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6 A SMARTER INVESTMENT:

7 PATHWAYS TO A CLEAN ENERGY FUTURE

8 THURSDAY, FEBRUARY 18, 2021

9 House of Representatives,

10 Subcommittee on Energy,

11 Committee on Energy and Commerce,

12 Washington, D.C.

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16 The subcommittee met, pursuant to notice, at 11:30 a.m.
17 via Webex, Hon. Bobby Rush [chairman of the subcommittee],
18 presiding.

19 Present: Representatives Rush, Peters, Doyle, McNerney,
20 Tonko, Veasey, Schrier, DeGette, Butterfield, Matsui, Castor,
21 Welch, Schrader, Kuster, Barragan, Blunt Rochester,
22 O'Halleran, Pallone (ex officio); Burgess, Latta, McKinley,
23 Kinzinger, Griffith, Johnson, Bucshon, Walberg, Duncan,
24 Palmer, Lesko, Pence, Armstrong, and Rodgers (ex officio).

25

26 Staff Present: Jeff Carroll, Staff Director; Waverly
27 Gordon, General Counsel; Tiffany Guarascio, Deputy Staff
28 Director; Perry Hamilton, Deputy Chief Clerk; Anne Marie
29 Hirschberger, FERC Detailee; Rick Kessler, Senior Advisor and
30 Staff Director, Energy and Environment; Mackenzie Kuhl, Press
31 Assistant; Jourdan Lewis, Policy Coordinator; Elysa Montfort,
32 Press Secretary; Lino Pena-Martinez, Policy Analyst; Kaitlyn
33 Peel, Digital Director; Medha Surampudy, Professional Staff
34 Member; Tuley Wright, Senior Energy and Environment Policy
35 Advisor; Sarah Burke, Minority Deputy Staff Director; Jerry
36 Couri, Minority Deputy Chief Counsel for Environment; William
37 Clutterbuck, Minority Staff Assistant; Nate Hodson, Minority
38 Staff Director; Peter Kielty, Minority General Counsel; Emily
39 King, Minority Member Services Director; Mary Martin,
40 Minority Chief Counsel, Energy & Environment; Brandon Mooney,
41 Minority Deputy Chief Counsel for Energy; Brannon Rains,
42 Minority Policy Analyst, CPC, Energy, Environment; Peter
43 Spencer, Minority Senior Professional Staff Member, Energy;
44 and Michael Taggart, Minority Policy Director.

45

46 *Mr. Rush. I am going to symbolically gavel the meeting
47 to order. The Subcommittee on Energy will now come to order.

48 I want to thank all of you all for your presence here.
49 Today the subcommittee is holding a hearing entitled, "A
50 Smarter Investment: Pathways to a Clean Energy Future."

51 Due to COVID-19 and this pandemic that we are living in,
52 the public health emergency, today's hearing is being held
53 remotely. Our members and our witnesses will be
54 participating via video conferencing.

55 As part of our hearing, microphones will be set on mute
56 for the purposes of eliminating any and -- any unnecessary --
57 as part of our hearing, microphones will be set on mute for
58 the purposes of eliminating inadvertent background noise.
59 Members and witnesses, you will need to unmute your
60 microphone each time you wish to speak.

61 Documents for the record can be sent to Lino Pena-
62 Martinez in the email address that we provided through staff.
63 All documents will be entered into the record at the
64 conclusion of the hearing.

65 And now, today, in -- the Subcommittee on Energy
66 convenes for its first hearing in the 117th Congress. Before
67 I proceed to beginning the opening statements, I would like
68 to take a moment to welcome to the subcommittee's new
69 majority and minority -- new minority members. I want to
70 take a moment just to welcome our new majority members, and

71 they include Congresswoman Kim Schrier from Washington.

72 Welcome, Kim.

73 She is new to the Energy and Commerce Committee. And 2
74 veterans of the Energy and Commerce Committee, Congresswoman
75 Doris Matsui of California.

76 Wave to us, Doris. That is right.

77 She will be joining with us, and Congresswoman Kathy
78 Castor. Is Kathy on the line? I don't see her on the line.
79 They will both be joining us.

80 *Ms. Castor. Thank you, Mr. Chairman.

81 *Mr. Rush. Thank you. I am pleased to have each of our
82 new majority members on the subcommittee for this Congress.

83 And we also have returning with us our esteemed ranking
84 member, Fred Upton, of the great state of Michigan. And
85 Fred, I am also pleased that you also are rejoining us as the
86 leader of our minority colleagues.

87 And would you at this time like to introduce the
88 minority's new members?

89 *Ms. Castor. Thank you, Mr. Chairman, this is Kathy.
90 Fred Upton is not able to be with us today, so we have Dr.
91 Burgess that is sitting in to serve as the ranking member on
92 the subcommittee. And as far as our new members, I can do a
93 little wing action here.

94 Let's see here, Debbie Lesko from Arizona, new member to
95 the subcommittee; Greg Pence from Indiana, new member to the

96 subcommittee. And the rest of you may need to wave at me
97 here.

98 *Mr. Rush. I think we have Gary Palmer.

99 *Ms. Castor. Gary Palmer.

100 *Mr. Rush. And Debbie Lesko.

101 *Ms. Castor. Yes.

102 *Mr. Rush. Greg Pence.

103 *Ms. Castor. Yes.

104 *Mr. Rush. And Kelly Armstrong.

105 *Ms. Castor. There we go, Kelly Armstrong. I did see
106 him, too.

107 *Mr. Rush. Right.

108 *Ms. Castor. Thank you, Mr. Chairman.

109 *Mr. Rush. That is quite all right. Well, I want to
110 thank you, Chairman -- the ranking member of the full
111 committee. And I will now -- opening -- 5 minutes for an
112 opening statement on my part. I recognize myself for 5
113 minutes for a brief opening statement.

114 In October 2018 the IPCC Panel on Climate Change
115 released a special report on global warming. This report
116 made several things apparent: global emissions are on the
117 rise; changes are necessary before 2030; and, to avoid the
118 harshest consequences of this climate change, we must reduce
119 global emissions to net zero by 2050. Today the subcommittee
120 meets to discuss the reinvigoration of our nation's pathways

121 to a clean energy future toward those very ends.

122 In the year 2018 the energy sector was the second-
123 largest source of U.S. greenhouse gas emissions. This is
124 according to the U.S. Information -- Energy Information
125 Administration in 2019.

126 In the year 2019, approximately 26 percent of the U.S.
127 energy-related CO2 emissions came from mining petroleum
128 fuels; 33 percent came from natural gas; and 21 percent came
129 from burning coal. In the same year, 63 percent of U.S.
130 electricity generation came from fossil fuels.

131 These past trends may seem daunting. However, reports
132 show that a clean energy future is more than possible, and
133 that our progress toward this goal is well underway. For a
134 case in point, renewables will account for most of the new
135 electricity generating capacity for commercial operations in
136 the year 2021. In addition, the cost of clean energy sources
137 like solar power has increased by up to 82 percent since
138 2010, as a result of improved technology and expanding market
139 participation.

140 This month the National Academies released a report on
141 the U.S. energy system. The report emphasizes that achieving
142 net zero carbon emissions in our nation by 2050 is not only
143 feasible, but that it would also bolster the economy,
144 increase the availability of quality jobs, and help address
145 systemic and longstanding social injustices.

146 It also concludes that near-term emission reduction may
147 be achieved by doubling generation from non-carbon-emitting
148 sources, deploying renewables, scaling back coal and some
149 gas, and preserving nuclear and hydroelectric plants.

150 Representatives of the subcommittee, I humbly submit to
151 you that getting the U.S. back in the lead on clean energy is
152 essential for all of us. Yet there are severe consequences
153 to our inaction. Inaction is not an option.

154 Recent manifestation of this includes the
155 disproportionate impact on the coronavirus on communities
156 that shoulder the burden of energy generation, and what is
157 currently happening in the great State of Texas, where many
158 of you reside, also where at least 4.3 million customers have
159 endured frigid -- I must say, Chicago-like -- temperatures
160 without electricity. This is a climate crisis in the State
161 of Texas, and I do intend to have hearings in the future
162 around the failure of our energy center to protect our
163 American citizens in the State of Texas.

164 Members, through our jurisdiction and through our
165 membership, you and I have the tools and we are the team to
166 address these issues and other issues, as well. We
167 demonstrated these -- this same acumen during the 116th
168 Congress by releasing the Clean Future Act, which was a
169 framework to get the U.S. on a path to net zero by 2050.

170 This year we are in pursuit of complementary policies

171 that would increase our overall transmission capacity to
172 support energy security; advance electric vehicle charging;
173 drive diversity and inclusion; and increase clean energy
174 usage by -- via strategies like a clean electricity standard.

175 It has been said that a journey of 1,000 miles begins
176 with the first step. Today, my dear colleagues, I urge the
177 reinvigoration of our march toward a clean center of gravity,
178 and that is to -- and that is we must march forward to a
179 clean, reliable, and secure energy future.

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

181

182 *****COMMITTEE INSERT*****

183

184 *Mr. Rush. And with that, I recognize -- now recognize
185 my friend and colleague, the gentleman from Texas who is the
186 ranking -- acting ranking member of the Energy Subcommittee.

187 I recognize you for 5 minutes for an opening statement,
188 Representative Burgess.

189 *Mr. Burgess. And I thank the chair. And let me just
190 say, starting out, I also want to thank the Denton
191 Independent School District that has provided me one of their
192 offices that has both heat and Internet. So I knew I needed
193 a reliable source of Internet to be a participant in this
194 hearing.

195 And Chairman Rush, it is good to be back with you. Of
196 course, you and I served for 5 terms on the Energy
197 Subcommittee going back to the 119th Congress. I took a
198 brief hiatus, but with the retirement of Representatives
199 Olson and Flores, is it important to have a Texan back on the
200 subcommittee.

201 And your hearing today does occur at a critical time in
202 the nation's history: 5 million American households left
203 without electricity across Oklahoma, Texas, Louisiana, and
204 Arkansas. And we had dangerous record-setting winter
205 weather, which ravaged the entire central United States,
206 blasting sub-freezing Arctic air all the way well south of
207 the Mexican border, and many types of power production across
208 all fuel types were challenged and went offline. People were

209 left stranded. Power outages have lasted for days. Other
210 utility services, particularly water, has also been impacted.
211 Tragically, people have lost their lives.

212 Americans are rightfully angry. Texans are rightfully
213 angry and deserve answers. Given these recent events, it is
214 important -- and I welcome your observation to hold
215 additional hearings, but part of today's hearing should focus
216 on ways to increase the reliability and resilience of our
217 electric grid. This is not a partisan issue. When the
218 temperature drops below zero, no one cares which party the
219 electricity comes from. They just want the heat to come on,
220 the lights to go on when they flip the switch.

221 As we know, Texas leads the nation in renewable power.
222 It has transitioned faster than any other state. Congress
223 needs to gather facts and understand the root causes of this
224 energy crisis before speeding ahead with new renewable
225 mandates that shift away from more reliable components of the
226 existing energy fleet.

227 In recent years the energy sector has done a rapid
228 transformation and reduced our dependence on foreign energy.
229 And that is so critically important, and people forget that.
230 And it has helped rescue us from the 2008 economic recession,
231 and lowered our nation's emissions. This revolution was not
232 produced alone by federal spending and mandates, but instead
233 created by America's spirit of innovation and our nation's

234 dynamic free market economy. Transformation has brought many
235 benefits to our nation, including -- but those benefits do
236 not eclipse the importance of a stable supply of energy for
237 all Americans.

238 Investments are made in new energy production and energy
239 infrastructure, but the reliability of those systems must
240 always be the priority. Unfortunately, some of the early
241 actions of this Administration cancelling pipelines,
242 prohibiting new energy production on federal lands signaled
243 the desire to go in the opposite direction.

244 And let me just remind my colleagues that America leads
245 the world in reducing its carbon emissions. And some of us
246 are still around who sat through the markup of the 2009
247 Waxman-Markey climate bill. But in fact, we have reduced
248 emissions through market forces greater than what would have
249 been reduced if Waxman and Markey's bill had been signed into
250 law. So let's not forget the actions that have been produced
251 by the free market, and they will reduce our nation's -- they
252 -- if we don't pay attention to that we will reduce our
253 nation's energy resiliency, and hurt our energy workers
254 without any significant impact to global emissions.

255 Look, Chairman Rush, you are correct to say that America
256 deserves a cleaner energy future, but pursuing a path toward
257 that future while ignoring energy reliability may be the
258 wrong approach. This subcommittee, this subcommittee should

259 work together to prioritize the reliability of our power
260 sector. We can pursue methods of expediting clean, American-
261 made energy products, but we must remove barriers to slowing
262 down innovation and creating jobs to provide affordable
263 energy at home for America's -- for Americans at home. Our
264 energy sector stands ready to meet those challenges, but we
265 can't let the heavy hand of government become an additional
266 obstacle.

