport both gas
1690 and oil.

1691 Mr. {Shimkus.} Thank you. And I will finish with Dr.
1692 Yergin. This whole debate on slowing down or not exporting
1693 natural gas I find pretty problematic as natural gas is just
1694 a basic commodity product just like corn or beans or pork or
1695 anything else, and that it has to be priced on the world
1696 market and we have to get it. You mentioned in your comment
1697 that there is a need for additional markets. Why did you say
1698 that and what do you mean by that?

1699 Mr. {Yergin.} Well, because we have seen as been
1700 described my colleagues on this panel this growth, this
1701 technology has opened up a huge amount of new supply and
1702 right now, you know, there is a lot of supply that can't get
1703 to market and you see activity going down.

1704 Mr. {Shimkus.} So if there is no price signal, then all
1705 these jobs for location discovery and recovery would be gone
1706 because there is no price signal to continue the--

1707 Mr. {Yergin.} Yes. What has happened is of course a
1708 lot of it has flipped into looking for either oil or for gas
1709 that is rich with liquids but nevertheless I think the
1710 general view is that at this low level that this is not a
1711 sustaining price to maintain the growth in supply that we
1712 need for electric power, that we need for our industry and
1713 might need for transportation and to meet global markets.

1714 Mr. {Shimkus.} Great. Thank you very much. Thank you,

1715 Mr. Chairman.

1716 Mr. {Whitfield.} At this time I will recognize the
1717 gentlelady from the Virgin Islands, Ms. Christensen, for 5
1718 minutes.

1719 Dr. {Christensen.} Thank you, Mr. Chairman, and I want
1720 to thank you and the ranking member for this hearing as well.

1721 Mr. Sieminski, I represent our U.S. territory, the U.S.
1722 Virgin Islands, and they are plagued with the highest rates
1723 of electricity in the United States. In my district of the
1724 U.S. Virgin Islands, current electricity rates are five times
1725 the national average. An average family pays, if they can,
1726 5.8 cents per kilowatt compared to the 9.83 U.S. average. A
1727 visit to your website shows a very clear breakdown of State
1728 electricity profiles with the U.S. average retail price
1729 reported but in order to find information about the
1730 territories, you have to really search and it is quite
1731 confusing. The majority of information is on a beta site
1732 that is there, it says, for public testing and comment only
1733 and there is a country analysis brief on the Virgin Islands,
1734 but this is really unacceptable. So why is it that the
1735 territories' electricity cost information is not included
1736 there even if it is as an outlier and what can we do to have
1737 that information included?

1738 Mr. {Sieminski.} Thank you, Congresswoman Christensen.

1739 I said at my confirmation hearings that EIA needed to get its
1740 data better, faster and cheaper, and we are working on that.
1741 We need to receive complete and timely data from everybody.
1742 This has been a problem with some of the territories but I
1743 will look into that question and I will see what we can do.

1744 Dr. {Christensen.} And we can work to try to make sure
1745 that you have the information. It is important for that
1746 information to be out there. Thank you.

1747 We have spent a lot of time talking today about oil and
1748 gas resources but the United States has been said by Ms.
1749 Morgan and others that we are blessed with ample renewable
1750 energy resources as well. The question is whether we and the
1751 rest of the world are doing enough quickly to develop those
1752 clean energy resources and make our economies more energy
1753 efficient. Last November, the IEA released their World
1754 Energy Outlook for 2012 and found that our current energy
1755 system is unsustainable and they projected that in a little
1756 more than 20 years we could see average global temperatures
1757 increase up to 6.5 degrees Fahrenheit as approximately 80
1758 percent of future global emissions are already locked in by
1759 existing infrastructure.

1760 Ms. Morgan, how much would we have to reduce fossil fuel
1761 use in order to prevent more than, I think that would be 2
1762 degrees Centigrade rise in temperature and what does it mean

1763 that we would be locked into these emissions?

1764 Ms. {Morgan.} Thank you. Well, on the longer term what
1765 the scientific estimates state is that we need to be reducing
1766 our emissions by 80 to 95 percent by 2050, which means that
1767 we have to really have the longer term in mind. The
1768 estimates for 2020 time period for developed countries tends
1769 to be around a 25 to 40 percent reduction. The United States
1770 has made a commitment to 17 percent. I think the thing to
1771 recognize is that there are points of no return where we hit
1772 tipping points where you are no longer able to restore coral
1773 reefs, where the arctic ice melts completely. Those are the
1774 types of irreversible impacts and the lock-in of our
1775 infrastructure that, you know, comes from the current pathway
1776 on high carbon is very much responsible for that.

1777 Dr. {Christensen.} And, you know, they also say that it
1778 is possible to prevent that 2-degree Centigrade increase if
1779 we were to act to reduce CO2 emissions prior to 2017. So I
1780 don't know if you wanted to comment or Mr. Sieminski wanted
1781 to comment on what is it that--you know, the window we have
1782 is rapidly closing. It hasn't closed yet. But the IEA has
1783 said that it is ambitious but still possible. So what is it
1784 that we would have to do? What kind of technology should be
1785 included in this rapid development in climate policy if we
1786 could reduce that increase, in order to reduce that increase

1787 by 2017?

1788 Ms. {Morgan.} I will answer quickly. I think the key
1789 points are, we have to have a revolution in the renewable
1790 energy space and energy efficiency. We have these
1791 technologies now. We need to put in place the policy
1792 frameworks and the R&D to get those going. We need to price
1793 carbon. Most other major economies around the world price
1794 carbon. It drives efficiency. And we need very much to
1795 drive R&D much more quickly.

1796 Dr. {Christensen.} It is only 5 years.

1797 Mr. {Sieminski.} I won't make any policy
1798 recommendations but I would like to point out that this is a
1799 global issue so to deal with the 2-degree Centigrade we need
1800 cooperation around the world. EIA's forecasts show that
1801 almost all of the growth in carbon dioxide emissions from
1802 energy will be taking place in the non-OECD countries so
1803 outside of the developed world what we really need is to help
1804 countries like China and India move towards lower-carbon
1805 fuels.

1806 Mr. {Yergin.} I think one of the things just to add is,
1807 our CO2 emissions from energy consumption are down 13 percent
1808 since 2007, so this is already actually happening. And the
1809 other thing that we can do that has a huge impact is simply
1810 become more energy efficient. We are twice as energy

1811 efficient as a Nation than we were a few decades ago. We
1812 have technologies and tools to do that today and that is a
1813 big thing. But as Adam Sieminski says, the growth is in the
1814 emerging markets and those numbers tend to overwhelm what we
1815 are doing.

1816 Dr. {Christensen.} Thank you.

1817 Mr. {Whitfield.} Time is up. At this time I recognize
1818 the gentleman from Texas, Dr. Burgess, for 5 minutes.

1819 Dr. {Burgess.} Thank you, Mr. Chairman, and I thank you
1820 for convening this panel. It really has been a fascinating
1821 morning.

1822 I am going to start off this new session of Congress by
1823 agreeing with the ranking member of our committee. In his
1824 opening statement, he said we must not betray our children
1825 and our future generations. I agree with him. Now, while he
1826 was referencing carbon capture and storage, I would reference
1827 the economic conditions that have prevailed for the past 4 or
1828 5 years. The last Congresses, I was also on the Joint
1829 Economic Commission. It was our duty the first Friday of
1830 every month to receive from the Bureau of Labor Statistics
1831 the employment numbers from the previous month, and you saw a
1832 pattern emerging through all of that bad news, and there was
1833 a lot of bad news during the years, but mining and
1834 manufacturing always led that list of new job creation.

1835 Now, we see this morning Forbes magazine is reporting
1836 that four out of the top 10 best places to live in the world
1837 are in Texas. I knew that. They didn't need to tell me.
1838 But Austin leads the list followed by Houston second, Dallas
1839 third, San Antonio ninth. In fact, the State of Texas has
1840 added almost a half million people over the past years from
1841 last summer to--the summer of 2011 to the summer of 2012, and
1842 the reason for that of course is the availability of energy
1843 and the cost of energy, and while energy in and of itself
1844 cannot be its own end, it does help drive our economy. So
1845 when we talk about not wanting to betray our children and
1846 future generations, I think we have a responsibility to the
1847 economy, and part of that responsibility is the energy supply
1848 that is available to our economy.

1849 Dr. Christensen talked about tipping points. I will
1850 just ask an open-ended question. I know you guys don't like
1851 to speculate, but what kind of tipping point would we have
1852 seen with the economy in the last 4 or 5 years in the absence
1853 of shale? What might have happened to our economy without
1854 the ability to produce this energy and produce these jobs?
1855 And either Dr. Yergin or the Honorable Sieminski, I would
1856 like to hear your thoughts on that.

1857 Mr. {Yergin.} Well, if we had remained on the track
1858 that we had been on prior to when we were going to build all

1859 of those LNG receiving stations, we would probably be
1860 spending \$100 billion a year now to import LNG into the
1861 country, so that would have been a big burden. Secondly, had
1862 we not seen this increase, this substantial increase in oil
1863 production, as I said, this equivalent to Iran's total
1864 exports before sanctions, we would be paying a lot higher
1865 prices for oil, and it would be a much, much tighter and more
1866 vulnerable market and we would not have had what we have seen
1867 is that these supply chains are so long in our economy, these
1868 are dollars that stay here. They are going to jobs here
1869 rather than going into a sovereign wealth fund somewhere else
1870 in the world. So in that other universe, it would have been
1871 a much more difficult picture and more congruent with what
1872 seemed to be the picture in front of people in 2008.