267 Look, we have got significant work ahead of this
268 Congress. We can look to America's clean energy future, but
269 we cannot afford to rapidly transition our energy system
270 without assurance of its reliability. We cannot support
271 policies that destroy entire industries or increase America's
272 dependence on foreign sources of energy and critical
273 minerals. I hope we can find a bipartisan consensus and keep
274 those priorities in mind.

275 [The prepared statement of Mr. Burgess follows:]

276

277 *****COMMITTEE INSERT*****

278

279 *Mr. Burgess. And Mr. Rush, I would also ask unanimous
280 consent -- in my research for this hearing I came across a
281 Scientific American article that talked about the 2003
282 northeast blackout 5 years later. And interesting in this
283 look-back article, they referenced the Energy Policy Act of
284 2005, which many of us will remember, that created some
285 additional resiliency because of the challenges to the
286 northeast grid that happened during that summer. And of
287 course, we all recall that many lives were lost to the
288 extreme heat conditions, and we can't forget that heat can be
289 just as deadly as cold if Americans are unprepared.

290 But again, Mr. Chairman, I will get this -- have my
291 staff get this to your staff, but I would ask unanimous
292 consent to include it as part of the record, and I will yield
293 back.

294 *Mr. Rush. The gentleman yields back.

295 Are there any objections?

296 Hearing no objections, so ordered.

297 [The information follows:]

298

299 *****COMMITTEE INSERT*****

300

301 *Mr. Rush. The chairman now recognizes the chairman of
302 the committee, Mr. Pallone, for 5 minutes.

303 *The Chairman. Thank you, Mr. Chairman.

304 Today the energy subcommittee begins its work for this
305 Congress renewing our efforts to chart a path to a clean
306 energy future. Last Congress was particularly productive for
307 the subcommittee, culminating in enactment of the Energy Act
308 of 2020. And I commend Chairman Rush, along with many others
309 from both sides of the aisle, for their work on this new law
310 that was included in the omnibus.

311 Last year Chairmen Rush, Tonko, and I released a draft
312 of the Clean Future Act, comprehensive climate legislation to
313 get us to a 100-percent clean economy by 2050. In the coming
314 weeks we plan to introduce an updated version of the Clean
315 Future Act that will serve as the basis for comprehensive
316 climate action this year.

317 The Clean Future Act touches on the whole energy
318 economy, from the power sector to buildings to
319 transportation, all aspects we will explore at today's
320 hearing. The bill includes a federal Clean Electricity
321 Standard, or a CES, a policy that has long existed in many
322 states. A national CES can play a key role in building a
323 clean power sector, which is critical to reducing carbon
324 emissions in other economic sectors. And the Clean Future
325 Act also sets forth policies to drastically reduce energy

326 consumption in the building, transportation, and industrial
327 sectors, among others.

328 Now, President Biden has made the climate crisis a
329 centerpiece of his Administration, and has already taken bold
330 actions to address climate change. I stand ready to work
331 with him to enact comprehensive climate legislation, and I
332 hope my Republican colleagues will join us in that effort.

333 Now, as we discuss the climate crisis, it is important
334 to also recognize the effects of the COVID-19 pandemic. Last
335 Congress this subcommittee held a hearing on the impacts of
336 the pandemic on the energy sector, including job loss,
337 delayed projects, and the effect of pandemic restrictions on
338 energy demand. Pandemic-related job losses have also
339 resulted in millions of households being unable to pay their
340 utility bills, and that is why the reconciliation
341 instructions our committee marked up last week included
342 additional funding for the Low-Income Home Energy Assistance
343 Program, or LIHEAP. And LIHEAP helps the growing number of
344 qualifying families pay their utility bills, and is
345 especially crucial during a pandemic.

346 And last, it is critical that we discuss the devastating
347 toll this week's severe winter weather is taking on our
348 nation. Millions are facing power outages and dangerously
349 cold conditions, and these outages are further exacerbated by
350 the COVID-19 pandemic.

351 Now, earlier this week the energy market in Texas, known
352 as ERCOT, was forced to take 34,000 megawatts of electricity
353 generation off the system. And since Sunday evening, over
354 25,000 megawatts of mostly fossil-fueled energy were offline.
355 Of this number, most of those outages are at gas-fired power
356 plants.

357 Those are the facts, as stated by Texas's own regulator.
358 Yet some Republicans and media outlets are suggesting
359 alternative realities. They are turning a crisis into an
360 anti-renewables campaign, and they are conveniently leaving
361 out the fact that the majority of the failures have come from
362 fossil fuel. So we can't allow the Texas crisis to be used
363 as an excuse to discourage movement towards renewables. That
364 will not help Texas or the United States.

365 What failed here was an energy sector that didn't
366 consider fully our changing climate and the extreme weather
367 that comes with it. It was a failure to fully recognize that
368 the 100-year-old storm of yesterday may now be the 10-year
369 storm of today. As both the Department of Energy and fossil
370 generation companies reported yesterday, gas pipelines,
371 wells, and plants all froze because they weren't equipped to
372 handle the cold weather.

373 But I agree -- I heard what Dr. Burgess said, and I
374 agree that we need to do more in terms of resiliency. And
375 certainly the bill that we are hoping -- an infrastructure

376 bill that we are hoping we will be doing, similar or maybe
377 even more expansive than the Moving Forward Act that we
378 passed last year in the Congress and through this committee,
379 will be an opportunity for us to address some of these
380 resiliency issues, as well. And those things are also
381 included in our Clean Future Act.

382 But I do think that the severely limited interconnection
383 between ERCOT and the rest of the country probably didn't
384 help matters, either. I think it is sad that we saw these
385 problems arise 10 years ago with another major storm that hit
386 Texas and the Southwest, and the Federal Energy Regulatory
387 Commission at the time issued a report, but nothing really
388 changed. You know, the fact that Texas is almost like an
389 island separated from the rest of the nation's energy grids I
390 don't think helps, because it is more difficult for us to get
391 power to them in the time of crisis. So hopefully we won't
392 ignore this last FERC report, and we will follow up on it.

393 And I also want to stress that this committee will
394 investigate the Texas crisis further, and we will see what
395 other actions we have to take based on that oil report, as
396 well as what we find out now. So ultimately, this episode
397 underscores the importance of prioritizing clean and
398 resilient energy infrastructure, which is exactly what we aim
399 to do with this.

400 So thank you again. I yield back.

401 [The prepared statement of The Chairman follows:]

402

403 *****COMMITTEE INSERT*****

404

405 *Mr. Rush. The gentleman yields back. The chair now
406 recognizes the ranking member, Mrs. McMorris Rodgers, for 5
407 minutes.

408 *Mrs. Rodgers. Thank you, Mr. Chairman. And I want to
409 thank Dr. Burgess for the extra effort to sit in the lead
410 Republican chair today. He is certainly at the right place
411 at the right time for this hearing. Texas has the lowest
412 energy cost in the country, along with the fastest transition
413 to clean energy.

414 With that, let's recognize that there is many good ideas
415 for developing cleaner energy systems to ensure that we win
416 the future. The key is to recognize how we unleash American
417 innovation and free enterprise using all our resources to
418 protect our economic and energy security. We should build,
419 not destroy. We should use our abundant natural resources
420 like hydrogen and natural gas, not shutter them. We should
421 enable people to deploy, take risks, improve, and create the
422 next great advances so America leads a new era of
423 entrepreneurship and innovation.

424 We can pursue practical policies to innovate a cleaner
425 energy future if we work together. We should be clear-eyed
426 about what is at stake if we get this wrong.

427 The radical environmental left is pushing top-down, one-
428 size-fits-all mandates and costs on Americans, which will
429 threaten our nation's energy dominance and our national

430 security. This is clear in the repeated attacks on our oil
431 and natural gas industry and its people, which has provided
432 tremendous opportunity and given the advances -- has actually
433 driven the advances in cleaner energy generation that are
434 benefitting all around the globe. Yet the left is rejecting
435 fossil energy, while also talking about transforming
436 America's electricity system in 14 years, and the entire
437 energy economy in 30 years.

438 How is that possible? What does this transformation
439 really mean for our economy? What does it mean for families
440 and workers? We should look beyond the rhetoric to
441 understand what this is really about, and we should
442 understand the consequences on energy, reliability, household
443 cost, and security.

444 The importance of reliability has been on full, heart-
445 wrenching display this week in Texas, the South, and the
446 Midwest. At times available electricity could not meet the
447 record-high demand for power from the extreme cold. Wind
448 turbines across the state froze. Natural gas production was
449 shut in. This ultimately deprived the grid of critical
450 energy and power, just as the demand spiked. There wasn't
451 enough natural gas supply or baseload generation to close the
452 gap, especially because of other weather issues and emergency
453 priorities to heat homes and hospitals.

454 On Monday, to prevent more widespread power failure, the

455 Texas grid operator, ERCOT, directed utilities to implement
456 outages that eventually affected an estimated 5 million
457 households. The emergency exposed systematic weaknesses
458 relating in part to over-reliance on intermittent renewables.
459 It is a powerful reminder that electricity reliability is a
460 life-and-death matter.

461 The supply of energy also is a serious pocketbook
462 matter, especially for low-income households. Low and
463 middle-income families must be top of mind if this discussion
464 turns to new, clean energy mandates and taxes. Especially
465 during the pandemic recovery families cannot afford an
466 increase in their electricity and gasoline bills.

467 According to the Department of Energy, states with the
468 highest low-income energy burdens, 10 percent or higher, are
469 in the Southeast. For mostly heating and cooling, low-income
470 households use about 36 percent more power than the national
471 average for low-income households in other regions of our
472 country. Fortunately, states like my home state of
473 Washington also enjoy some of the lowest electricity rates in
474 the nation, thanks to our hydropower.

475 But imagine how families will be squeezed if top-down
476 energy policies increase the price of electricity. What
477 happens when people in Mississippi, Alabama, Georgia, or
478 South Carolina have to pay the same rates as people in
479 California or Connecticut?

480 And then there is economic and national security. The
481 rush to green seeks to ban fossil energy and its quality jobs
482 for millions of people. It will massively increase reliance
483 on renewables and electrification of transportation. This
484 domestic policy has global implications.

485 First, it won't do much to reduce global emissions. The
486 global emissions will keep going up as developed nations seek
487 access to affordable energy.

488 It will also hurt America's security and competitive
489 edge. Absent major changes in our domestic mining and
490 manufacturing base, increasing reliance on wind, solar, and
491 electric batteries trades energy security for energy
492 insecurity. It pushes carbon emissions offshore, and
493 increases reliance on Chinese supply chains. It does nothing
494 meaningful for global climate change.

495 We can do better, and I hope that we all begin to pay
496 attention to what is really at stake: reliability, jobs,
497 affordability, and our nation's economic security.

498 I yield back.

499 [The prepared statement of Mrs. Rodgers follows:]

500

501 *****COMMITTEE INSERT*****

502

503 *Mr. Rush. The gentlelady yields back. The chair would
504 like to remind members that, pursuant to committee rules, all
505 members' written opening statements shall be made part of the
506 hearing record.

507 Now I would like to welcome our esteemed witnesses for
508 today's hearing.

509 The first witness is Dr. Stephen Pacala, who is the
510 president (sic) of ecology and evolutionary biology at
511 Princeton University.

512 Our next witness is Ms. Paula Glover, a friend who is
513 the president of the Alliance to Save Energy.

514 The next witness is Mr. Craig Gordon, the senior vice
515 president of global affairs (sic) at Invenergy.

516 The next is Mr. Richard Powell, the executive director
517 at ClearPath, Incorporated.

518 And finally, last but not least, Mr. David (sic) Camp
519 III, who is the chairman of the Beaver County Commissioners.

520 I want to thank each and every one of our witnesses for
521 being with us today. I must say that our witness -- we have
522 -- one of our witnesses have a -- 1:00 -- a 2:45 hard stop.
523 So we want to be mindful of this hard stop for our witness as
524 we go forward.

525 And to all of our witnesses this morning, we look
526 forward to your testimony.

527 And now we begin with Dr. Pacala.

528 You are recognized for 5 minutes for an opening
529 statement.
530

531 STATEMENT OF STEPHEN W. PACALA, PROFESSOR OF ECOLOGY AND
532 EVOLUTIONARY BIOLOGY, PRINCETON UNIVERSITY; PAULA R. GLOVER,
533 PRESIDENT, ALLIANCE TO SAVE ENERGY; CRAIG GORDON, SENIOR VICE
534 PRESIDENT, GOVERNMENT AFFAIRS, INVENERGY; RICHARD J. POWELL,
535 EXECUTIVE DIRECTOR, CLEARPATH, INC.; AND DANIEL C. CAMP, III,
536 CHAIRMAN, BEAVER COUNTY COMMISSIONERS

537

538 STATEMENT OF STEPHEN W. PACALA

539

540 *Dr. Pacala. Thank you, Mr. Chairman, for this
541 invitation to provide testimony. I am here as chairman of
542 the National Academies committee that released a report on
543 February 2nd that Chairman Rush just mentioned, containing
544 policies that would, over the next 10 years, put the U.S. on
545 a 30-year path to net zero greenhouse gas emissions.