1873 Mr. {Sieminski.} Virtually every economic study that I
1874 have seen suggests that higher domestic production of fuels
1875 leads to greater GDP, and when you get to the import issue
1876 you obviously have lower trade deficit. All of that helps
1877 the economy, leads to greater job creation, as Dr. Yergin
1878 said. I think one of the things to keep in mind is that the
1879 availability of relatively low-cost natural gas has actually,
1880 I believe, helped to sustain some of the growth in wind and
1881 solar on the renewable side because those are intermittent
1882 sources. They need a backup supply and it is often natural

1883 gas that provides the backup for these rapidly growing
1884 renewables that are going to become a fairly significant part
1885 of U.S. energy production and consumption.

1886 Dr. {Burgess.} Sure. We have peaking demands in north
1887 Texas where in the summertime when the air conditioners are
1888 all cranked down low, even if you had a substantial wind
1889 component, you would never be able to keep up with that peak
1890 demand.

1891 I just have to tell you, this is such a different
1892 hearing than we had in this very room in 2008 and, I mean, it
1893 is good news. It is good news for the American people, it is
1894 good news for the American economy. Regardless of political
1895 party or political persuasion, this is a good-news hearing.

1896 The other part of the good news, and Mr. Vidas, I won't
1897 leave you out down on the end, yesterday flying up here
1898 reading in the Star Telegram and the concept of having an
1899 environmentally friendly fracking fluid that is being
1900 developed now by Halliburton in Texas. I understand other
1901 companies are doing that as well. But the technology is
1902 changing and it is changing in a way that is environmentally
1903 responsible, and you referenced some of that in your
1904 testimony but do you have additional thoughts on that?

1905 Mr. {Vidas.} Yes. What I said was there are several
1906 ways in which the industry has tried to adapt their

1907 technologies to reduce the footprint of drilling these wells.
1908 One is the surface footprint and trying to reduce the amount
1909 of space that it takes by combining multiple wells on a
1910 single path, and that can reduce the amount of space used by
1911 a factor of eight. The other point that I made is the
1912 drilling fluids themselves, which in the old days had been
1913 formulated with diesel oil. That has almost totally been
1914 eliminated now, and some of the toxic substances in the frack
1915 fluids are being replaced by more environmentally benign
1916 fluids.

1917 And then the other point that has been raised is the use
1918 of water itself. Typically, a well will take about 3 million
1919 gallons in terms of the fracking process, and one of the ways
1920 the industry is reducing that is by recycling the water and
1921 being able to use it over and over again, and the other thing
1922 that they have been doing is trying to reduce the total
1923 amount of water used by various different techniques
1924 including substituting other fluids such as CO₂, nitrogen and
1925 in some cases propane instead of water.

1926 Mr. {Whitfield.} The gentleman's time is expired.

1927 Dr. {Burgess.} Thank you, Mr. Chairman.

1928 Mr. {Whitfield.} At this time I recognize the ranking
1929 member, Mr. Waxman from California, for 5 minutes.

1930 Mr. {Waxman.} Thank you, Mr. Chairman. I appreciate

1931 that we have made great advances and it is a reason for
1932 celebration. We ought to be very pleased with the advantages
1933 that have come to us with the production of more oil and gas
1934 resources, and we now have advances in technology that have
1935 allowed us to drill in many new areas.

1936 But as we congratulate ourselves for these new
1937 discoveries, we also, I think, need to discuss how energy
1938 choices we are making today will have long-term impacts for
1939 our climate. We have a rapidly diminishing window to act to
1940 reduce our carbon pollution before the catastrophic impacts
1941 of climate change are irreversible.

1942 Ms. Morgan, in your testimony you say the United States
1943 cannot and should not make energy decisions without factoring
1944 in the risks associated with climate change. This committee
1945 is charged with developing energy policy for the United
1946 States. Ms. Morgan, how should this committee factor in
1947 climate when making energy policy?

1948 Ms. {Morgan.} Well, I think that if you look longer
1949 term, it is quite important. First of all, you need to take
1950 into account the intensity, the greenhouse gas intensity of
1951 the fuels you are looking at and you need to put a price on
1952 those fuels in order to drive innovation and energy
1953 efficiency. That is point one. The second point I think is
1954 that although emissions of CO2 have reduced extensively,

1955 which is very good news, they are plateauing out and
1956 emissions of methane and other gases are increasing, so that
1957 means that we need to put in place mandatory and voluntary
1958 approaches to reduce methane emissions as well, and we need a
1959 very solid renewable energy approach. The countries that are
1960 moving forward, you see those kind of three pieces in there.
1961 Carbon pricing, renewable energy policy, energy efficiency
1962 standards are all quite important, and then support
1963 mechanisms around those to make them work.

1964 Mr. {Waxman.} I have been on this committee for a
1965 number of decades, and I remember the period of time when we
1966 decided that we will continue to subsidize the fossil fuels
1967 through not requiring them to pay their external costs and in
1968 some cases directly through the tax code, and we undermined
1969 the alternatives that could have made us less dependent on
1970 these fossil fuels, which made us, of course, more dependent
1971 on Saudi Arabia and Iran and other countries, the OPEC
1972 countries that held us hostage. We made a mistake not
1973 diversifying our energy sources at that time. We should
1974 develop our energy policy under this new circumstance that
1975 doesn't make the same mistakes and put us all in the same
1976 situation where we will look back and regret that we didn't
1977 recognize that our energy policy had to be more thought
1978 through.

1979 What are the potential economic repercussions if we fail
1980 to integrate climate risk with our energy policymaking?

1981 Ms. {Morgan.} I think that there are three main risks.
1982 I think the first really is around stranded investments
1983 because I think companies today that are investing in high-
1984 carbon infrastructure without putting in place the mechanism
1985 to deal with CO2 are being shortsighted and that as climate
1986 change unfortunately gets worse and policies get put in
1987 place, those will be stranded investments, and if we wait to
1988 act, those likely will be more expensive as we go forward.

1989 The second really is missing out on new and existing
1990 markets around the world which are growing exponentially.
1991 You are looking at up to \$7 trillion in new capital and
1992 renewables by 2030 and there is national policies in every
1993 other major economy in the world on renewables. They are
1994 serious about this. They are moving forward for a range of
1995 reasons. And the third are the impacts actually on our
1996 infrastructure itself and on the country, which as you know,
1997 as the EIA said, if we keep going the way we are going, you
1998 are looking at a 10.8-degree Fahrenheit rise in temperature,
1999 which is unprecedented in our time.

2000 Mr. {Waxman.} Dr. Yergin, aside from the investment we
2001 ought to be making and looking at alternative energy sources,
2002 renewables, efficiency, some of that research is threatened

2003 by the budget cuts that members want to make. Do you think
2004 we ought to develop a policy that looks at the environmental
2005 consequences of where we are going in energy development?

2006 Mr. {Yergin.} I think so. In the 1990s, I headed a
2007 taskforce on energy R&D for the Department of Energy, and I
2008 think one of the things, you know, we found very distressing
2009 was this volatility in spending on R&D, and whether you are
2010 talking about, you know, MIT where more people work on solar
2011 than anything else or advances in drilling or whatever it is,
2012 I think that a sustained commitment to R&D--

2013 Mr. {Waxman.} But aside from that--

2014 Mr. {Yergin.} --is the most important investment.

2015 Mr. {Waxman.} I absolutely agree with you, but aside
2016 from that, do you think we ought to make policies in the
2017 energy area that look at not just the research but the
2018 consequences to the future in reducing carbon emissions?

2019 Mr. {Yergin.} I mean, I think so. I think the
2020 environmental considerations obviously should be part of how
2021 you make energy policy.

2022 Mr. {Waxman.} Thank you. Thank you, Mr. Chairman.

2023 Mr. {Scalise.} [Presiding] The gentleman's time is
2024 expired. The gentleman from Louisiana, Mr. Cassidy.

2025 Dr. {Cassidy.} Mr. Yergin, there are those that say
2026 that we shouldn't export liquefied natural gas because in

2027 some way by doing so we will promote the production of more
2028 natural gas and therefore contribute to global warming, but
2029 what you are saying is that is absurd because if we don't do
2030 it, Australia or Canada or some other country will export
2031 liquefied natural gas. Is that a fair statement?

2032 Mr. {Yergin.} Yes, I think people will fill the market
2033 and fill the need, and in fact are racing ahead to do that.

2034 Dr. {Cassidy.} Now, as they race ahead, it is fair to
2035 say that if is a \$5 billion or \$10 billion project to create
2036 one of these export terminals, those are a heck of a lot of
2037 jobs that will be sacrificed because of an absurd premise?
2038 Again, is that a fair statement?

2039 Mr. {Yergin.} The absurd premise is that--

2040 Dr. {Cassidy.} Being that if we don't export liquefied
2041 natural gas, then natural gas will not be mined.

2042 Mr. {Yergin.} Well, I think in fact if you take a
2043 country like China, which as Adam Sieminski pointed out, it
2044 is very heavily oriented towards coal and wants to reduce its
2045 use of coal and use more natural gas to produce electricity
2046 to reduce pollution, they will look in one direction or
2047 another, and if we are sending natural gas we would be
2048 contributing to their reducing their pollution.

2049 Dr. {Cassidy.} So if we can create those jobs, we will
2050 simultaneously improve our economy, but too, improve,

2051 decrease carbon release worldwide potentially?

2052 Mr. {Yergin.} Yes. I think what is happening now is--

2053 Dr. {Cassidy.} I am going to let you hold that.

2054 Mr. {Yergin.} Okay.

2055 Dr. {Cassidy.} Mr. Sieminski, in 2007 you published a
2056 report at the request of Congress demonstrating subsidies for
2057 different sources of fuel, and at that time biofuels got
2058 \$5.72-per-million-BTU subsidy from the government, solar got
2059 \$2.82, coal got 4 cents per million BTU and natural gas got 3
2060 cents per million BTU. Your updated report did not have this
2061 chart, but when we speak about subsidies for various forms of
2062 energy, there is an order of magnitude difference there. Is
2063 that still the ballpark of the federal subsidies?

2064 Mr. {Sieminski.} I would have to look at the numbers,
2065 Congressman, but the number of assumptions and factors that
2066 you have to take into consideration to do those calculations
2067 are numerous and complex, but I think it is fair to say that
2068 in addition to fossil fuel subsidies that there are also
2069 obviously subsidies on renewable fuels and many of the other
2070 things that we do.

2071 Dr. {Cassidy.} Yes, like 100 fold, 100 fold going to
2072 renewables.

2073 Mr. Yergin, back to you. When you were at the World
2074 Economic Summit, you are right, if we don't send energy to

2075 Japan, their economy will tank. That is on my mind when I go
2076 around to the exporters in Louisiana. I say what do you need
2077 to create more American jobs. They say more robust markets
2078 to export to. Right now Japan and Europe are in the
2079 doldrums. We need those economies to do better so we can
2080 create more American jobs.

2081 So is it fair to say, let me ask, at the World Economic
2082 Summit, what is the prognosis for the Japanese economy as an
2083 example if they cannot replace their nuclear capability with
2084 some reasonable--

2085 Mr. {Yergin.} Well, they have turned--I mean, the new
2086 government in Japan is going to reconsider, and I think in
2087 July is going to come out with its policy about whether it is
2088 going to keep some of the plants operating or not. With that
2089 said, the Japanese are kind of in a panic about energy
2090 supplies right now, very focused on LNG as their kind of
2091 major increment, and I think the point you say, a Japanese
2092 economy that is a weak economy as part of a global economy
2093 contributes to global weakness. So we are pretty
2094 interdependent with them. That is why I said, you know, they
2095 are a close ally and if they do well, we do better.

2096 Dr. {Cassidy.} It is in our self-interest to make sure
2097 that they have adequate energy supply.

2098 Mr. {Yergin.} That is right, and it is in our political

2099 interest and it is in our economic interest.

2100 Dr. {Cassidy.} Okay. Sounds great.

2101 Ms. Morgan, you spoke about methane emissions. I think
2102 it is important to make sure the record is straight. A lot
2103 of times folks who are critical of natural gas state that
2104 the--quote that Cornell study, Mr. Howarth's study, and which
2105 finds very high levels of methane released with natural gas
2106 production. But just to set the record straight, that is
2107 kind of an outlier study, isn't it? I mean, both the
2108 Department of Energy as well as MIT peer-reviewed study have
2109 found a tenth of the emissions as the Howarth study. Is that
2110 a fair statement?

2111 Ms. {Morgan.} We are actually in the process of putting
2112 out a study on this. We think that that study is on the
2113 upper end.

2114 Dr. {Cassidy.} The Howarth study is on the upper end?

2115 Ms. {Morgan.} Yes, but that there are also real
2116 measures that can be put in place to control methane even on
2117 the lower level that are important.

2118 Dr. {Cassidy.} Mr. Yergin?

2119 Mr. {Yergin.} Just to add, I know my colleagues in the
2120 Howarth study used data that supposedly came from us, and my
2121 colleagues had written a letter to the journal which was
2122 published saying the data had been quite distorted, and there

2123 is now a cooperative program with the Environmental Defense
2124 Fund and a number of companies to actually measure methane
2125 and come out with some hard data on it.

2126 Dr. {Cassidy.} I just say that because Ms. Morgan, your
2127 testimony suggested that the lifecycle carbon release of
2128 natural gas is not as favorable as we would presume, but that
2129 really seems to assume the Howarth study is valid, and
2130 frankly, there seems to be a general agreement that it is
2131 not.

2132 Ms. {Morgan.} I think even on the lower levels, it is
2133 important to put in place measures to deal with--

2134 Dr. {Cassidy.} Well, I am not arguing that. I am just
2135 saying the lifecycle release has been overstated.

2136 Ms. {Morgan.} The lifecycle as a whole, that study does
2137 overstate it.

2138 Dr. {Cassidy.} I yield back. Thank you.

2139 Mr. {Scalise.} The gentleman's time is expired. The
2140 gentlelady from Florida, Ms. Castor.

2141 Ms. {Castor.} Good morning, and thank you very much for
2142 your insightful testimony.

2143 The outlook from the Energy Information Agency is very
2144 positive for the economy and I think beyond the current
2145 outlook there is great potential for additional economic
2146 growth tied to domestic supplies if we have the appropriate

2147 environmental safeguards, and I think here in America we can
2148 do more for consumers and for electric reliability or
2149 reliability from all energy sources. But in order to build
2150 that more sustainable energy system, we need to bring greater
2151 balance between fossil fuels and renewable sources, and I
2152 don't think it is all about generating energy from cleaner
2153 sources. We also need to make our economy more efficient so
2154 that we use less energy overall, and I think that it may be
2155 time to look at the business models for utilities and the
2156 incentives and modernizing those business models.

2157 According to the IEA, energy efficiency is an enormous
2158 unrealized opportunity for the world to reduce energy use and
2159 thereby carbon pollution. The IEA projects two-thirds of
2160 potential efficiency gains will remain untapped through 2035
2161 under current policy. That is a real hit on the pocketbooks
2162 of American families and businesses.

2163 Ms. Morgan, in your testimony you say the United States
2164 has immense remaining potential for improving efficiency in
2165 its industrial, transportation and building sectors. Which
2166 energy efficiency measures have the most potential to reduce
2167 energy consumption from the U.S. industrial sector?

2168 Ms. {Morgan.} I think there are a number of different
2169 measures, and they can come in on either the State level or
2170 on a national level. There is tremendous potential of

2171 combined heat and power on the State level for industrial
2172 facilities. In the building sector, certainly also you look
2173 at both the opportunity for new business models but also for
2174 jobs in retrofitting buildings. There is great potential
2175 there. And certainly, you know, the evidence base is quite
2176 strong if you look at the benefits that have come from the
2177 new car standards that have been put in place.

2178 Ms. {Castor.} Can you give me some more specific
2179 examples or the most innovative energy measures in use today?
2180 Are there energy efficiency measures being implemented at the
2181 State level or abroad that we should expand or employ on a
2182 national level?

2183 Ms. {Morgan.} There is a program actually in Germany
2184 that is very focused on the retrofitting of buildings and you
2185 need to look at the ownership structure obviously but they
2186 are looking at how you can get at the point that the owner
2187 and the renter don't always share the benefits and looking at
2188 new models of how they can put in place measures to retrofit
2189 those buildings extensively across the country. They are
2190 funding that actually with revenue from their emissions
2191 trading system so it is not additional funding coming in. I
2192 think that is a very strong example. You actually have a
2193 very strong program in China around their enterprises as well
2194 where they are putting in place measures to share practices

2195 and set targets for companies to increase their efficiency.

2196 Ms. {Castor.} And in your written testimony, you state
2197 that the federal government can play an important role in
2198 improving energy efficiency across the economy. You said the
2199 first step is to support programs that ensure consumers can
2200 make informed choices. What were you talking about? What
2201 else can the Congress do to encourage consumers to make
2202 energy-efficient choices in the marketplace?

2203 Ms. {Morgan.} I think there are things like smart
2204 metering, information provided in all products that is much
2205 clearer about energy saved, money saved, CO2 saved. There is
2206 ways when you start looking at our grid on the smart metering
2207 side of things. I think if consumers first of all have more
2208 information but then also, you know, can be able to buy the
2209 top products as affordably as possible.

2210 Ms. {Castor.} Wouldn't it help if then the electric
2211 utilities really had an incentive to promote conservation and
2212 greater efficiency? They would help empower consumers to do
2213 that. It would be a win for families. They would have more
2214 money to spend at home, and the utilities, their business
2215 would change a little bit. For example, in my neck of the
2216 woods, we have this terrible debacle with a broken nuclear
2217 power plant, and it is enormously expensive, and we like the
2218 diversity in power supply, it is very important, but it seems

2219 now that we would get more bang for the buck if we helped
2220 save energy and the utility had some incentive. Where is
2221 that happening? Are those discussions happening?

2222 Ms. {Morgan.} Yes, they are happening somewhat on the
2223 State level, I think, in certain States where you have these
2224 kind of demand-side management models that are put together
2225 where both utilities and consumers benefit. I think they
2226 need to be much more broadened out so that they occur across
2227 the country more systematically.