546 The committee was asked to determine how to achieve net
547 zero, but importantly, not whether or not the nation should
548 do so. The committee was instructed to provide both the
549 technological blueprint for the transition to net zero and a
550 portfolio of socio-economic policies to ensure that the
551 transition is fair and just.

552 The first of 2 reports covers CO2 emissions from
553 electric power, transportation, industry, buildings, and
554 fuels, but not agricultural and forestry carbon sinks, nor
555 non-CO2 greenhouse gases that will be covered in the second.

556 It covers only federal actions over the first 10 years of the
557 30-year transition.

558 Lessons learned in a comprehensive review of existing
559 information include, first, that the transition is
560 affordable. The nation would spend a similar or lower
561 fraction of GDP on energy during the transition than it has
562 over the past 30 years because of the dramatic drop in the
563 cost of wind, solar, and lithium ion batteries.

564 The transition would save lives. Medical savings during
565 the 2020s would be larger than the costs.

566 The transition would create more than a million new net
567 jobs, but fossil jobs would decline.

568 The energy system today contains substantial injustice.
569 Poor and historically marginalized groups suffer
570 disproportionate harm from fossil pollution, while receiving
571 disproportionately low benefits from fossil energy.

572 Past transitions have left legacy workers and
573 infrastructure behind. If we do that again, and if we do not
574 work to eliminate existing environmental injustice, then
575 prohibitive public opposition is likely to develop.

576 The report identifies technological goals with
577 quantitative targets, including a doubling of the share of
578 net zero electricity, increased electrification of transport
579 and home heating, and new infrastructure such as electrical
580 transmission lines and CO2 pipelines.

581 It also identifies socio-economic goals, including
582 revitalizing the manufacturing sector, cost-effectiveness,
583 increasing high-quality jobs, promoting equity, diversity,
584 and inclusion, and fair treatment of communities, businesses,
585 and workers during the transition.

586 The policy recommendations are summarized in a single
587 table, which is in the testimony. The table offers the
588 quickest way to assimilate and understand what the report
589 recommends. Recommendations include an economy-wide price on
590 emissions starting at \$40 per ton, a green bank, and
591 standards to ensure an on-schedule transition, including
592 zero-emissions electric power and vehicle standards.

593 The report calls for regulatory reforms in the
594 electricity sector, without which net zero power goals are
595 unlikely to be realized.

596 It recommends a tripling of federal net zero RD&D.

597 It is the first report containing a comprehensive policy
598 portfolio designed from scratch to address the social
599 dimensions of the energy transition. This includes a
600 national transition task force to identify workers and
601 communities at risk, regional centers where state and local
602 leaders can learn about what is coming and how to manage it,
603 community block grants for local planning, and an independent
604 national transition corporation that would provide funding to
605 address social impacts of the transition, and a comprehensive

606 education and training program.

607 Some might be tempted to view policies targeting
608 deployment of net zero technology as the highest priorities,
609 because the social consequences would lag behind deployment.
610 However, this view has it backwards, because the
611 technological transition and the social disruption that goes
612 with it are already occurring, and will inevitably continue.
613 The ongoing decline in coal sector employment is already
614 hollowing out communities across the nation. The recent
615 announcement by General Motors that it will produce only
616 electric cars by 2035 is a harbinger of similar inevitable
617 declines in oil and gas employment.

618 In conclusion, a transition to a net zero economy in the
619 United States by mid century is technologically feasible with
620 energy system costs that have been manageable in the recent
621 past. With appropriate policy, the transition could advance
622 a number of national objectives simultaneously: a more fair
623 and just energy system; improved international
624 competitiveness; revitalized American manufacturing; and
625 enhanced energy innovation.

626 The transition would also provide new, high-quality
627 jobs, but at the cost of lost fossil jobs; eliminate the
628 substantial health impacts of fossil fuels; reduce U.S.
629 greenhouse gas emissions to zero; and enhance the nation's
630 leadership in climate and energy.

631 Thank you.

632 [The prepared statement of Dr. Pacala follows:]

633

634 *****COMMITTEE INSERT*****

635

636 *Mr. Rush. The gentleman -- opening statement. The
637 chair now recognizes Ms. Paula Glover, the president of the
638 Alliance to Save Energy.

639 Paula, it is so good to see you again. And you are
640 recognized for 5 minutes.

641

642 STATEMENT OF PAULA R. GLOVER

643

644 *Ms. Glover. Thank you, Chairman. Thank you and good
645 afternoon, Chairman Rush, Chairman Pallone, Ranking Member
646 McMorris Rodgers, and Dr. Burgess, for holding this hearing.

647 A clean energy future that works for everyone is going
648 to require careful planning. And we all appreciate your
649 leadership. Certainly I do. I want to recognize the members
650 of this committee who also serve on the Alliance's honorary
651 board: Chairman Rush, Representatives Tonko, Welch, Dr.
652 Burgess, Representative McKinley, and Kinzinger. I started
653 with the Alliance just about a month ago, and I am really
654 looking forward to working with all of you.

655 I also want to just send my thoughts out to those folks
656 in Texas, my friends, my colleagues, and all of those
657 individuals and members of my family who are really going
658 through a very tough time, and just want them to know that we
659 are all thinking and praying about them.

660 I am going to start by saying, you know, there has been
661 a lot of back and forth recently about the risks and
662 opportunities of the clean energy transition. And I actually
663 believe that it boils down to one essential question: How do
664 we handle and tackle the climate crisis in a way that uplifts
665 every community?

666 How do we avoid leaving future generations the costs and

667 life-threatening dangers of climate change, while at the same
668 time making sure we are not increasing energy costs or
669 leaving communities behind?

670 We can't make this transition fair unless we are
671 thinking of the communities that could be harmed in the
672 process, as well as the communities that have already been
673 harmed, communities where history tells us we need to do so
674 much better at providing clean air, economic opportunity, and
675 more affordable energy.

676 And if I leave you with one thought with my testimony
677 today, I hope it is that energy efficiency is the most
678 powerful answer we have for addressing this challenge. And I
679 would argue that energy efficiency should be the starting
680 point in the conversation about an equitable, clean energy
681 transition.

682 We can start with jobs. Energy efficiency is often
683 overlooked as one of the largest employers in the entire
684 energy economy. Even after losing more than 300,000 jobs
685 during this -- since this pandemic began, efficiency employs
686 more than 2 million Americans. That is about 7 times the
687 amount of wind and solar industries combined, and more than
688 10 times the size of the coal workforce.

689 Energy efficiency jobs are spread all over the country,
690 they are construction workers and HVAC contractors who
691 retrofit homes and buildings. They are factory workers

692 making windows and insulation. They are electricians and
693 plumbers and, increasingly, tech workers designing or
694 installing digital controls and systems to manage energy
695 demand. These are the type of jobs that will be created if
696 we launch a national campaign to modernize our infrastructure
697 by retrofitting millions of homes and buildings, creating a
698 more efficient transportation system, and cleaning up our
699 industrial sector.

700 It is an incredible opportunity to create durable,
701 skilled trade jobs that pay good wages, and that are
702 available in 99 percent of U.S. counties. And if we do it
703 right, we can ensure that those opportunities are available
704 first for the communities that need them the most, whether it
705 is a rural town in West Virginia, or an urban neighborhood in
706 Illinois.

707 And at the same time, we have to carefully consider
708 energy affordability. I started my career more than 30 years
709 ago taking payments in a gas utility. And I know firsthand
710 about the energy burden that many families deal with. In
711 fact, 1 in 5 U.S. households today have -- find themselves
712 making a choice at least once a year between paying their
713 energy bill, food -- or buying food and medicine. And I
714 can't begin to imagine what that must be like.

715 I am not here to tell you that energy efficiency is
716 going to make that burden disappear. But what it can do is

717 deliver hundreds of dollars in lower bills and savings that
718 can make the difference for some families. And that cost
719 savings is not just for consumers. Energy efficiency
720 improvements can cut costs and increase profits for small
721 businesses and manufacturing plants, making them more
722 productive and competitive.

723 Finally, we have a pressing need to address climate
724 change. When it comes to greenhouse gas emissions, energy
725 efficiency is simply the fastest, cheapest, and most
726 effective solution we have. The International Energy Agency
727 projects that energy efficiency using existing technologies
728 will account for nearly half of the emission reductions
729 needed to meet the goals of the Paris Agreement.

730 So what do we need to do to achieve these goals? I am
731 going to highlight several policy solutions under this
732 committee's jurisdiction, and we urge you at the Alliance to
733 consider them as you develop infrastructure and clean energy
734 legislation this year.

735 First, we have been working with Representative Welch
736 and others -- thank you, Congressman -- to develop a new
737 program for helping small businesses improve their efficiency
738 with an emphasis on boosting minority-owned businesses and
739 businesses in disadvantages -- disadvantaged communities.
740 This plan for Main Street efficiency would target federal
741 grants to match existing utility programs to provide low and

742 no-cost efficiency upgrades to small businesses immediately
743 and permanently, lowering their operating expenses. Since 80
744 percent of energy efficiency contractors are small businesses
745 themselves, this is a small business helping small
746 businesses.

747 We also strongly support a proposal championed by
748 Representative Blunt Rochester -- thank you, Congresswoman --
749 to retrofit mission-critical public buildings around the
750 country -- our schools, hospitals, airports, and other
751 facilities -- not just to be more efficient, but also to be
752 safer and more resilient in the face of natural disasters and
753 other emergencies. This proposal would leverage federal
754 funding to draw billions in private capital through
755 performance contracting and other financing and, importantly,
756 ensure that at least 40 percent of the projects are in low-
757 income or disadvantaged communities.

758 We also strongly support expanding core efficiency
759 programs at the U.S. Department of Energy, particularly the
760 weatherization assistance program. I would emphasize that
761 all these proposals, because they are so tailored to creating
762 jobs, go hand in hand with improved worker training programs.

763 We support Chairman Rush's longstanding workforce
764 legislation, the Blue Collar and Green Collar Jobs Act,
765 because that ensures that everyone seeking a skilled position
766 can get one.

767 In addition, while not under your jurisdiction, we also
768 are looking at tax incentives that will help us grow our --
769 grow efficiency improvements in our homes and buildings. I
770 believe efficiency is a foundational solution to the
771 challenges that you are trying to address. And we at the
772 Alliance are looking forward, and we are eager to working
773 with you to find the best solutions for all of our
774 communities. Thank you.

775 [The prepared statement of Ms. Glover follows:]

776

777 *****COMMITTEE INSERT*****

778

779 *Mr. Rush. Thank you, Ms. Glover. The chair now
780 recognizes Mr. Gordon.

781 Mr. Gordon, you are recognized for 5 minutes.

782

783 STATEMENT OF CRAIG GORDON

784

785 *Mr. Gordon. Thank you, Subcommittee Chairman Rush, Mr.
786 Chairman Pallone, Ranking Member Rodgers, and Acting Member
787 Burgess for inviting me to participate in today's hearing.
788 My name is Craig Gordon, and I am senior vice president of
789 government affairs at Invenergy.

790 Invenergy is a privately-held clean energy company that
791 develops, owns, and operates large-scale renewables, gas-
792 fired generation, as well as energy storage and electric
793 transmission. Starting with just 6 employees in 2001,
794 Invenergy will employ more than 1,500 employees by the end of
795 the year. Invenergy has developed 175 utility-scale clean
796 energy projects, with the capacity of over 27,000 megawatts,
797 and has completed more than 40 billion in project financings.
798 We focus on renewables because, as our CEO, Michael Polsky,
799 loves to say, it just makes sense.

800 Before I begin my testimony, I would like to briefly
801 address the recent reliability issues in Texas and
802 neighboring states. These events underscore the importance
803 of your work to ensure a reliable and affordable grid as the
804 realities of climate change are hitting us in unexpected
805 ways.

806 On behalf of Invenergy I want to say that we are deeply
807 troubled and saddened by the events that have unfolded. The

808 system failed in Texas for 2 reasons: first, because the
809 market and the resources themselves were not designed to
810 sustain such extreme cold weather -- wind, gas, coal, and
811 nuclear operations were all disrupted -- no single resource
812 type bears all the blame; second, since Texas is electrically
813 isolated from the rest of the grid, available generation
814 elsewhere could not be imported to address the shortfall.

815 Even now, as the crisis in Texas and elsewhere
816 continues, the real investigations into what went wrong
817 haven't even begun. But the recommendations I made in the
818 file testimony already point to the path forward. They were
819 true before the disaster hit, and they are painfully true
820 today.