2228 Ms. {Castor.} Do any of you have information on those
2229 kind of incentives of changing the business model?

2230 Mr. {Sieminski.} I could just add very quickly that the
2231 lighting standards that have been put in place starting this
2232 year, changes in appliance efficiency, the improvements in
2233 auto fuel efficiency, lower vehicle miles traveled, all of
2234 that is leading to lower energy use per capita, which is
2235 good. You are getting more value for less consumption.

2236 And quickly, the difference between the new auto fuel
2237 efficiency standards that got adopted last year so between
2238 2012 and 2013 in our forecast by the year 2035 that is worth
2239 something like 1-1/2 million barrels a day of oil imports.

2240 Ms. {Castor.} Thank you very much.

2241 Mr. {Scalise.} The gentlelady's time is expired. The
2242 gentleman from Texas, Mr. Olson.

2243 Mr. {Olson.} I thank the Chair, and welcome to the
2244 witnesses. I thank you for your time and expertise as we lay
2245 the groundwork for a broader discussion about federal energy
2246 policy and the importance of robust domestic energy industry.
2247 I want to dig a little deeper into the geopolitical
2248 challenges we are facing in the new energy era. As we move
2249 forward as a Nation, we need to better understand how our
2250 newly realized energy resources can advance our foreign-
2251 policy goals.

2252 One historic example of how U.S. production or a lack
2253 thereof impacts the geopolitical landscape, the Persian Gulf.
2254 At the end of World War II, our geopolitical focus was on
2255 containing communism. When I joined the Navy in 1989, we had
2256 four numbered fleets: the 2nd Fleet in the Atlantic, the 6th
2257 Fleet in the Mediterranean Sea, the 3rd Fleet in the eastern
2258 Pacific and the 7th Fleet in the western Pacific in Japan.
2259 Communism fell in 1991, and as a result, our global military
2260 forces changed dramatically. We added the 5th Fleet in the
2261 Persian Gulf. We disestablished the 2nd Fleet in the western
2262 Pacific in September of 2011, and the 7th Fleet has now
2263 become the largest fleet in our Navy, and it is ramping up
2264 very quickly with China's aggression in the South China Sea.
2265 American innovation and our abundant energy resources can and
2266 should be leveraged to protect our allies around the world

2267 from unreliable and unfriendly regimes and promote our
2268 interests.

2269 Another example of how U.S. energy supply can strengthen
2270 our relationships with important countries is India. They
2271 have the world's largest democracy and they are in a pretty
2272 unreliable neighborhood. They have Pakistan to the west,
2273 China to the north, Bangladesh to the east. I had lunch with
2274 the Indian counsel general in Houston a couple weeks ago. We
2275 spoke for 20 minutes about India getting U.S. LNG, export
2276 natural gas to India. Right now they have got a big problem:
2277 they have no pipelines. Because of their neighbors, they
2278 can't have overland pipelines so all their energy supply has
2279 to come in the form of oil or gas, has to come either via
2280 train or via boat, mostly boat. They want to be our partner.

2281 And so my question for you, Dr. Yergin, in your view,
2282 how can our energy resource base reshape our foreign-policy
2283 objectives? What countries should we develop or strengthen
2284 our ties with and how can we pressure rogue states without
2285 relying on military intervention?

2286 Mr. {Yergin.} Well, that is a big question. I think
2287 that first we are seeing, as we have been describing, a
2288 rebalancing of global oil that is occurring and that we will
2289 see the Western hemisphere largely self-sufficient in years
2290 to come and more of the oil from the Middle East going to the

2291 Far East, so I think that is kind of one of the fundamental
2292 changes. I think what you referred to with India, I found
2293 when I was in Asia recently in Singapore and other countries
2294 also that interest in seeing the United States at least a
2295 player as an energy exporter, if not a massive one, because
2296 for them it is diversification and they would like to
2297 actually be more reliant and diversified more to depend upon
2298 the United States. I think as these technologies develop and
2299 we see it develop elsewhere, a key country actually is what
2300 Mexico does in terms of opening itself up to these new
2301 technologies. It is something that I think is right on the
2302 foreground.

2303 In terms of new relationships, Brazil is on course to be
2304 a global energy powerhouse and I think the U.S.-Brazilian
2305 relationship is one that grows in significance for us. So
2306 those would be some of the changes.

2307 Mr. {Olson.} How about Eastern Europe, who buys their
2308 natural gas largely from Russia?

2309 Mr. {Yergin.} Well, Poland is very interested in--it is
2310 interesting, you have different mixes in Europe on policy.
2311 Poland certainly wants to develop its shale gas to reduce its
2312 dependence on Russian gas, and Ukraine, of course, there is
2313 constant friction between Russia and Ukraine over the price
2314 of natural gas, and Ukraine, I think just last week or the

2315 week before, started signing some large agreements to develop
2316 shale gas in Ukraine, and for them, it is not only economic
2317 but it is also a geopolitical development.

2318 Mr. {Olson.} I get emails back home every week from
2319 people along the Silk Road, you know, where Turkey starts and
2320 heads east toward all those countries right there, the former
2321 Soviet states up there on the Caspian Sea, they want our
2322 natural gas. So again, I think it is a great opportunity for
2323 our country to actually have an influence on these people,
2324 make some friends, create American jobs, and again--

2325 Mr. {Yergin.} And I think they wanted to be integrated
2326 in the global markets as a way to sustain their nationhood.

2327 Mr. {Olson.} Yes, sir. It looks like I am out of time.
2328 I yield back the balance of my time. Thank you.

2329 Mr. {Whitfield.} At this time I recognize the gentleman
2330 from Pennsylvania, Mr. Doyle, for 5 minutes.

2331 Mr. {Doyle.} Thank you, Mr. Chairman, and thank you to
2332 our witnesses today.

2333 This morning we are discussing a new landscape for North
2334 America's energy resources and how we develop an effective
2335 energy policy in the absence of resource scarcity. In my
2336 home State of Pennsylvania, especially in western
2337 Pennsylvania where I represent, we are experiencing a surge
2338 in energy development that each of you have discussed in your

2339 testimony. In my neck of the woods, we have natural gas,
2340 coal, nuclear. We have got steelworkers making wind
2341 turbines. We have got universities producing energy startups
2342 that are harnessing renewables. Marcellus shale alone in my
2343 State has provided thousands of new jobs and we are burning a
2344 cleaner fuel for our transportation and electric industries.
2345 So it is important to me that policymakers fully understand
2346 energy reserves that we have and the best ways to develop
2347 them. But something that is equally important to me is how
2348 we manage the effects of carbon emissions that come from
2349 burning these resources. I have worked many years on this
2350 committee--this is my 13th year on the committee and the 19th
2351 year in Congress--to do this in a comprehensive way, and I
2352 think most of the members of this committee know that I want
2353 to get our fossil fuel resources out of the ground. I don't
2354 think it has to be an either-or proposition. But what I am
2355 interested in is how we find that sweet spot where we can
2356 develop North American energy resources and effectively
2357 manage our carbon emissions simultaneously.

2358 So I have some questions about that, but before I ask
2359 those questions, I just want to provide some clarity to
2360 something that we heard at this hearing, and we hear a lot.
2361 My good friend, Mr. Scalise--and he is my good friend--had
2362 asked Ms. Hutzler why we weren't seeing more development on

2363 federal lands, and her reply was that the permitting process
2364 takes up to 300 days. I want to put a map up on the screen
2365 that I think we have that I think should provide a little bit
2366 of clarity. As you look at the United States, that dark
2367 area, the gray shaded area, that is the federal lands, and
2368 the light red, the pinkish area, is where our oil and gas
2369 shale plays are, and then the dark red that you see is where
2370 there is an overlap of federal lands and oil and gas shale
2371 plays, and Mr. Sieminski, I think back in August you
2372 testified to this committee that because basically the shale
2373 resource basins are largely outside of the federal lands, so
2374 too is the shale production, I think your quote was in this
2375 case the geology is working in favor of non-federal
2376 landowners.

2377 So we hear this a lot that, you know, there is all this
2378 development that could be taking place on federal lands but
2379 the permitting process is so bad, and I think the map pretty
2380 graphically illustrates that there is just not much federal
2381 lands where the oil and gas shale plays are in the United
2382 States. I just wanted to provide that for clarification.

2383 I want to ask Dr. Yergin and Ms. Hutzler too, you both
2384 briefly addressed climate change and greenhouse gases in your
2385 written testimonies, and I just wonder, as we start to
2386 reassess these vast new energy resources, and it is not that

2387 they are new, you know, technology has given us a way to make
2388 them economically feasible to go and recover them now, right?
2389 And everything we do is a technology question, whether it is
2390 how we dispose of nuclear waste, what do we do with carbon
2391 emissions, just all of this, the answer is in technologies,
2392 and we are discovering new ways to do things in a more
2393 environmentally sound way. We hear about new types of
2394 fracking fluids because there is this tremendous potential to
2395 get this out of the ground, and I guess my question is, I am
2396 interested to hear, do you believe that we should also factor
2397 in climate change in these environmental concerns? Because
2398 it seems to me that once industries, you know, have to
2399 address these carbon issues too, we are going to see
2400 technology innovations there also that are going to be very
2401 valuable to U.S. companies to help these economies like in
2402 China and India and others. They are not going to be the
2403 leaders in figuring out to deal with carbon emissions. That
2404 is going to hopefully come here and then we are going to sell
2405 that technology all over the world. So I guess what I want
2406 to ask you is, do you think we should factor this in as we
2407 are looking at a new energy policy and these new fuels,
2408 factoring in environmental concerns and climate change as we
2409 develop policy?