821 First, transmission. There is simply no way to achieve
822 the ambitions of this Administration and the American people
823 without more of it. Higher penetrations of renewables
824 throughout the country require a massive investment in
825 transmission infrastructure. Transmission connecting diverse
826 regions of the country and different types of technologies
827 with complementary generation profiles is key to solving this
828 challenge.

829 Second, long-term energy policy. Without a national
830 policy to direct the country toward a decarbonized grid, we
831 will only make incremental progress. And without a long-term
832 approach, the industry will not be able to plan for projects

833 and infrastructure across the multi-year development and
834 supply chain timelines that are required for these huge
835 investments. A patchwork of state policies has filled the
836 void of a federal policy so far, but real progress has been
837 limited because every state does it differently. An
838 overarching goal would align all states and help address
839 thorny issues.

840 Additionally, there are several other policies that
841 aren't squarely under the jurisdiction of this committee that
842 are critical to meeting these goals.

843 First, Congress should consider policies that allow for
844 monetization of energy tax credits at 100 percent of their
845 value to address the tightening tax equity market.

846 Second, Congress should consider federal incentives like
847 an investment tax credit for transmission to unlock
848 renewables and improve reliability of the grid.

849 Third, Congress should increase resources and develop
850 advanced technologies to ensure the long-term compatibility
851 of renewable energy and our national security.

852 The transition to a decarbonized grid will create
853 significant socio-economic benefits. For example, we create
854 good-paying jobs in rural and historically disadvantaged
855 communities. Invenergy invests in training and STEM programs
856 to produce the next generation of workers and communities we
857 serve. Approximately 10 percent of Invenergy's employees are

858 veterans, and we continue to recruit from that great talent
859 pool.

860 In addition to job benefits, the affordable, emissions-
861 free power that our industry generates can help alleviate
862 environmental burdens, especially in low-income areas, or
863 those most susceptible to harmful environmental impacts.
864 Indeed, a thoughtful expansion of clean energy can contribute
865 to a just transition in an equitable, clean-energy economy.

866 The urgency with which we must all tackle this challenge
867 has never been greater. Fortunately, we have the tools to do
868 so. The path to achieving our goals is not mysterious.
869 Transmission is as core to the economy of the future as the
870 highway system is to interstate commerce today. What we have
871 before us is a once-in-a-lifetime opportunity to tackle the
872 most existential threat modern mankind has ever faced. And
873 we must, because it just makes sense.

874 Thank you again for the opportunity to address this
875 subcommittee.

876 [The prepared statement of Mr. Gordon follows:]

877

878 *****COMMITTEE INSERT*****

879

880 *Mr. Rush. I want to thank you. Our next witness is

881 Mr. Powell.

882 Mr. Powell, you are recognized for 5 minutes.

883

884 STATEMENT OF RICHARD J. POWELL

885

886 *Mr. Powell. Good afternoon, and thank you, Chairmen
887 Rush and Pallone, Dr. Burgess, and Ranking Member McMorris
888 Rodgers, and members of the committee. I lead ClearPath. We
889 advance policies that accelerate clean energy and industrial
890 innovation. An important note: we receive no industry
891 funding.

892 As I stated the last time I had the honor to address
893 this committee, climate change is an urgent challenge that
894 merits significant policy action at every level of government
895 and the private sector. We need look no further than Texas
896 and across the Midwest to see the havoc extreme weather can
897 have on the energy system. As America creates the grids of
898 the future, we must utilize all forms of clean energy to
899 ensure reliability.

900 As this committee considers its part in U.S. climate and
901 clean energy policies, those solutions should be ambitious,
902 but also technology inclusive, politically realistic, and
903 pragmatic. Policies must also support U.S. jobs.

904 Too often solutions are oversimplified to a set of false
905 choices: renewable versus fossil; economy versus
906 environment; immediate action versus inaction. The reality
907 is solutions to make the global clean energy transition
908 cheaper, faster, and more flexible.

909 Policy proposals must also reflect the global nature of
910 the challenge. A molecule of CO2 emitted in Shanghai has the
911 same impact as one released in Chicago. Policies like fuel
912 switching, shutting down traditional energy production, or
913 simply subsidizing certain technologies will do little to
914 impact global emissions, and may lead to loss of American
915 jobs. A more effective strategy is rooted in American clean
916 energy abundance, innovation, and exports.

917 Today I will, first, level-set on where we are today;
918 second, discuss policy to achieve a clean power future
919 affordably and reliably; and third, look at options to reduce
920 U.S. industrial emissions.

921 So where are we today? Emissions are significantly
922 down. Retail electricity prices have been flat, helping
923 manufacturing jobs come back to America. Returning these
924 jobs is also leading to lower global emissions because our
925 environmental standards are tougher than China's. America's
926 largest electric utilities, including Southern Company, Xcel
927 Energy, Duke Energy, and DTE have committed to reaching net
928 zero emissions by 2050. Sixty-eight percent of the country
929 is now served by a utility with a significant carbon goal.

930 But these utilities have emphasized that many of the
931 24/7 clean technologies required to get them to that zero are
932 not commercially available today. Xcel Energy said, even
933 with their first-rate access to wind and sun, existing

934 technology is sufficient to reach only 80 percent clean. We
935 need policies to enable technologies that can eliminate the
936 final 20 to 50 percent of power sector emissions.

937 According to the International Energy Agency, only 2 of
938 14 critical power technologies are on track to deploy. We
939 recommend that policymakers now work with industry, not
940 against them. The Energy Act of 2020 is a perfect example.
941 The most significant energy legislation in over a decade,
942 your new law lays the foundation for a comprehensive
943 commercialization strategy that focuses the world-class
944 American innovation engine on these key technologies. It
945 includes more than 20 major new demonstration programs for
946 long duration storage, carbon capture, advanced nuclear,
947 geothermal, and direct air capture. It also expands DoE's
948 work in industrial emissions and hydrogen.

949 We congratulate you on the Energy Act, and now we must
950 look to implementation. Ensuring accountability at DoE and
951 appropriately investing so your legislative success goes from
952 letters in law to clean steel in the ground.

953 Now, getting it built. We have all heard the Biden
954 Administration's mission to build back better. But right now
955 we can only build new clean energy and reduce CO2 emissions
956 as fast as we can permit new projects. The mission ought to
957 be to build cleaner faster. Currently, the federal
958 permitting process can take 5 to 10 years to complete, and

959 cost millions of dollars. The good news, your colleagues
960 have introduced a number of proposals to modernize.

961 Lastly, financing. Large-scale energy innovation needs
962 to bring together private and public investment to scale up
963 deployment and bring down costs. At the end of 2020 and
964 early this year, you hit a policy trifecta for carbon
965 capture, new aggressive R&D authorizations, a carbon capture
966 tax credit, 45Q extension, and final administrative rules on
967 how developers can properly claim the credit. While 45Q was
968 a major victory, we also need a better structure for helping
969 incentivize big investments and driving down costs. The
970 Energy Sector Innovation Credit would update the energy
971 portion of the tax code by allowing cutting-edge technologies
972 to gain commercial viability.

973 Now, our power sector work has been that the U.S. will
974 not meaningfully reduce emissions without more clean and
975 affordable technologies. This is even truer in the
976 industrial sectors. More than 10 million hardworking
977 Americans are employed there, and ensuring those jobs stay in
978 America must remain a priority. Energy-intensive, trade-
979 exposed industries like steel-making absolutely require
980 affordable new technologies to help them decarbonize.
981 Without them, we risk not only losing essential U.S. jobs,
982 but leaking the industrial activity to countries with worse
983 emissions, like China, effectively increasing the risks of

984 climate change.

985 A serious debate on climate solutions must include a
986 dose of political and technical realism. Climate change is
987 an urgent problem that must be addressed today. It is
988 imperative for all sides to agree that building cleaner
989 energy in America will rebound our economy from COVID-19,
990 create jobs, and have a significant global impact.

991 Thank you for this opportunity. I look forward to the
992 discussion.

993 [The prepared statement of Mr. Powell follows:]

994

995 *****COMMITTEE INSERT*****

996

997 [Pause.]

998 *Voice. You may need to unmute.

999 [Pause.]

1000 *Mr. Rush. Mr. Camp, you are now recognized for 5
1001 minutes.

1002

1003 STATEMENT OF DANIEL C. CAMP, III

1004

1005 *Mr. Camp. Thank you. Good afternoon, Chairman,
1006 Majority Chairman Rush, Dr. Burgess, Chairman Pallone,
1007 Ranking Member McMorris Rodgers. I want to thank you for
1008 having me be part of today's important hearing.

1009 As Chairman Rush said, my name is Daniel Camp. I
1010 currently serve as the chairman of the Beaver County Board of
1011 Commissioners.

1012 Beaver County and most of Pittsburgh Region's affinity
1013 and strong endorsement for the energy sector isn't tied to a
1014 common political ideology, because the support crosses
1015 political boundaries. The energy sector support can't be
1016 limited to one particular generation, because many Boomers,
1017 Millennials, and those in between living in Western
1018 Pennsylvania are supportive of our energy sector in Western
1019 PA. In my opinion, our support of the energy sector can be,
1020 in large part, due to the family-sustaining jobs they have
1021 been providing for many years.

1022 Therefore, policy -- tax through increased taxes,
1023 regulation, and diverse rhetoric against certain types of
1024 producers within the energy sector are justifiably seen as
1025 personal attacks by those working within those specific
1026 sectors, as well as the businesses benefitting those workers
1027 and their families.

1028 Ultimately, if these attacks are achieved through new
1029 public policy, they are risking these workers having the
1030 ability to pay their mortgage and pay their own utility
1031 bills. Please just think about that when you are considering
1032 this. The desire for some policymakers to kill a particular
1033 industry and to invoke punitive policies against that
1034 industry alone will impact folks in my area in a way that
1035 jeopardizes their ability to put a roof over their family's
1036 heads and continue to keep food on their tables.

1037 The reality of this is that hundreds of thousands of
1038 people, many working in our trade unions in Western PA, rely
1039 on the natural gas industry's ability to produce natural gas
1040 in the Marcellus and Utica shales. And thousands of moms and
1041 dads rely on CONSOL Bailey's mine to provide for their
1042 children each and every month. Combine those jobs with
1043 downstream jobs whose survival directly depends on those
1044 energy sources being readily available and affordable -- yes,
1045 in Beaver County that includes Shell's petrochemical
1046 multibillion ethylene cracker plant.

1047 But let's be reminded, Shell is the fourth largest
1048 company in the world. I am not going to sit here today and
1049 argue that they can't afford to pay higher prices for their
1050 feedstock. But I know small manufacturing companies that
1051 can't afford the same price increases, nor have the Capex
1052 dollars to retrofit their plants to an alternative energy

1053 source.

1054 The manufacturing sector has been -- has seen a
1055 resurgence recently, because of the affordability and readily
1056 available energy resources that we have here. As you know,
1057 regulations that increase the cost of energy production, even
1058 on large companies like Shell, EQT, Chevron will certainly be
1059 passed down the supply chain and ultimately be paid by their
1060 vendors, and even their customers. That means truck drivers,
1061 food workers, local union workers, power plants, and even
1062 homeowners will incur those higher costs, too.

1063 Many of these small regional companies that can't afford
1064 those increases -- the situation in Western Pennsylvania and
1065 our support for all energy sources can be summarized by
1066 looking at the employment statistics.

1067 Now, I am aware that some people and groups will distort
1068 statistics to fit their agenda. But that is not my reason
1069 for being here today. I am merely here to give my personal
1070 observation about reasons behind why so many people that I
1071 represent support this energy sector in Pennsylvania. That
1072 is the natural gas industry supports almost 24,000
1073 production-related jobs.

1074 Pennsylvania jobs are specifically attributed to the
1075 natural gas industry's total 106,000 people, and an
1076 outstanding 323,000 jobs are supported solely by that
1077 industry. The petroleum and oil industry, almost 24,000 jobs

1078 associated with production alone. Combine natural gas and
1079 oil, \$23 billion in wages for Pennsylvanians. The coal
1080 industry directly supports more than 10,000 jobs. Nuclear,
1081 5,000-plus indirect jobs. Wind and solar combined for 8,000,
1082 and hydro, 400.

1083 There may be other others who testify that certain types
1084 of energy have done -- have done wonderful things for their
1085 local economies and communities. But the reality today is
1086 that some have not had the same impact as the energy sector.
1087 And therefore, the support for those others are very
1088 proportional.

1089 I thank you for your time, and I look forward to
1090 answering any questions. Again, thank you.

1091 [The prepared statement of Mr. Camp follows:]

1092

1093 *****COMMITTEE INSERT*****

1094

1095 *Mr. Rush. I want to thank the witness. And we have
1096 now completed all the opening statements for the witnesses,
1097 and we will now move to member questions. Each member will
1098 have 5 minutes to ask questions of our witnesses. And I will
1099 start by recognizing myself for 5 minutes.