2410 Mr. {Yergin.} I think we are certainly factoring them

2411 in. As I said, I had spent some time on that Secretary of
2412 Energy Advisory Board committee that I think provided a
2413 framework for looking at the environmental questions and
2414 saying how do you address them, and there is climate change
2415 but there is also the water questions, what do you do about
2416 wastewater, questions that you know very well from your
2417 district that need to be addressed. I think that as we have
2418 just discussed, understanding the methane emissions from
2419 natural gas drilling is a very important contribution to it.
2420 There are different views as to what the results will be.

2421 And I would say that the other thing is that you have to
2422 see this in an entirety. It is not that we are going to more
2423 oil because we are producing oil but it means our cars, as
2424 Adam says, are going to get a lot more efficient as we do it
2425 but the question is, is that oil going to be produced in the
2426 United States or are we going to import it. So we have to
2427 see it in the framework.

2428 Ms. {Hutzler.} I want to address your map again, and
2429 maybe that is the case for the shale formations, but on the
2430 other hand, the federal government has a lot of non-shale-
2431 based areas that--

2432 Mr. {Doyle.} But all the growth is in the--I mean, the
2433 boom we are seeing right now is happening because we figured
2434 out how to get this oil and gas out of shale.

2435 Ms. {Hutzler.} Well, let us take the offshore area in
2436 terms of oil drilling. We were drilling a lot, and as a
2437 matter of fact, the oil numbers offshore in fiscal year 2010
2438 were very high but then it dropped by 17 percent. So you can
2439 still get a lot of oil offshore if you allow the permitting
2440 to go on.

2441 Mr. {Doyle.} The point is, we are seeing this huge boom
2442 in oil and gas shale and it basically exists on non-federal
2443 land, so I just think it is somewhat of a red herring.

2444 Mr. Chairman, I see my time is up.

2445 Mr. {Whitfield.} The gentleman's time is expired. At
2446 this time I recognize the gentleman from Colorado, Mr.
2447 Gardner, for 5 minutes.

2448 Mr. {Gardner.} Thank you, Mr. Chairman, and thank you
2449 to the witnesses today, and if I could have that last slide
2450 put up on the screen again, that would be fantastic.

2451 If you look at the State of Colorado as it appears on
2452 the map that is right there, you can see the state of
2453 Colorado. That red spot is in my district in northern
2454 Colorado. But there is tremendous opportunity for
2455 development in the gray spots, and a lot of that gray spot
2456 that you see in Colorado with the Rocky Mountain areas, it is
2457 BLM land, it is U.S. Forest Service land. They are unable to
2458 get permits through the BLM because of various bureaucracies.

2459 In fact, according to the Western Energy Alliance, over
2460 100,000 jobs could be created in the western United States,
2461 primarily on those gray lands, if the permitting delays were
2462 simply lifted. Over 100,000 jobs could be created in the
2463 western United States. That is not because all the
2464 development is taking place in the red areas or the pink
2465 areas. That is because Bureau of Land Management and other
2466 agencies have been so slow in their permitting that we can't
2467 get those permits through to create those kinds of jobs. So
2468 I think you would see a lot more red areas if we could
2469 actually get a government that was willing to allow us access
2470 to those resources in a responsible manner, and so I for one
2471 would like to see over 100,000 jobs being created in the
2472 western United States.

2473 But I would also like to ask a couple of other
2474 questions, pointing out that in that red area you see in
2475 northern Colorado right there, because that development is
2476 taking place in that play. There was an article in Greeley
2477 Tribune on January 17 that said--the Greeley Tribune is the
2478 newspaper in northern Colorado--that said Weld County rose 20
2479 spots in a year to rank number 42 in the Nation in job and
2480 wage growth. There was an article in that same newspaper
2481 January 8, 2013, that said Weld County wage growth hits
2482 number five in the Nation because of in great party the

2483 energy development that is taking place in Colorado. So we
2484 can see the opportunities, and I believe it was Ms. Hutzler
2485 that talked about the amount of economic impact that we have
2486 seen. I think your statement--what was it again you said
2487 about the trillion dollars over 30 years? What was the
2488 amount of money you said as a result of development?

2489 Ms. {Hutzler.} If we opened up new areas onshore and
2490 offshore to development, that we would get over the next 37
2491 years \$14.4 trillion to the economy.

2492 Mr. {Gardner.} And I believe the President's budget
2493 said that if we had--and I am going to get this number in the
2494 ballpark--if we had 1 percent GDP growth over the next 10
2495 years, we would generate around \$2 billion or so in new
2496 revenues for the federal government, so you can see the kind
2497 of activity, the GDP growth we would see, the kind of GDP
2498 growth we would see as a result of energy development across
2499 the country.

2500 Ms. Hutzler, you mentioned the permitting delays on
2501 federal land. What do we need to do in order to alleviate
2502 those delays?

2503 Ms. {Hutzler.} We need to make the process more
2504 streamlined. We need to get rid of all the red tape and the
2505 delays and look at the States to see how they are doing it to
2506 remove those delays or in fact allow the States to actually

2507 do the permitting because they certainly know the geologic
2508 areas and what is best for the State.

2509 Mr. {Gardner.} Ms. Morgan, you had said something in
2510 your statement regarding 2050 carbon emissions. Is that
2511 reducing carbon emissions by 80 percent by 2050? Twenty
2512 percent of today's carbon emissions would be, what, about a
2513 billion tons of CO2? Is that roughly what it would be?

2514 Ms. {Morgan.} Roughly, yes.

2515 Mr. {Gardner.} Can you give me an emissions inventory
2516 for 2050 of specific sources that would add up to 1 billion
2517 tons in CO2?

2518 Ms. {Morgan.} In 2050?

2519 Mr. {Gardner.} Yes, a specific inventory of emissions.

2520 Ms. {Morgan.} Well, I can certainly--I mean--

2521 Mr. {Gardner.} Does the technology exist today to do
2522 that?

2523 Ms. {Morgan.} Yes, it does exist today. The National
2524 Renewable Energy Laboratory actually said you can get to the
2525 80 percent renewables by 2050 with existing technologies.
2526 What the inventory would be then would be much less CO2.
2527 There would probably be a bit left over in some of the non-
2528 CO2 gases. But the point is that I think if we were to build
2529 out and put in place the policies, you can find that sweet
2530 spot of extracting or clean energy resources while also

2531 producing the gas in a more climate-friendly fashion.

2532 Mr. {Gardner.} And I think that is something that I
2533 have long been supportive of is an effort to find a sweet
2534 spot when it comes to bulk renewable alternative energy
2535 sources as well as traditional energy sources, but
2536 unfortunately, what I see in Colorado and what I see out of
2537 this Administration are attempts to actually make it more
2538 difficult to develop that traditional resource. In fact, I
2539 was reading a letter from one of the EPA regions, I believe
2540 it was region 3 of the EPA, concerning an LNG export facility
2541 that they were asking how many new wells would have to be
2542 drilled across the country as a result of that one single LNG
2543 facility, and I think when we start asking those kinds of
2544 questions, what happens to this LNG to wells being drilled in
2545 Colorado, that seems to me to be a very adverse tone for
2546 energy production in this Nation.

2547 I see my time is expired and I will yield back.

2548 Mr. {Whitfield.} At this time I will recognize the
2549 gentleman from New York, Mr. Tonko, for 5 minutes.

2550 Mr. {Tonko.} Thank you, Mr. Chair, and thank you to the
2551 witnesses for presenting at this hearing.

2552 There has been a lot of discussion about the oil and gas
2553 production and the estimates of oil and gas reserves. I
2554 believe there is most likely this gap between proven and

2555 technically recoverable reserves. To what degree, if any,
2556 have the environmental costs of exploiting oil and gas been
2557 considered in estimating the technically recoverable
2558 reserves? Anyone?

2559 Mr. {Vidas.} I can try to address that issue. In the
2560 work that we have done, we have defined technically
2561 recoverable to be based on current technology and current
2562 activity, so we apply a factor of so many bcf or so many
2563 barrels per well based on what is going on right now. So it
2564 does not take into account future changes to regulations that
2565 might change the cost.

2566 However, when we look at the economically recoverable
2567 resource base, which is a subset of the technically
2568 recoverable, we have to make certain assumptions about the
2569 costs. So depending on what kind of scenario we are looking
2570 at, we may use today's costs, which are based on today's
2571 environmental rules, or we may hypothesize new regulations
2572 that might be imposed in the future. And typically when we
2573 look at that, we would look at a series of different rules
2574 about water use, different types of materials that can be
2575 used and so on, and generally when we have looked at that, we
2576 would say that the future regulations might add something
2577 like 7 percent to the cost of a well, so that would produce
2578 then a resource cost that would be about 7 percent higher

2579 than today's cost, but of course, that depends on what
2580 regulations are implemented in the future.

2581 Mr. {Tonko.} Anyone else? Many of you did not respond,
2582 so I am assuming there was no environment cost. Ms. Morgan?