1100 A component of the National Academies report on
1101 decarbonization involves the elimination of inequities in the
1102 current energy system that already severely disadvantage the
1103 disenfranchised. In the coming days I intend to introduce a
1104 bill to establish a Department of Energy office to advance
1105 principles of energy equity and all the conditions and
1106 resources to that very end.

1107 Dr. Pacala, I want to ask you. What else must we do to
1108 eliminate the inequities of the current energy system, while
1109 creating, at the same time, a clean energy future?

1110 [No response.]

1111 *Mr. Rush. Dr. Pacala? Will you unmute, Dr. Pacala?
1112 You are muted.

1113 [No response.]

1114 *Mr. Rush. Can you hear me? Dr. Pacala?

1115 [No response.]

1116 *Mr. Rush. Dr. Pacala?

1117 [No response.]

1118 *Dr. Pacala. Can you hear me now?

1119 *Mr. Rush. Yes, we hear you now, Dr. Pacala.

1120 *Dr. Pacala. Okay, sorry. The system was -- we have a
1121 big storm going here, and I think the wires are blowing
1122 around. It would not unmute.

1123 *Mr. Rush. All right.

1124 *Dr. Pacala. So our report -- the committee included
1125 experts in environmental justice, and experts on the social
1126 consequences of technological transitions and what to do
1127 about it.

1128 The -- as a -- for a climate and energy person like me,
1129 it was a real education to learn how much inequity is built
1130 into our current energy system, with disproportionate health
1131 exposure to fossil pollutants in communities of color and
1132 low-income workers across the country, how much energy prices
1133 contribute to poverty, how unavailable the kinds of
1134 opportunities that we afford people, like tax credits for
1135 electric cars are to low-income communities who lack capital,
1136 and how difficult it is for low-income communities often to
1137 take advantage of federal programs that do exist because, for
1138 instance, their homes can be noncompliant with codes.

1139 So we recommended a sort of an integrated portfolio to
1140 address the ongoing energy injustice, and forward-looking to
1141 have the transition itself also be fair and just, because
1142 workers are -- some communities and workers would be
1143 otherwise damaged. This starts with a task force, a national
1144 task force to map where the energy injustice is in the

1145 country. There are good sector-specific studies, but nothing
1146 comprehensive. So we need first a top-down look at this.

1147 And then we have an integrated program of a White House
1148 office to coordinate 10 regional centers where
1149 representatives and mayors and others can get together to
1150 learn what can be done and to plan a national transition
1151 corporation that works with a green bank to provide capital,
1152 community block grants, so that they can plan and then apply
1153 for projects; a DoE extension service to provide technical
1154 know-how; a comprehensive education and training program;
1155 additional fundings in -- funding in LIHEAP and the
1156 Weatherization Assistance Program.

1157 And so, in combination, the -- this package is designed
1158 to provide workers with multiple options during the
1159 transition, and to protect communities that would lose a
1160 dominant employer, and to eliminate the injustice that we
1161 have built into the energy system to date.

1162 *Mr. Rush. All right, thank you. I have -- my time is
1163 almost out, according to the clock, although I think that the
1164 -- well, let me just yield back the balance of my time.

1165 And now the chair recognizes the chairman of the full
1166 committee, Mr. Pallone, for 5 minutes.

1167 [Pause.]

1168 *Mr. Rush. Frank, you got to unmute, Frank.

1169 *Mr. Burgess. So, Mr. Chairman?

1170 *Mr. Rush. Yes?

1171 *Mr. Burgess. This is Burgess.

1172 *Mr. Rush. Oh, Mr. Burgess.

1173 *Mr. Burgess. Sometimes we go to the acting ranking
1174 member --

1175 *Mr. Rush. Yes, absolutely. My error. Please forgive
1176 me.

1177 *Mr. Burgess. Well, don't --

1178 *Mr. Rush. You are now recognized, the acting ranking
1179 member of the subcommittee, my friend, Dr. Burgess, for 5
1180 minutes.

1181 *Mr. Burgess. Thank you, Chairman Rush.

1182 And Ms. Glover, welcome to you. I have been on your
1183 board for some time, and I have always believed that energy
1184 efficiency is the common ground that we probably can find
1185 between all of the disparate political philosophies that
1186 weigh in on these energy questions.

1187 And I will just tell you my own experience with energy
1188 efficiency has really taught me just exactly what you are
1189 saying, that you can achieve 40 percent or greater reductions
1190 in your energy consumption. So if we look at it just from
1191 the standpoint of the consumer, by making wise choices with
1192 energy efficiency, whether it be in retrofitting a home, a
1193 new build, or even just a selection of particular appliances
1194 or products, you -- your group does bring a wealth of

1195 expertise and knowledge and a significant voice to the
1196 discussion. So I thank you for being here today.

1197 I do an energy efficiency summit every non-COVID year in
1198 my district, and I find it to be very well attended, and
1199 people are actually hungry for the type of information that
1200 you provide.

1201 *Ms. Glover. Thank you, Dr. Burgess.

1202 *Mr. Burgess. And Mr. Rush, I think too, you know, in
1203 the future, we would do well to include Ms. Glover in future
1204 discussions because energy efficiency sometimes just kind of
1205 gets pushed to the side. But it is one of the most readily
1206 available to the end energy consumer -- a way that they have
1207 of impacting their energy purchases.

1208 Mr. Powell, thank you for being on our group today.
1209 Thanks for your testimony. Can you just -- you did a very
1210 great job in your written testimony providing information
1211 about grid reliability. So the changing of the energy
1212 sector, I would infer from that that you believe has weakened
1213 our energy reliability.

1214 *Dr. Pacala. Can you hear me?

1215 *Mr. Burgess. Yes.

1216 *Dr. Pacala. Okay, good. Well, so our committee didn't
1217 investigate whether or not there has been any short-term
1218 decrease in grid reliability. What we did was to focus on
1219 how to decarbonize the grid and maintain its high

1220 reliability. And this is, of course, technologically
1221 feasible. The key, of course, is to have not just -- is to
1222 have firm sources of power that can be relied upon at any
1223 time. As we have seen in Texas, when the firm sources of
1224 power fail, you are in trouble.

1225 And also it is important to -- transmission, because you
1226 can interconnect areas from, you know, areas where demand is
1227 lower than average to areas where demand is higher than
1228 average.

1229 So the -- I want to be very clear that it is possible to
1230 build a net zero electricity grid that is as reliable as the
1231 grid we have today, or as the grid that we had 10 years ago.

1232 *Mr. Burgess. So if I may, I got notice over the
1233 weekend -- I believe it was on Saturday -- that ERCOT was
1234 buying power from Mexico and Southwest Power Pool. I presume
1235 that that was a price phenomenon, rather than a weather
1236 phenomenon. But obviously, those sources were closed off as
1237 soon as it got cold in those neighborhoods, as well. But
1238 ERCOT is not an entirely closed system. There are inputs and
1239 there are egresses into other parts of the grid.

1240 Mr. Gordon, I wonder if I might ask you: You operate
1241 wind turbines in Texas, is that correct?

1242 *Mr. Gordon. Yes, sir, that is correct.

1243 *Mr. Burgess. And you also operate natural gas
1244 facilities in Texas, is that correct?

1245 *Mr. Gordon. That is correct.

1246 *Mr. Burgess. Can you speak to the overall impact on
1247 the reliability of both of those as energy sources?

1248 *Mr. Gordon. Yes. So I think, to answer your question,
1249 Congressman Burgess, we saw an unprecedented weather event
1250 hit Texas over the last week, which included significant
1251 icing on wind turbines. Our wind turbines are designed for
1252 cold-weather operation, so our turbine operations weren't
1253 impacted by the temperature so much as they were by
1254 significant icing. So we had icing, you know, for several
1255 days, and our technicians had worked around the clock to try
1256 to, you know, get the icing -- so they can resume operations.

1257 On our natural gas facility we have a peaking plant in
1258 Ector County, and we were unable to procure gas for the plant
1259 over the sustained time of this event. So our inability to
1260 get gas prevented us from operating. I think what our
1261 experience was is consistent with what other gas generators
1262 experienced, as well. Because our facility did not have dual
1263 fuel, we weren't able to operate. Had, you know, an ERCOT
1264 system been designed to pay for capacity as other systems do,
1265 our facility could have had dual fuel capabilities. But
1266 there is just no compensating that right now to do that.

1267 *Mr. Burgess. Right. There has actually been a move
1268 away from dual fuel capabilities for some number of years.

1269 And although -- and I am going to yield back. And I can

1270 appreciate that it is an unprecedented -- but, you know, this
1271 happened in 2011, the same situation occurred, it just didn't
1272 last as long. So -- and I remember Governor Perry's response
1273 to that was to recommend the construction of several new coal
1274 power plants to sort of bolster the energy grid in Texas. He
1275 was rebuffed in that by the mayors of Dallas and Houston, who
1276 did not want to see new coal generation built in Texas. Some
1277 redundancy, clearly, is necessary.

1278 But thank you, Mr. Rush, I will yield back my time.

1279 *Mr. Rush. The gentleman yields back. And now that we
1280 return to regular order, I will now yield 5 minutes to the
1281 chairman of the full committee, Mr. Pallone, for 5 minutes
1282 for questioning.

1283 Mr. Pallone, you are recognized.

1284 *The Chairman. I will unmute myself. Thank you,
1285 Chairman Rush.

1286 I am trying very hard today and in the future to have us
1287 move towards a collective, you know, bipartisan response to
1288 the climate crisis. I mentioned our Clean Future Act, which
1289 has been introduced, but I also want the Republican members
1290 to understand that, if at all possible, we would like to see
1291 a bipartisan response to the climate crisis.

1292 And I am concerned today, starting with the governor of
1293 Texas, that, you know, that somehow renewables are being
1294 blamed for this, what happened in Texas, or the suggestion is

1295 being made that we shouldn't move towards -- you know, not
1296 necessarily by members of this committee, but the suggestion
1297 is being made that this should be some reason for us to stop
1298 moving towards a clean energy future, or not encouraging
1299 renewables.

1300 And, you know, I really wish that we could avoid that,
1301 because I do think that renewables have to be a major part of
1302 this. It is not to say that we are going to rule out fossil
1303 fuels, or gas, or hydroelectric -- which is, actually, a
1304 renewable, hydro is a renewable. So I don't know. I just
1305 you know, I don't want this devastating situation in Texas to
1306 be blamed on renewables, because I just think that is false.
1307 The blame lies in the failure to properly consider how
1308 climate change and extreme weather events impact the grid.

1309 And the answer, as Dr. Burgess said, is to move towards
1310 more resiliency with the grid and other -- and also
1311 resiliency for, you know, for power lines and gas lines and
1312 everything else, as well as looking towards the issue of
1313 whether or not it may -- you know, there should be more
1314 interplay between the Texas grid and the grids in the other
1315 part of the country.

1316 So let me just ask Mr. Gordon. Based on recent
1317 statements from ERCOT, it appears that, although 12,000
1318 megawatts of wind and solar did go offline, the region was
1319 only expecting to rely upon 2,800 megawatts of wind this

1320 winter to meet energy demand. Meanwhile, ERCOT lost well
1321 over 25,000 megawatts of thermal generation, much of it
1322 natural gas, that it was relying on to meet the winter energy
1323 demand.

1324 So, again, I am not trying to get into this, but I think
1325 that the suggestion is being made that renewables are the
1326 cause of this power crisis. But it is not -- I want you to
1327 comment. I mean, is it fair to say that the failure to
1328 ensure a reliable natural gas supply was a major cause of the
1329 outages that we are now facing, as compared to any failure of
1330 renewables, if you will?

1331 *Mr. Gordon. Thank you, Chairman. I guess, to answer
1332 your question, again, we don't want to cast aspersions on any
1333 particular type of technology, either. Having said that,
1334 wind, as everyone knows, is naturally variable, and it goes
1335 up and it goes down hour by hour, day by day. And, as ERCOT
1336 has noted, wind, as a portfolio in the system, actually
1337 outperformed day-ahead expectations.

1338 So when all things were considered, wind did better than
1339 ERCOT's own system operators expected it to. And, as for
1340 what happened to the natural gas supply system, I really
1341 don't have insight into what happened there, other than I
1342 suppose it was too cold for gas to flow.

1343 *The Chairman. But I mean, right now, I mean, ERCOT was
1344 much more dependent on the natural gas generation to meet the

1345 winter energy demand. I mean, there is no question of that.
1346 I mean, that is just a fact, correct?

1347 *Mr. Gordon. That is true. I mean, ERCOT has coal and
1348 nuclear and natural gas and wind, and all work in concert
1349 with each other. They are economically dispatched, and we
1350 don't run more gas than we need to when the wind is up, and
1351 we expect -- and ERCOT knows that gas will be available when
1352 the wind is down. It is, you know, how the system has
1353 operated pretty much flawlessly for a decade.