2583 Ms. {Morgan.} Yes, sir. I believe that environmental
2584 costs are actually not factored in, and we would be happy to
2585 provide data from a recent National Academy of Sciences
2586 report on the climate and non-climate impacts that has a
2587 United States focus.

2588 Mr. {Yergin.} If the environmental costs, if you mean,
2589 for instance, regulations that require how you manage water,
2590 how you manage land, how you manage air quality, those are
2591 all environmental costs that are then internalized because
2592 they are part of the regulatory process.

2593 Mr. {Tonko.} Well, Dr. Yergin, you discussed the
2594 implications of the expansion in gas production for our
2595 domestic markets and for the global market. The demand in
2596 the United States has leveled out recently but global oil
2597 consumption continues to expand and fossil fuel use continues
2598 to expand. How do the rates of increase in our reserves
2599 compare to the rate of increase in oil and gas consumption
2600 globally?

2601 Mr. {Yergin.} Globally, the world is now divided into
2602 two. There is the OECD, the United States, western Europe,

2603 Japan where we really started in about 2005, 2007 to have
2604 peak demand in terms of oil and our oil consumption is going
2605 to go down, not up, because of more efficient cars, because
2606 of demographic changes in our population, because people
2607 reach a limit to how many hours they want to spend sitting in
2608 a car, so I think that is happening, but the great boom is of
2609 course in the emerging markets and they roughly now consume
2610 about the same amount of oil as the advanced markets but that
2611 is where all the growth is going to be. China in 2000 sold 2
2612 million new cars, we sold 17 million new cars. By 2010, we
2613 were selling 12 new cars and they were selling 17 million.
2614 So that tells you where the growth is going to be.

2615 Mr. {Tonko.} And we are experiencing this period of
2616 relative abundance but we have been there before in our
2617 recent past history, so oil and gas markets are volatile and
2618 have led us to a false sense of energy security in the past.
2619 So how do we develop a national energy policy that is less
2620 shortsighted and more strategic? Basically, how can we best
2621 use these reserves to maximize--

2622 Mr. {Yergin.} Well, what you said is quite right, that
2623 what we have seen overall, this is just development in the
2624 last 3 or 4 years and we are focusing this discussion and our
2625 resource base, but look at the Middle East. I mean, people
2626 used to talk about the arc of instability going from Syria to

2627 Iran. Now they talk about it going from the Sahel in Africa
2628 to central Asia. So you look at the map and there are many
2629 parts of the world which have abundant energy supplies, where
2630 there is a lot of very evident political risk, and I think
2631 your point that we shouldn't--there is no reason here for
2632 complacency.

2633 Mr. {Tonko.} Ms. Morgan?

2634 Ms. {Morgan.} I just wanted to say that I think that if
2635 you look at the--we really can pull out all of our resources,
2636 that we don't need to be thinking of an either-or, and that
2637 renewable energy resources, energy efficiency and CCS are all
2638 part of that and you need to take that longer-term view or
2639 else we will be making shortsighted decisions and not
2640 building the CCS in now to our gas and oil decisions.

2641 Mr. {Tonko.} Thank you very much. With that, I yield
2642 back.

2643 Mr. {Whitfield.} Thank you very much. At this time I
2644 recognize the gentleman from Virginia, Mr. Griffith, for 5
2645 minutes.

2646 Mr. {Griffith.} Thank you, Mr. Chairman. I have to say
2647 I think we have to use all of our energy resources to develop
2648 a plan long term.

2649 That being said, in regard to natural gas, Administrator
2650 Sieminski, you would expect at some point in the next few

2651 years for gas to return to \$4? Is that correct?

2652 Mr. {Sieminski.} We have natural gas prices getting
2653 back to \$4 a million BTUs by the end of next year.

2654 Mr. {Griffith.} Okay. And in fact, they have been
2655 going up. They hit a low in April of \$1.95 and in December
2656 they were \$3.34. Is that correct?

2657 Mr. {Sieminski.} I believe so, sir.

2658 Mr. {Griffith.} And if I understood your testimony
2659 earlier, when it gets to \$4, coal becomes very competitive
2660 again?

2661 Mr. {Sieminski.} It is a sliding scale but as natural
2662 gas prices go higher, coal becomes more attractive.

2663 Mr. {Griffith.} I appreciate that very much coming from
2664 a coal district, and I will turn to you, Ms. Hutzler.

2665 A lot of what we have been doing has been ignoring coal
2666 and its potential as a major resource in this country. It
2667 has always been that way. And I would point out that I think
2668 in your testimony you said that we relied on three major
2669 sources. Of course, we have got our renewables but our three
2670 major sources are nuclear, coal and natural gas. Is that
2671 correct?

2672 Ms. {Hutzler.} Yes.

2673 Mr. {Griffith.} And I think you also reported that just
2674 the mercury utility MACT rules would cost about \$21 billion a

2675 year and 183,000 jobs a year. Is that correct?

2676 Ms. {Hutzler.} Yes.

2677 Mr. {Griffith.} And that retirement of coal power
2678 plants by 2016, we are going to be retiring 27 gigawatts. Is
2679 that also accurate?

2680 Ms. {Hutzler.} I think that is through 2015 and that is
2681 an EIA number that has been reported to them by electric
2682 utility companies.

2683 Mr. {Griffith.} All right. And that is much higher
2684 than the EPA's estimates when they first came out with this
2685 new regulation. Isn't that correct?

2686 Ms. {Hutzler.} Yes.

2687 Mr. {Griffith.} And in fact, not only is it going to
2688 affect jobs in the coal fields and at coal-fired power
2689 plants, but it also will cause our electric rates to go up by
2690 10 to 20 percent in most of the country. Isn't that correct?

2691 Ms. {Hutzler.} Yes.

2692 Mr. {Griffith.} And in fact, in some parts in the
2693 Midwest, I don't represent them but in some parts it could be
2694 right up there at the 20 percent.

2695 Ms. {Hutzler.} Yes, in States that are highly dependent
2696 on coal-fired generation.

2697 Mr. {Griffith.} Now, you acknowledge in your written
2698 testimony that the EPA claims that they are not going to do

2699 this but you do raise some concern and worry that the EPA may
2700 decide that the modifications in regard to greenhouse gases
2701 could impact existing coal-fired power plants because that
2702 would force them to, if they interpreted that complying with
2703 Utility MACT created them into a new source that that would
2704 then put a tremendous amount of pressure on the existing
2705 coal-fired power plants and cause even more closures. Is
2706 that correct?

2707 Ms. {Hutzler.} Yes, because under the Utility MACT
2708 rule, if there are substantial changes, they might be able to
2709 look at that particular unit as a new unit and therefore
2710 treat it as a new unit where they don't want the amount of
2711 greenhouse gas emissions to be any more than from a natural
2712 gas plant essentially.

2713 Mr. {Griffith.} And you cited a report from the United
2714 Mine Workers of America that would indicate that if that were
2715 to happen, that job losses could amount to more than 50,000
2716 direct jobs if you could coal, utilities and the railroad
2717 industry, and as much as 250,000 jobs indirect. Is that a
2718 correct assessment of what the UMWA said?

2719 Ms. {Hutzler.} Yes.

2720 Mr. {Griffith.} So this is of great concern in my area
2721 because we have railroads, coal and utility companies.

2722 I would point out also that it is kind of interested

2723 that your written testimony indicates that the Chinese are
2724 using about four times as much coal as we are and that while
2725 they are building cleaner plants, they are not putting their
2726 older, less clean plants out of existence in the meantime,
2727 are they?

2728 Ms. {Hutzler.} No, they are not. With their GDP
2729 growth, they need all the power they can get, and in fact,
2730 according to the National Energy Technology Laboratory, they
2731 are building 60 to 80 gigawatts of coal-fired plants a year,
2732 and they think that will happen easily through 2016 and maybe
2733 further.

2734 Mr. {Griffith.} And so they are relying on coal
2735 including maybe some of our coal to generate their energy and
2736 the growth in their economy. Isn't that true?

2737 Ms. {Hutzler.} Yes. They have to import coal now.
2738 They can't produce enough themselves to satisfy their demand
2739 and we are exporting coal to them.

2740 Mr. {Griffith.} And so when I tell my constituents that
2741 not only are we damaging coal but we are also damaging jobs
2742 in the United States, we are allowing the Chinese to grow
2743 their economy while retarding our economy by not using our
2744 clean coal technology. Isn't that correct?

2745 Ms. {Hutzler.} Yes.

2746 Mr. {Griffith.} And in fact, in my district there is a

2747 plant that just opened this year that is extremely clean, and
2748 because of the carbon rules, the greenhouse gas rules, it
2749 wouldn't be allowed to be built if it hadn't already been in
2750 construction and opened this year. Isn't that correct?

2751 Ms. {Hutzler.} Yes.

2752 Mr. {Griffith.} And so for all intents and purposes, at
2753 least at this point in history, there is not the technology
2754 available for the United States to build any more clean coal
2755 plants, coal-fired electric generation plants, and we are
2756 really handicapping ourselves in relationship to our
2757 competitiveness with the Chinese. Isn't that also true?

2758 Ms. {Hutzler.} Yes. We don't--currently, CCS
2759 technology is not available, commercially available for these
2760 plants.

2761 Mr. {Griffith.} I thank you, and I yield back, Mr.
2762 Chairman.

2763 Mr. {Whitfield.} At this time I recognize the honorable
2764 gentleman from Massachusetts, Mr. Markey, for 5 minutes.

2765 Mr. {Markey.} I thank the gentleman very much.

2766 Just a point. In 2009 in this committee and on the
2767 House Floor, Mr. Waxman and I built in \$60 billion for clean
2768 coal technology, carbon capture and sequestration. We voted
2769 it out of this committee with no Republican support. Over
2770 the last 5 years, unfortunately, coal has dropped from 51

2771 percent down to 35 percent of all electrical generation in
2772 the country, and what has gone up? Natural gas. It is less
2773 expensive and it is cleaner. So coal is being attacked but
2774 it is by the natural gas industry, so let us just get that
2775 clear, and we put the \$60 billion in and the coal industry
2776 opposed the Waxman-Markey bill. They opposed now, and now
2777 they suffer from not having the investment in technology to
2778 make it cleaner. So don't blame us, blame the coal industry
2779 for not wanting the funding and blame the natural gas
2780 industry for their technological breakthroughs that have
2781 allowed for the production of more and cheaper and cleaner
2782 sources of energy.

2783 Mr. Sieminski, recently the Department of Energy
2784 released a study of the economic impacts associated with
2785 exporting large quantities of natural gas that was performed
2786 by NIRA Consulting. The study used outdated 2010 EIA
2787 projection data and concluded that while exports would lead
2788 to higher domestic energy prices and adverse impacts to
2789 American manufacturing, the overall economic impact would be
2790 positive. Mr. Sieminski, isn't it true that EIA's 2010 data
2791 predicted that domestic natural gas use in the power sector
2792 would decline between 2010 and 2020, though its use in the
2793 power sector has actually ended up growing by 27 percent just
2794 since 2010?

2795 Mr. {Sieminski.} I have been in the forecasting
2796 business a long time--

2797 Mr. {Markey.} No, I am just asking, is that true or
2798 not? I am not asking for your personal history.

2799 Mr. {Sieminski.} Yes.

2800 Mr. {Markey.} Okay. That is all I needed to know. So
2801 way off. EIA was way off. Natural gas and the utility
2802 sectors not only did not gone, it has now gone up 27 percent
2803 since that report. Isn't it true that EIA's current
2804 projections of natural gas use in the transportation sector
2805 are seven times as high as the 2010 data used in the NIRA
2806 study?

2807 Mr. {Sieminski.} And our supply estimates are also
2808 higher.

2809 Mr. {Markey.} I am only--I am not asking you--I am
2810 asking you to just go back to this study that is being relied
2811 upon. Is it not seven times higher in the transportation
2812 sector than NIRA projected in just 2010?

2813 Mr. {Sieminski.} Yes, sir.

2814 Mr. {Markey.} Okay. Thank you. So this data was
2815 released in 2010, and since then 100 major manufacturing
2816 projects totaling \$95 billion in investment have been
2817 announced. These are manufacturing facilities that would
2818 produce chemicals, fertilizer, steel, aluminum, gas, tires,

2819 plastics and other goods, all of which rely on cheap natural
2820 gas. That is what is driving this manufacturing. These
2821 announced projects alone would push U.S. industrial demand
2822 for natural gas 30 percent beyond the estimates used in the
2823 NIRA study. Just yesterday, the Wall Street Journal
2824 described decisions made by German and Canadian companies to
2825 locate new facilities in the United States because of low
2826 natural gas prices. The Germans, the Canadians are coming to
2827 the United States with their manufacturing facilities.

2828 Do you believe that we should be making decisions about
2829 what to do with domestic natural gas in 2013 and beyond using
2830 data that reflected what was going on in that sector 3 years
2831 ago that vastly underestimated what is happening today?

2832 Mr. {Sieminski.} I think it is always better to have
2833 recent and accurate data in making forecasts but--

2834 Mr. {Markey.} Especially since the data we are talking
2835 about is like a Frankie Avalon record except it only took 3
2836 years to turn it into completely outdated information that
2837 was totally wrong about where we would be 3 years later--

2838 Mr. {Sieminski.} Congressman Markey, as I was trying to
2839 say earlier--

2840 Mr. {Markey.} Let me just continue. Last year your
2841 agency found that exporting 12 billion cubic feet per day of
2842 natural gas could lead to a 54 percent increase in domestic

2843 prices but today companies are applying to export nearly
2844 three times that amount. It seems to me that before we
2845 permit more natural gas exports to occur, we should have an
2846 understanding of the potential economic impacts on consumers,
2847 on the manufacturing sector and on the transportation sector
2848 in the United States in terms of our own internal domestic
2849 growth in those sectors of our economy and have it based upon
2850 real data, not old data that bears no resemblance to what is
2851 happening in the natural gas sector today.

2852 Now, let me just ask this question. This panel led by
2853 the Republicans voted in 2012 to repeal the ability of EPA to
2854 increase fuel economy standards for the vehicles which we
2855 drive. Let me just go down the line here and just ask each
2856 of you, do you support the repeal of the ability of the EPA
2857 to increase fuel economy standards or do you oppose repealing
2858 the authority? Can we just go down and we will just get your
2859 views on that way in which we deal with oil consumption in
2860 the United States? Mr. Sieminski?

2861 Mr. {Sieminski.} It is not a question for me,
2862 Congressman.

2863 Mr. {Markey.} It is not?

2864 Mr. {Sieminski.} No, it is not. It is a policy issue.

2865 Mr. {Markey.} Okay. Good.

2866 Mr. Yergin?

2867 Mr. {Yergin.} I think fuel efficiency standards are an
2868 important contribution to energy efficiency and our overall
2869 energy mix.

2870 Mr. {Markey.} Thank you.

2871 Ms. {Morgan.} I agree, it is a great example of how you
2872 can meet energy and climate security goals at the same time.

2873 Mr. {Markey.} Thank you.

2874 Ms. {Hutzler.} Well, they are important and certainly
2875 make a difference. You have to take a look at--

2876 Mr. {Markey.} No, just that one issue. One issue,
2877 please.

2878 Ms. {Hutzler.} Well, there are safety issues with
2879 vehicles and other issues that have to be taken into account.

2880 Mr. {Markey.} So you would consider repealing EPA
2881 authority?

2882 Ms. {Hutzler.} I would think that it needs to be
2883 studied and you have to look at the entire situation.

2884 Mr. {Markey.} Yes, sir?

2885 Mr. {Vidas.} I don't want to state any policy opinions
2886 like that, but as a personal consumer of cars, I certainly
2887 like to have more efficient cars.

2888 Mr. {Whitfield.} The gentleman's time is expired.

2889 Mr. {Markey.} Thank you.

2890 Mr. {Whitfield.} At this time I recognize the gentleman

2891 from Illinois, Mr. Kinzinger.

2892 Mr. {Kinzinger.} Thank you, Mr. Chairman, and thank you
2893 all for coming in. Just a couple of questions, and this may
2894 not take all my 5 minutes.

2895 Mr. Yergin, last week's Wall Street Journal, there was
2896 an article titled ``Can Gas Undo Nuclear Power?'' discuss
2897 how low natural gas prices as problematic for our baseload
2898 energy production, and I would like to know your thoughts on
2899 low gas prices as it impacts fuel diversity into the future
2900 and existing domestic resources like nuclear.

2901 Mr. {Yergin.} I think what has happened with natural
2902 gas prices, remember, when people went out to start
2903 developing shale gas, it was--the incentive was very great
2904 for these independents. It was like \$12 and now we know we
2905 are talking around \$3, and that is really changing the
2906 marketplace, the electric power marketplace for everything,
2907 certainly including nuclear.

2908 Mr. {Kinzinger.} So does that give you concerns for
2909 maybe the viability of nuclear in the future if this
2910 continues? And also, what do you think this is going to do?
2911 Do you think in 10 years if you can magically look forward
2912 that we will have a diverse energy supply or do you think we
2913 will maybe kind of too many eggs in one basket?

2914 Mr. {Yergin.} Well, I think it is the--we have four

2915 reactors that are under construction, two projects now. I
2916 think that in this cost environment it is very hard to see
2917 anybody committing to a current generation of new power
2918 plants. The Secretary of Energy Advisory Board, the last
2919 session was partly devoted to small modular nuclear reactors,
2920 in other words, where there is technological innovation. And
2921 I think the other question about our nuclear fleet is, it is
2922 about 20 percent of our electricity. Lives have been
2923 extended. What happens after another 20 year and does that
2924 shrink away then.

2925 Mr. {Kinzinger.} And then another question. You
2926 mentioned my home State of Illinois as a State that already
2927 employs 39,000 people in oil and gas.

2928 Mr. {Yergin.} Well, who are benefiting from the
2929 unconventional oil and gas revolution.

2930 Mr. {Kinzinger.} Right.

2931 Mr. {Yergin.} Although Illinois hasn't yet passed the
2932 regulations.

2933 Mr. {Kinzinger.} No, it is about time we get there.

2934 What would the economic impact be on Illinois if they
2935 allowed oil and gas production, in your mind, as far as new--

2936 Mr. {Yergin.} It would be--it would lead to
2937 considerable generation of income in the State, as we have
2938 seen in other States. Mr. Doyle mentioned it in his State.