1354 *The Chairman. Right. But, you know, my concern is --
1355 I don't know if you want to answer this, but -- maybe I will
1356 just say it, that, look, the bottom line is that Texas was
1357 not prepared for this. You know, gas pipelines in Texas are
1358 not, you know, insulated the way they are in the Northeast.
1359 The bottom line is that Texas and all of us had to prepare
1360 for these extreme weather events. And more must be done
1361 across the board, whether it is -- you know, whether it is
1362 coal powered, gas, wind, whatever it is.

1363 I just don't think it is fair to suggest that somehow
1364 wind was the real problem here, or that renewables were a
1365 real problem here. I mean, they don't even rely on those
1366 that much in the winter. And -- but if you don't want to
1367 comment on that, you don't have to. If you want to, go
1368 ahead, you have got 10 seconds.

1369 *Mr. Gordon. Okay, yes. I mean, I think wind is a --

1370 is often the whipping boy of the energy industry. So we are
1371 kind of used to it. But it is unfair, and it is untrue. If
1372 we had more infrastructure, transmission infrastructure, this
1373 could have been avoided.

1374 *The Chairman. All right. Thank you very much, Mr.
1375 Gordon.

1376 Thank you, Mr. Chairman.

1377 *Mr. Rush. The chair now recognizes the ranking member,
1378 Mrs. McMorris Rodgers.

1379 *Mrs. Rodgers. Thank you, Mr. Chairman, and I want to
1380 start just by saying to the chairman of the full committee,
1381 Mr. Pallone, that I appreciate you saying that you would like
1382 to work with us, Republicans and Democrats, to move to the
1383 clean energy future. We would welcome that. We would love
1384 to work together on innovation and removing regulatory
1385 barriers to more clean energy.

1386 Our concern is really when American energy resources,
1387 whether it is pipelines like Keystone, are cancelled with the
1388 stroke of a pen, or other executive orders are removing
1389 American energy resources and fuel sources, and really
1390 impacting America's leadership and our future that is
1391 important to our economy, as well as our national security.

1392 But I want you to know we stand ready to work together.
1393 And I think these are important discussions that we are
1394 having.

1395 I appreciated -- Mr. Powell, I liked your theme about
1396 build cleaner faster. So I would like to explore that a
1397 little bit more with you, because we had testimony in the
1398 Environment Subcommittee last week that highlighted a serious
1399 problem: 90 percent of solar panels are imported; 80 percent
1400 of the key components for wind turbines are imported. Asian
1401 companies dominate global battery production, and account for
1402 80 percent of all planned factories. China also dominates
1403 critical minerals, it supplies 90 percent of the rare earth
1404 minerals. And China right now is announcing that they will
1405 allow the banning of exports of strategic minerals to
1406 companies and nations that are considered a national security
1407 threat. That is a problem.

1408 So today, we -- you know, we continue to hear this
1409 drumbeat of building out the wind and the solar energy, and
1410 restricting the oil and natural gas development. This is on
1411 a collision course. And what that means is that we are going
1412 to be losing our hard-earned energy independence, and become
1413 reliable on these vulnerable supply chains from countries
1414 like China, or will be offshoring our emissions to nations
1415 with lower standards. So that is no help for the climate,
1416 and it will harm our own security.

1417 So, Mr. Powell, I wanted to start -- because I don't
1418 think that this is an acceptable path for American
1419 leadership, and for us to win the future. So would you just

1420 comment on how you believe the United States should focus on
1421 building on our own strengths, our -- and ensure that we have
1422 a secure energy supply, and that we are also addressing
1423 global emissions?

1424 *Mr. Powell. Absolutely. Thank you so much, Ranking
1425 Member McMorris Rodgers. Let me congratulate you again on
1426 your election to the ranking membership of the committee.
1427 And thank you for your leadership on the Energy Act of 2020,
1428 and so much of your support for hydropower policy -- I know
1429 an issue we have talked about many times before -- and energy
1430 innovation, broadly.

1431 You know, I think that there is a couple of components
1432 to this, on retaking American leadership on clean energy,
1433 both domestically, here in the United States and, even more
1434 importantly, exports. I think that begins with innovation.

1435 We have fallen behind in domestic ownership and domestic
1436 manufacturing on a number of key clean energy technologies
1437 and a number of the components of those technologies. We
1438 need to focus on a next generation of technologies, where we
1439 can retake leadership. We still have a chance to lead in
1440 advanced nuclear energy, and long-duration storage, in carbon
1441 capture technologies that can use the natural fossil fuel
1442 abundance we have the United States, but do it in a cleaner
1443 and cleaner way every year. We can lead on advanced
1444 geothermal technology.

1445 And we can do more to ensure that there are strong and
1446 robust domestic supply chains for critical minerals. That
1447 means opening up mining resources for critical minerals here
1448 in the United States, and using innovation to find more
1449 earth-abundant substitutes for those materials. We don't
1450 necessarily have to use exactly the same mix of materials and
1451 elements that we have used so far, and that have made us
1452 quite dependent on China and other nations with very poor
1453 labor standards like the Democratic Republic of Congo, for
1454 example. We can find substitutes for a lot of those
1455 materials that are more available either here in the United
1456 States or in our allied countries. So I think --

1457 *Mrs. Rodgers. Great.

1458 *Mr. Powell. -- innovation, opening up exploration, and
1459 finding alternatives.

1460 *Mrs. Rodgers. In just these last few seconds, would
1461 you comment on the prospects of nuclear technology -- because
1462 there is some exciting technology being developed in
1463 Washington State -- and if it would help overcome the
1464 transmission problem that we are seeing even in Texas right
1465 now?

1466 *Mr. Powell. Absolutely. As I think everyone has said,
1467 no technology was unscathed in Texas. But I think nuclear
1468 did probably a little better than average in Texas. Only one
1469 of the nuclear units, to my understanding, went down.

1470 Nuclear is a highly resilient part of any clean energy mix,
1471 of any energy mix, and I think that we can find even more
1472 resilient and even more advanced designs for nuclear.

1473 I am extremely excited about the 2 designs that are
1474 likely to be piloted and demonstrated in Washington State in
1475 the coming 5 years. That is part of the advanced reactor
1476 demonstration program started in the previous Administration
1477 at the Department of Energy that is going to set up 2
1478 commercial-scale, fully commercialized -- it is like selling
1479 electricity to the grid, demonstrations of advanced reactor
1480 technologies. These are the next generation. They don't use
1481 water to cool them. They have a number of different
1482 attributes that make them cheaper and more efficient, and
1483 potentially offering the same safety for a significantly
1484 lower cost profile. So I am very excited about those
1485 developments, and I hope Congress will support them.

1486 *Mrs. Rodgers. Thank you.

1487 And thank you, Mr. Chairman. I yield back.

1488 [Pause.]

1489 *Mr. Rush. The gentlelady yields back. The chair now
1490 recognizes Mr. Peters for 5 minutes.

1491 *Mr. Peters. Thank you, Mr. Chairman. Thanks for
1492 having this fascinating hearing. And I want to start on
1493 behalf of the residents of San Diego, California, by
1494 expressing our concern and prayers for the tremendous

1495 challenges facing the folks in Texas and nearby areas. I
1496 commit to working with you to find out the facts behind what
1497 is -- what has gone wrong, and honestly figure out the ways
1498 that the federal government can play a role in ensuring
1499 reliability.

1500 I also want to acknowledge that the transition to cheap
1501 natural gas has lowered carbon dioxide emissions. But
1502 because this has become a talking point in this committee, I
1503 want to again remind everyone that if we don't control
1504 fugitive methane emissions along the way from production to
1505 end use, there is no climate benefit.

1506 And if I had more time, I would also like to explore the
1507 carbon tax with Dr. Pacala, as his report touts the
1508 advantages of pairing well-designed carbon tax -- and by that
1509 I mean one that can mitigate the negative distributional
1510 impacts on society -- with other ambitious climate policies.
1511 But I will defer that for our discussion of how we pay for
1512 infrastructure investment, because I think that matches that
1513 well.

1514 Today I want to use my time to talk about transmission.
1515 It is widely acknowledged that the national power grid needs
1516 to be modernized to make it more secure, resilient, and
1517 efficient. It also needs to be interstate. The United
1518 States has tremendous renewable energy resources that have
1519 not been -- not yet been tapped. But often these resources -

1520 - sun, wind, geothermal, hydropower -- are in remote or rural
1521 areas.

1522 According to research from the Department of Energy's
1523 National Renewable Energy Lab, if we connect centers of high
1524 renewable resources with centers of high electric demand by
1525 building a macrogrid -- that is an overlay of high voltage DC
1526 lines -- and optimize that grid for the nation's best wind
1527 and solar, we can dramatically reduce carbon emissions, while
1528 improving system resiliency and reducing wholesale power
1529 costs. A macrogrid will enable more robust and more
1530 competitive wholesale power markets, which translates to
1531 lower costs for consumers. One model shows consumers saving
1532 \$42 billion annually by building HVDC transmission, allowing
1533 power to flow across the seams between electricity regions.

1534 And one more point about U.S. competitiveness. The
1535 Brattle Group estimates that the U.S. electric industry needs
1536 200 gigawatts of new transmission capacity in order to
1537 accommodate widespread electrification. China has already
1538 done this and more. By the end of 2021 China will have
1539 developed over 250 gigawatts of new interregional
1540 transmission capacity over the last 7 periods -- last 7-year
1541 period. In contrast, we, the United States, have added 3.
1542 We need 200; we have added 3. So clearly, the scale of the
1543 challenge is significant, just as clearly the current
1544 regulatory environment hampers our collective ability to meet

1545 this challenge.

1546 So I want to ask a question first to Ms. Glover. It
1547 certainly hasn't been for lack of trying. Why is it so
1548 difficult for us to build large-scale transmission projects
1549 across state lines? And what role does Congress have to play
1550 in removing the barriers, once and for all?

1551 And then -- Ms. Glover and then maybe Mr. Gordon.

1552 *Ms. Glover. Thank you, Congressman. I am not sure
1553 that I am the best person to respond to your question,
1554 because my focus typically isn't on the building of
1555 transmission lines. So I will yield that time to someone who
1556 is more suited, if you don't mind. But I would welcome an
1557 opportunity to kind of do some research on the Alliance's
1558 position and get back to you.

1559 *Mr. Peters. That is great. Mr. Gordon?

1560 *Mr. Gordon. Yes, Congressman, thank you for the
1561 question.

1562 Invenergy, historically, has been developing wind,
1563 solar, thermal resources. And right now it sees the need for
1564 long-distance, high-voltage transmission, really, to connect
1565 the windiest parts of the country that don't have any real
1566 electric connectivity to deliver the best wind to where the
1567 load centers are.

1568 So we stepped into a project that had been in
1569 development for nearly a decade. And these projects take a

1570 long time. It is an 800-mile line project from southwest
1571 Kansas that would ultimately go through Missouri and
1572 Illinois, and terminate just across the Indiana border, and
1573 would carry upwards of 4,000 megawatts of clean, renewable
1574 power. The interesting thing about this line in the context
1575 of the hearing today is it would be designed so they could
1576 carry power in both directions, as needed.

1577 *Mr. Peters. Right, right.

1578 *Mr. Gordon. So if we have an abundance of wind --

1579 *Mr. Peters. Right.

1580 *Mr. Gordon. -- normally in southwest Kansas, we could
1581 take it all the way to the eastern part of the grid.

1582 *Mr. Peters. Can I just add Mr. Powell -- or from Mr.
1583 Powell -- I don't know, I am going to run out of time -- but
1584 ERCOT itself explained in its comments to FERC that many ISOs
1585 and RTOs said that large-scale transmission is the key to
1586 resilience: "One of the most critical elements" -- this is
1587 ERCOT --- "of system resilience is ensuring that the
1588 transmission system is planned in a way to ensure continued
1589 operations following an unexpected outage of one or more
1590 generators or transmission elements."

1591 Mr. Powell, you have 5 seconds to react to that.

1592 *Mr. Powell. Well, thank you very much, Congressman
1593 Peters. Thank you for your leadership on all these issues.

1594 In that short amount of time I will -- you know, I will

1595 -- as Dr. Burgess noted, ERCOT is not entirely an island.
1596 There is transmission that interconnects it with the rest of
1597 the grid. I think every observer of this, you know, would
1598 note that more transmission probably would be helpful here,
1599 if there were larger, better interconnections to --
1600 particularly on the east and west, there may have been an
1601 opportunity to bring in more resources.

1602 Obviously, there are cost implications to that. And it
1603 has been, as you noted, devilishly difficult to site and
1604 permit those new wires. So I think we need to figure out
1605 both the regulatory and permitting issues that would enable
1606 that, and figure out how to pay for those and maintain a --
1607 you know, affordability in the local power supply.

1608 *Mr. Peters. Mr. Chairman, my time has expired, but I
1609 do see an opportunity to work with Mrs. Rodgers on regulatory
1610 relief on this issue, in particular, and I yield back.

1611 [Pause.]

1612 *Mr. Rush. The chair recognizes Mr. Latta for 5
1613 minutes.

1614 *Mr. Latta. Well, thanks, Mr. Chairman, and thanks very
1615 much for holding today's hearing, and thanks for our
1616 witnesses for being with us today.

1617 Also I want to express my thoughts and prayers for the
1618 folks down in Texas for everything that they are going
1619 through from this about once-in-a-century winter storm, and

1620 that, you know, we want to do everything we possibly can. We
1621 are committed to making sure that we get the assistance to
1622 them.

1623 Mr. Chairman, we can continue to work with the private
1624 sector to promote job creation, innovation, and emissions
1625 reduction, and energy security by embracing a diverse
1626 portfolio of domestic energy sources, or we can pursue a top-
1627 down, heavy-handed government policy that can destroy our
1628 economy, put millions of Americans out of work, and stifle
1629 innovation through onerous bureaucratic red tape. And
1630 unfortunately, what we have been seeing so far is that the
1631 Biden-Harris Administration is going to take that second
1632 path.

1633 If I could start with Commissioner Camp, and as a former
1634 county commissioner myself here in Wood County, you know, you
1635 have spoken previously to the committee about the benefits
1636 that your county has experienced because of these energy
1637 projects. Could you go into more detail? I know you did
1638 some in your opening statement about that, but could you go
1639 into more detail about the types of program investments that
1640 Beaver County has made -- been able to make because of this
1641 revenue stream that you have gotten?

1642 *Mr. Camp. Thank you, Congressman. Absolutely. I had
1643 the honor to testify in 2019 to the Subcommittee on
1644 Environmental and Climate Change to discuss the petrochemical

1645 plant that we were able to land here in Beaver County in
1646 2016. We are -- on the process, they are still at the time
1647 to be finished here very soon.

1648 We have seen tremendous investments from, not only Shell
1649 Petrochemical, but the downstream organizations who are here
1650 in Beaver County and the southwestern Pennsylvania region
1651 through the infrastructure, the highways, center township.
1652 My home community has been granted a new water treatment
1653 facility with 100-year span. Our community college has been
1654 donated millions of dollars for a process technology lab,
1655 where -- we have these companies who are starting to invest
1656 into our community because they are going to be calling it
1657 their home.

1658 Not only are they investing in our higher education,
1659 they are also investing in our minority communities, who are
1660 not capable of the technology -- through their investments,
1661 because of the global pandemic here, we are capable of having
1662 these schools now have classes online.

1663 So we are seeing a great deal of investment, not only
1664 through Shell, but through all the other companies who are
1665 downstream jobs of Shell, who are now planting their feet in
1666 the ground.

1667 *Mr. Latta. Well, thanks very much, Commissioner, for
1668 your leadership in the county.

1669 Mr. Powell, if I could go to a follow-up on some

1670 questions that our Republican leader was talking about on the
1671 nuclear side, how can Congress and the new Administration
1672 build on the achievements of the Energy Act of 2020 to
1673 accelerate the development and deployment of the domestic
1674 fuel supply for advanced nuclear companies?

1675 *Mr. Powell. Thank you very much, Congressman Latta.
1676 Thank you for your leadership on this issue, and your
1677 legislation around creating a reserve of HALEU fuel.

1678 Just to take a step back, on advanced nuclear there are
1679 a couple of components to getting this up and running.

1680 Component one is to demonstrate the technologies, to
1681 actually show the world, show utilities, show potential
1682 industrial users that it is real, that it could actually
1683 work.

1684 Step two is making sure that we have the fuel to run the
1685 things, because they run on higher-test fuel, or high-assay,
1686 low-enriched uranium. Currently we don't have a supply of
1687 HALEU fuel in the United States, and we need to establish a
1688 reserve for one of those.

1689 And then we need to start actually building a robust
1690 supply chain for that HALEU fuel here in the country.

1691 And then last, we probably need some deployment
1692 incentives to provide the early financing, which would bring
1693 those technologies into the market, just as so many other
1694 technologies have had those early incentives.

1695 And so I think we can work on all of those things.
1696 There could be appropriations and oversight of the Department
1697 of Energy to make sure those demonstrations work. There can
1698 be legislation like yours, to establish programs to set up a
1699 HALEU reserve and a robust supply of this fuel. And there
1700 could be new incentives created like the Energy Sector
1701 Innovation Credit that would provide incentives to pull these
1702 things into the market.

1703 *Mr. Latta. Well, thank you. Let me ask real quick in
1704 my few seconds remaining, just to follow up, because, again,
1705 I am really worried about rare earth minerals. And you were
1706 also talking about finding other elements that could be a
1707 substitute. Can we do that on our own in this country,
1708 without having to rely on countries that don't like us?

1709 *Mr. Powell. I sure hope so, because, as was noted
1710 previously, I worry that those countries may shut off the
1711 supply to these technologies, or threaten to shut off the
1712 supply to these minerals and resources whenever we get into
1713 areas of geopolitical tension. I think this needs to be a
1714 top priority for both our private sector and for our
1715 innovators at the national labs and other research
1716 institutions, and finding ways to get around this.

1717 I am very excited about some of the developments in
1718 earth-abundant battery chemicals, even an organic battery
1719 chemical, so it would basically take things like organic

1720 chemicals -- think like sugars and fats -- and be using those
1721 as the way that we would store huge amounts of energy in new
1722 batteries and storage systems. So I think that there is a
1723 lot of potential here, but it needs to be adequately
1724 resourced at the research stage.

1725 *Mr. Latta. Thank you very much.

1726 Mr. Chairman, my time has expired and I yield back.
1727 Thank you very much.

1728 *Mr. Rush. The gentleman yields back. The chair now
1729 recognizes Mr. Doyle for 5 minutes.

1730 *Mr. Doyle. Well, thank you, Mr. Chairman. And I want
1731 to thank you and the acting ranking member for holding this
1732 hearing today. I want to thank all the witnesses for their
1733 testimony, and give a special shout out to Commissioner Camp,
1734 of fellow Western Pennsylvanian.

1735 It is good to have you here on the panel.

1736 The commissioner knows in Western Pennsylvania we are an
1737 all-of-the-above region. We do fossil fuels, we do nuclear,
1738 we do renewables. And the people that work in those
1739 industries don't love one better than the other. What they
1740 love is to feed their families. And that is what we are
1741 talking about.

1742 So we know that, over time, there is going to be a
1743 transition as we take renewables and put more on the grid,
1744 and deal with their intermittency by using things like

1745 advanced nuclear and storage so that we can lessen the need
1746 on fossil fuels. But when we make this transition over time,
1747 the key is to make sure that we don't leave people behind,
1748 that we don't leave families behind, that if we are going to
1749 create new manufacturing and a clean economy, that we build
1750 those plants in areas where people may be displaced because
1751 they are working in industries that we are going to be less
1752 reliant on. I think that is going to be the key to success.

1753 But we are glad to have all the panelists here.

1754 Mr. Gordon, we have all heard about the struggle of
1755 utilities getting past that 80 percent figure. Everyone I
1756 have talked to is saying, you know, we can reduce 80 percent,
1757 but it is that last 20 -- you know, to get us to net zero
1758 carbon by 2050 -- that is the tough part. How important will
1759 energy storage and reducing its costs be to expanding
1760 renewable energy?

1761 *Mr. Gordon. Thank you, Congressman Doyle, for your
1762 question. And as it happens, I was born in Indiana,
1763 Pennsylvania and lived there for 11 years, so I am also a
1764 Western Pennsylvania native.

1765 I think, to your question directly, you know, energy
1766 storage is going to be a critical component to the future of
1767 the generation stack, and reducing those costs will be
1768 imperative, of course. I think what we are largely looking
1769 forward to is, you know, additional cost reductions over

1770 time, different types of batteries being designed, and
1771 ultimately working with new technologies like hydrogen to see
1772 how hydrogen can play a role with battery storage, as well.
1773 So I think we are very optimistic.

1774 But you are right, the last 20 percent, that last mile,
1775 is going to be more expensive than the first 80. And we just
1776 need to put our heads together. And I think, as a country,
1777 we have got some pretty bright minds. And if we are
1778 committed to it, I think we can make it happen.

1779 *Mr. Doyle. Thanks.

1780 Mr. Powell, you mentioned how important driving down
1781 emissions in the industrial sector will be. Improvements at
1782 industrial facilities, they are big, capital-intensive
1783 projects. And outside of tax credits for carbon capture, how
1784 would you suggest we create a long-term structure for
1785 cofinancing big emission-reducing investments?

1786 *Mr. Powell. Thanks for the question, Congressman.
1787 Thanks as well for your leadership on so many of the
1788 innovation provisions that landed in the Energy Act of 2020,
1789 a very important sector, and your support for all of these
1790 different technologies.

1791 Carbon capture and incentives for carbon capture are
1792 actually -- are absolutely an excellent place to start for
1793 industrial emissions. So probably the fastest way we can
1794 bring those emissions down is simply capturing them before

1795 they leave the plant, and using the same underlying process.

1796 We can also do 2 other major things. One is to find
1797 alternative ways to supply some of the heat that go into
1798 industrial processes. That is the largest single source of
1799 those emissions. And so that would be providing clean heat
1800 in those facilities. So that would be with an advanced
1801 nuclear reactor that could provide a lot of that heat, with
1802 hydrogen or renewable fuels, those sorts of things, or the
1803 fuels themselves with carbon capture.

1804 The other thing we can do is provide different processes
1805 in the first place. So, for example, think about a steel
1806 plant that doesn't use coking coal to do that reduction of
1807 steel, but instead does electrochemical reduction. There is
1808 a company up in Boston called Boston Metals that is
1809 pioneering new technology around that, and would use direct
1810 electrical current to do that reduction of the iron ore.

1811 *Mr. Doyle. Thank you, Mr. Powell. I want to get this
1812 question to Dr. Pacala, too, because I think it is important.

1813 All of you have testified that ensuring we don't leave
1814 communities behind as we move to a cleaner economy is
1815 crucial. And I believe that fervently. What policies do you
1816 see as critical to ensuring that future energy development or
1817 the manufacturing of energy equipment is done in those areas
1818 who have historically been affected by pollution or losing
1819 their jobs, their fossil fuel jobs? What do you say to that,

1820 Dr. Pacala? What do we need to do to ensure that?

1821 *Dr. Pacala. Well, the package that we proposed is
1822 designed to do exactly that, right? So the idea is that --
1823 let's suppose that you are a town, and we are in middle
1824 America with a dominant employer that is going to be lost.
1825 And the wind and solar jobs are great, but they don't
1826 compensate for this highly-concentrated employment in your
1827 town. The -- it is worthwhile understanding that more towns
1828 gain resources than lose them. Where they lose them, they
1829 lose them in a way that would otherwise be catastrophic.

1830 And so what could be done? Well, the idea first is that
1831 you have to anticipate the loss, and plan for it in advance,
1832 because if it catches you by surprise that is it, right?

1833 And so the idea is to have a bunch of regional centers,
1834 together with state offices that work together, where
1835 Representatives of Congress, and mayors, and governors, and
1836 other officials can meet to understand what regionally is
1837 likely to happen, and to serve as a conduit for planning
1838 grants to towns and to counties. And there, the idea is to
1839 anticipate what is going to happen and when, with technical
1840 assistance that other programs would provide.

1841 Having discovered that something was going to happen --

1842 *Mr. Doyle. I see we are way over our time, and I want
1843 to be polite to my fellow colleagues, but we will talk more
1844 about this. Thank you so much.

1845 Mr. Chairman, I apologize and I yield back.

1846 *Mr. Rush. The chair now recognizes the gentleman from
1847 West Virginia, Mr. McKinley, for 5 minutes.

1848 *Mr. McKinley. Thank you, Chairman. And as a good
1849 friend, it is always good to see you.

1850 I thought the premise of this hearing was going to be
1851 about the decarbonization, accelerating the decarbonization
1852 in the United States. And I have been functioning for years
1853 now on the fact that climate change is a global issue, and
1854 requires a global solution.

1855 So we have heard from previous panels, including Gina
1856 McCarthy, when they said that, if America alone decarbonizes,
1857 the impact on the global environment would be virtually
1858 immeasurable. And then they went on to say that, as long as
1859 countries like China and India are expanding their dependence
1860 on fossil fuels, America will still experience wildfires on
1861 the West Coast, droughts and floods in the Midwest, and
1862 hurricanes in the East.

1863 So I guess the issue is can America decarbonize?
1864 Absolutely. I would agree, it can. But at -- what is the
1865 cost to families, communities, and businesses that are
1866 reliant on fossil fuels?

1867 This report that everyone is referring to was silent
1868 about Hazard, Kentucky; Gillette, Wyoming; Cadiz, Ohio.
1869 There are no transitional employment opportunities in those

1870 areas.

1871 So to Rich Powell, let me ask a couple of questions of
1872 you. First, I say, Rich, I agree with your testimony where
1873 you said serious federal policy proposals must also reflect
1874 the global nature of the challenge. Let me ask, Rich, have
1875 you read the National Academy report?