2939 And when I was out in Illinois, that day the front page of
2940 USA Today was about how income is shifting, new income is
2941 being created in areas, rural areas, areas that had been
2942 depopulated and so forth because of this activity and kind of
2943 in the center of the State, and the--

2944 Mr. {Kinzinger.} They are the areas that are frankly
2945 suffering sometimes the hardest under this recession, or this
2946 economic difficulty, we will call it, to avoid argument on
2947 it.

2948 Mr. {Yergin.} The new Albany shale could be very
2949 important for the economy of your State.

2950 Mr. {Kinzinger.} And what price do you think natural
2951 gas would need to be in order for production to occur in
2952 Illinois?

2953 Mr. {Yergin.} Well, I think it is really--I mean, I
2954 think people are ready to go ahead. It depends on happens in
2955 Springfield, I think, as to whether it goes ahead or not and
2956 at what--

2957 Mr. {Kinzinger.} I will say Springfield makes
2958 Washington, D.C., look highly functional.

2959 Well, thank you, and I appreciate everybody's testimony.
2960 I appreciate your answering my questions. The big concern
2961 here into the future is, I have always been a believer in
2962 saying you can't have too few energy supplies, and when it

2963 comes specifically to nuclear, I think it is important we
2964 ensure nuclear maintain a major part of our energy portfolio
2965 because in the future you never know how things change.

2966 With that, I want to say thank you. Thank you, Mr.
2967 Chairman. I yield back.

2968 Mr. {Whitfield.} At this time I recognize Mr. Pompeo
2969 from Kansas for 5 minutes.

2970 Mr. {Pompeo.} Thank you, Mr. Chairman, and I thank the
2971 witnesses. It has been a long morning. I think I am hitting
2972 cleanup today.

2973 A couple thoughts. It has been great to listen to. I
2974 have heard words like renaissance and revolution thrown
2975 around and all the good things that are happening. I think
2976 it is worth noting for everyone here, almost all of that
2977 happened with almost zero role of the federal government.
2978 Most of the things that the federal government's resources
2979 have gone to in this intervening period between the hearing
2980 in 2008 and the one in 2013 continue to provide a very, very
2981 negligible set of outputs important to the American economy.
2982 So I think that suggests the direction of travel for us as
2983 well as we think about new policies.

2984 Mr. Yergin, I have got a question for you about
2985 pipelines. Mr. Shimkus talked about it a little bit. You
2986 know, there is an article in Energy Daily talking about how

2987 long it taking for permitting. I would like to introduce

2988 that article into the record if I might, Mr. Chairman.

2989 Mr. {Whitfield.} Without objection.

2990 [The information follows:]

2991 ***** COMMITTEE INSERT *****

|
2992 Mr. {Pompeo.} The study found that nearly 20 percent of
2993 natural gas pipelines have delays of over 6 months or more,
2994 enormous capital at risk when you think about building a new
2995 pipeline, and it is important not only for existing fields to
2996 get those pipelines--the Mississippi shale in my district is
2997 a good example. We have got production but relatively little
2998 demand in towns like Anthony and Coldwater, Kansas. We have
2999 got to this product to the right places.

3000 I think there is also a circular effect, that is, if you
3001 know that you can efficiently build a pipeline, folks will go
3002 look for in other places as well. Can you talk about the
3003 interplay between challenges in building pipelines and
3004 people's willingness to take risks in finding these fields in
3005 North America?

3006 Mr. {Yergin.} Well, Ms. Hutzler spoke about that before
3007 too. I think that getting--the word she used, streamlining
3008 permitting for pipelines. I mean, pipelines are literally a
3009 pretty straightforward thing and that we ought to--that you
3010 need them to keep up with where we are and otherwise you
3011 either are using flaring for gas or you are shipping oil by
3012 truck and so forth and that is not a very efficient way to do
3013 it.

3014 Mr. {Pompeo.} I appreciate that. I am actually--I am

3015 working on some legislation to give FERC a little more
3016 authority in trying to streamline this process. I think it
3017 will be bipartisan. I think we can do this in a way that
3018 provides all the protection for the environment, all the
3019 things we need to do, but getting us to a finish line where
3020 we actually make decisions about these. Whether the pipeline
3021 is a go or a no go, we do it in a much more timely and
3022 reliable fashion.

3023 We talked about energy exports. I was surprised Mr.
3024 Griffith didn't talk about coal exports. We have been
3025 talking about LNG mostly but it is a broad set of energies
3026 that we ought to be exporting from America. Today with
3027 respect to LNG exports, we have a delineation about DOE's
3028 authority, whether we are going to transport this to a free
3029 trade agreement country or a non-free trade agreement
3030 country. I guess this is for anyone on the panel. Is there
3031 any reason for that demarcation to continue to exist?

3032 Mr. {Yergin.} I think it is an artifact.

3033 Mr. {Pompeo.} Yes, that is my sense as well.

3034 Mr. {Yergin.} I mean, Japan, the example I gave, is not
3035 a free trade country and yet it is an incredibly important
3036 country to us.

3037 Mr. {Pompeo.} It seems to me too that there is a
3038 history. I read a little history of how it came to be and it

3039 seems something that we as a policy matter could get rid of.
3040 We could direct those two places for shipment to be treated
3041 identically. I have a few of what DOE's authority ought to
3042 be. I don't think the--I think the national interest finding
3043 is by definition free trade, it creates wealth in America. I
3044 think it is by definition but I am sure others would have a
3045 slightly different view on that but at least we could get rid
3046 of that demarcation.

3047 Ms. Hutzler, I was reading an article about renewable
3048 energy, and in Eastern Europe they subsidized it even longer
3049 than we have and even more than we have, and they have had
3050 some power blackouts. There is an article in Bloomberg on
3051 October 25 that I would also like to submit for the record
3052 that talks about these energy blackouts.

3053 Mr. {Whitfield.} Without objection.

3054 [The information follows:]

3055 ***** COMMITTEE INSERT *****

|
3056 Mr. {Pompeo.} You know, our grid could suffer the same
3057 kinds of things, in my view, if we have non-storable, non-
3058 reliable energy source. Do you have a view of the risk of us
3059 subsidizing this at such a rate that we get to a place where
3060 we have got less reliable electricity in America?

3061 Ms. {Hutzler.} Yes. Germany is a good example because
3062 they are phasing out their nuclear units and turning to
3063 renewable energy in its place, but obviously it has to be
3064 backed up, and it has caused instability to their grid.
3065 Neighboring countries are not allowing them to export their
3066 renewable energy, their wind energy, to them such as Poland,
3067 and in fact, industrial users are seeing some disruptions in
3068 their service that is causing them hundreds of thousands of
3069 dollars in equipment and they have already told the German
3070 government that either you fix this problem or we are going
3071 to leave.

3072 Mr. {Pompeo.} I have got just 20 seconds. Mr.
3073 Sieminski, you talked about renewables growing at a huge
3074 rate. It is easy to grow at a huge rate off a small base. I
3075 remember, I ran a small company at one point too. It is
3076 still not a hugely important part of our energy resource
3077 base. When you made these assumptions about its economic
3078 growth, what did you assume for federal policy? Did you

3079 believe that we would continue our current--somebody on the
3080 other side of the aisle called it creative financing. I will
3081 call it getting in the pockets of taxpayers. But what
3082 assumptions did you make about state RPSs and these kinds of
3083 non-economic policies remaining in effect supporting--

3084 Mr. {Sieminski.} EIA's forecasts always use existing
3085 law and regulation. We don't try to forecast regulation or
3086 law. We do have the California renewable and other laws
3087 built into our forecasts. Renewables go from about 13
3088 percent over the last few years to 16 percent of total
3089 electricity generation, so there is a lot of growth but it is
3090 still a small portion.

3091 Mr. {Pompeo.} Great. Thank you. Thank you, panelists,
3092 all for being here today.

3093 Mr. {Sieminski.} Congressman, I just want to add one
3094 other quick thing if I might, Mr. Chairman.

3095 Mr. {Pompeo.} It is okay with me. My time is up.

3096 Mr. {Sieminski.} Your background in the oil service
3097 industry, a number of questions have come up here this
3098 morning about the impact of hydraulic fracturing and need for
3099 water. In Pennsylvania, I know that most of the flow-back
3100 water is now being recycled and used again, and changes in
3101 technology like the multistage fracturing could lead to much
3102 less water use simply because the identification of where to

3103 frack along a horizontal well could cut the number of feet
3104 that you have to frack in half, and all these things, these
3105 changes in technology are taking place at such a rapid pace.
3106 It is one of the reasons why EIA's forecasts have fallen
3107 short, as Mr. Markey suggested.

3108 Mr. {Pompeo.} Great. Thank you.

3109 Mr. {Whitfield.} Okay. All time is expired, and I want
3110 to thank the panel of witnesses. So thank you all very much.
3111 We will keep the record open for 10 days, and I am asking
3112 unanimous consent to submit into the record a copy of a
3113 statement from National Petroleum Council and also the
3114 executive summary of the IER study on opening federal lands
3115 to oil and gas leasing.

3116 [The information follows:]

3117 ***** COMMITTEE INSERT *****

|
3118 Mr. {Whitfield.} So with that, we will conclude today's
3119 hearing, and once again, I appreciate the participation of
3120 everyone.

3121 [Whereupon, at 1:05 p.m., the Subcommittee was
3122 adjourned.]