1876 *Mr. Powell. I have.

1877 *Mr. McKinley. Okay. Do you think that there were --
1878 maybe there was -- given that there were no representatives
1879 who were not academics among the authors, and based on their
1880 tweets and papers that they have published, do you believe
1881 that the authors may have had a bias against fossil fuels?

1882 *Mr. Powell. It certainly seemed like an objective was
1883 first to think first about decarbonization, and maybe
1884 secondarily about the transmission impacts.

1885 *Mr. McKinley. Okay. Do you agree that one of the
1886 authors who tweeted out that -- and his quote was in his
1887 tweet, showing -- these are the people that put this -- that
1888 "America can eradicate poverty by decarbonization.'" Do you
1889 agree with that?

1890 *Mr. Powell. I don't think it is the first way we would
1891 eradicate poverty.

1892 *Mr. McKinley. But that was the statement, that
1893 decarbonization is going to eradicate poverty.

1894 And then, also, part of the study was, quote, it was to

1895 "build an energy system without social injustices that
1896 permeate the current system.'" Do you think it does permeate
1897 the current system?

1898 *Mr. Powell. I don't. I believe that there can be --

1899 *Mr. McKinley. Okay, let me get back on point, through,
1900 Rich, because I have got some more questions I would like to
1901 get with you. So back on point, were the policies outlined
1902 in this study -- because it was very comprehensive, and very
1903 thoughtfully put together from white papers that they
1904 published. But will it encourage other nations like China
1905 and India to actually follow our lead and reduce their
1906 emissions?

1907 *Mr. Powell. It focuses on U.S. emissions reductions.

1908 *Mr. McKinley. Yes.

1909 *Mr. Powell. The one piece that might have a global
1910 impact is the R&D section, and that could reduce the cost of
1911 global emissions. But beyond that, it is largely silent on
1912 the global question.

1913 *Mr. McKinley. Now, since the anti-fossil fuel zealots
1914 that we deal with in Washington are agitating for America to
1915 choose this simplistic route, just -- in other words,
1916 discontinue fossil fuels. That is one way to do it. You
1917 can. That is a fork in the road, you can take that, and we
1918 can not use fossil fuels. But wouldn't America be better
1919 off, better advised if they adopted a more pragmatic approach

1920 to capturing carbon through advanced innovation and
1921 deployment?

1922 *Mr. Powell. We should. We should be focusing on
1923 reducing emissions, not eliminating fossil fuels.

1924 *Mr. McKinley. Thank you. So wouldn't that approach
1925 protect the economy, reduce carbon emissions, and develop a
1926 technology that we can export around the world for other
1927 nations that are offensive in their emissions? Wouldn't that
1928 be the better approach, rather than just doing away with
1929 fossil fuels?

1930 *Mr. Powell. Prioritizing carbon capture so that we can
1931 make the breakthroughs that the rest of the world can then
1932 use to decarbonize should really be at the top of the list of
1933 our energy innovation priorities.

1934 *Mr. McKinley. So, Rich, would you think that -- would
1935 you concur that the global environment will not improve
1936 measurably if America alone decarbonizes?

1937 *Mr. Powell. I would.

1938 *Mr. McKinley. Okay. Is there -- what policies -- in
1939 the remaining few seconds here, what else would you be saying
1940 for us that we should be adapting?

1941 *Mr. Powell. Well, I think, if you look back at the
1942 Energy Act of 2020, the technology that received the most
1943 bipartisan support in that very bipartisan bill was carbon
1944 capture. That bill now calls for a massive demonstration

1945 program for carbon capture technologies. But a lot of work
1946 remains to actually implement that. And so I would encourage
1947 this committee and all of Congress to focus now on
1948 implementation.

1949 *Mr. McKinley. Thank you very much, and I yield back
1950 the balance of my time.

1951 *Mr. Rush. My friend yields back. The chair now
1952 recognizes Mr. McNerney for 5 minutes.

1953 *Mr. McNerney. Well, I thank the chairman for the
1954 hearing, and the ranking members.

1955 Your witnesses -- your testimony has been very important
1956 and useful, so thank you for coming out, or appearing today.
1957 Like all of my colleagues, I am extremely concerned about
1958 what is taking place in Texas. Millions are suffering in the
1959 cold with no immediate end in sight.

1960 Dr. Pacala, we have heard from Mr. Gordon about what
1961 happened to cause the blackouts in Texas. Would you walk us
1962 through your understanding of what happened?

1963 *Dr. Pacala. Yes. I am not an expert, but I have
1964 consulted experts on it, and my understanding is just about
1965 what has been said, predominantly. There was, in fact, a
1966 failure of some of the generating capacity across the board,
1967 and it was across all types of generating capacity. So the
1968 thermal units -- that is, natural gas and coal plants and
1969 nuclear plants -- all had a failure rate. And the cause was

1970 primarily, you know, different routes in which the coal --
1971 the cold can prevent the plant from operating. So that, for
1972 example, if you have got a pipeline from a production field
1973 to a power plant, when the production field goes down because
1974 of cold, the fuel stops.

1975 There was also some loss of wind capacity. The wind
1976 capacity that went down was a little bit less in sort of
1977 percentage terms than the thermal capacity. But it is not
1978 really a meaningful difference, right? So -- and those were
1979 primarily due to pipes freezing.

1980 And beyond that, I think that what has been said about
1981 the interconnectivity of the Texas grid is right, right? If
1982 you had more interstate transmission, you had high voltage
1983 lines that could bring power in, they would have been better
1984 off.

1985 *Mr. McNerney. Well, thank you. At last week's markup
1986 in this committee we heard a lot from Republicans about
1987 California blackouts. And now we are seeing the same thing
1988 happen in Texas.

1989 Republicans again are blaming renewable energy this time
1990 for Texas problems. This is ludicrous. This is ludicrous
1991 because -- and both states are similar, extreme weather
1992 related to climate change, together with underinvestment in
1993 our electric utility and infrastructure and resilience --
1994 reducing renewables will just accelerate climate change and

1995 increase the suffering of our constituents.

1996 So moving on, as we continue to confront the severe
1997 impacts of climate change it is critical to prepare by
1998 hardening the grid. The issue is front and center to me,
1999 since California has its share of natural disasters and
2000 extreme weathers.

2001 Mr. Gordon, should the federal government have a role in
2002 grid hardening for extreme weather events?

2003 *Mr. Gordon. Thank you, Congressman. I do think that
2004 the government should have a role in hardening the grid for
2005 extreme weather events, yes.

2006 *Mr. McNerney. Well, do you have any recommendations
2007 for resilience improvements that are also clean?

2008 *Mr. Gordon. Well, I think, going back to the
2009 infrastructure question, getting more transmission built,
2010 connecting to renewable resources would be, by definition, a
2011 clean way of doing that, while hardening the grid for
2012 reliability and resiliency for when these events happen.

2013 *Mr. McNerney. Thank you.

2014 Dr. Pacala, same question. Is there a role for the
2015 federal government in grid hardening with respect to clean
2016 (sic) weather?

2017 And how do we make sure that that is done in a way that
2018 produces clean energy?

2019 *Dr. Pacala. So there is absolutely a role. And the

2020 report that we released has very specific recommendations for
2021 regulatory reforms that are critical to get the grid reforms
2022 in place, certainly in time to do a rapid decarbonization of
2023 the U.S. grid.

2024 And there are 2 difficult actions in Congress that we
2025 think are essential. One is a clarification of the Federal
2026 Power Act, so that it is understood that it does not limit
2027 the ability of states to use policies to support the entry of
2028 zero carbon resources into electric utility portfolios and
2029 wholesale power markets. And the second is an amendment of
2030 the Energy Policy Act to assign FERC the responsibility to
2031 design the national interest electricity corridors.

2032 And then there are a whole host of other recommendations
2033 that are very specific, and that you can find in the --
2034 mostly in the footnotes to that table I talked about.

2035 *Mr. McNerney. Well, I am going to ask, in my remaining
2036 time, Ms. Glover, do you think there is a role for
2037 electrification as a part of the effort to improve
2038 resilience?

2039 *Ms. Glover. I think there probably is a role for
2040 electrification, but I think there is also a much larger role
2041 for energy efficiency in improving resilience. Right? The
2042 less that we use opens up capacity, and it helps utility
2043 companies and others not to have to invest in some
2044 infrastructure if we do energy efficiency right and make

2045 those kinds of investments.

2046 *Mr. McNerney. Thank you. Let's get back to
2047 efficiency.

2048 All right, I yield back, Mr. Chairman. Thank you.

2049 *Mr. Rush. The gentleman yields back. The chair now
2050 recognizes Mr. Griffith for 5 minutes.

2051 *Mr. Griffith. Thank you very much, Mr. Chairman. Let
2052 me say first I look forward to seeing the science on what
2053 caused this cold snap in Texas. I know it is easy to go and
2054 say this is a part of climate change, and that may be a
2055 contributing factor. But apparently there was a similar
2056 weather pattern in Texas in 1928, which is why one of our
2057 earlier folks talked about this happening about once a
2058 century in Texas, because apparently it has happened before.
2059 So I don't know that we can put all of the cold weather in
2060 Texas at the feet of climate change or global warming.

2061 Ms. Glover, thank you so much for talking about energy
2062 efficiency. I do have some good-paying jobs in my district
2063 with that, in a coal district, but I do appreciate you
2064 highlighting that very much.

2065 And some have called for the complete elimination of
2066 using our fossil fuels, and I was pleased to hear Chairman
2067 Pallone say that, while we may shift, and transition, and
2068 lower that number, that he didn't see it being eliminated
2069 from part of our mix. And it is interesting, because one of

2070 my professors, a science researcher at Virginia Tech working
2071 on fossil fuels, has lamented in the past that never before
2072 have we eliminated or tried to eliminate a energy source,
2073 whether we started with wood, et cetera. With the exception
2074 of whale oil, we have never eliminated one. We have reduced
2075 it, depending on market conditions, and it improved
2076 efficiencies, but we have never eliminated one of our
2077 potential energy sources. And I think that is important to
2078 keep in mind.

2079 Mr. Powell, I appreciate you mentioning that we are
2080 trying to make false choices, that you have to choose one or
2081 the other. I am an all-of-the-above kind of guy. I like
2082 your concepts of using more innovation. You talked with my
2083 colleague, Mr. McKinley, about reducing emissions, and that
2084 that ought to be at the top of our list, and doing the
2085 research to reduce that.

2086 I would point out that in my district -- and they are
2087 all over the country, but one in my district, MOVA
2088 Technologies, has been working on panel bed filtration
2089 systems that not only eliminate CO2, but eliminates,
2090 depending on what panel you have and what industry you are
2091 dealing with, it eliminates all kinds of other pollutions.
2092 It is already out of the test phase and is now into the -- in
2093 the small test phase -- and it is now going to the next
2094 level. And these are the kinds of things that I think we

2095 need to be working on, as well.

2096 Now, we can invest all the money we want to in research
2097 and innovation, but if industry is disincentivized to install
2098 new technologies, it will be for naught. Last week I had a
2099 meeting with the pulp and paper workers -- challenges
2100 associated with the new source review permitting program.
2101 And we have learned that the NSR often discourages new
2102 investments at facilities like paper mills, a furniture
2103 factory in my district, other manufacturing plants and power
2104 plants. It discourages them from making small bites of the
2105 apple. They are told if you take a small bite, you have got
2106 to swallow the whole apple.

2107 I have reintroduced the New Source Review Permitting
2108 Improvement Act, H.R. 245, which would reform the program so
2109 that we can upgrade U.S. facilities with new pollution
2110 control technology. But not having --

2111 [Audio malfunction.]

2112 *Mr. Griffith. -- is new source review a barrier to
2113 reducing emissions, Mr. Powell?

2114 *Mr. Powell. Yes, sorry, you froze there for a second,
2115 but I think I heard the question. Thanks so much for the
2116 question. Thank you for your leadership on this vital issue
2117 for carbon capture technologies, really for all technologies
2118 which would help reduce the emissions from existing
2119 facilities.

2120 It absolutely is a barrier in its current form. I do
2121 not think that the original drafters of the Clean Air Act
2122 understood this kind of scenario. I think they would have
2123 probably framed new source review in a different way, had
2124 they been thinking about things like carbon dioxide emissions
2125 at the time. I think reforming that so that we don't have
2126 NSR as a barrier, and so that you don't enter an entirely
2127 different regulatory regime if you simply bolt one thing on
2128 to a facility which significantly helps reduce the emissions.
2129 That actually has the exact opposite effect of, I think, what
2130 folks would have been trying to accomplish with the original
2131 new source review revisions.

2132 And so I think reforms are urgently needed, and I think
2133 your proposal is an excellent step in that direction.

2134 *Mr. Griffith. Thank you very much. I mean, look, a
2135 lot of times people characterize it as just trying to get rid
2136 of the rules. No, what we are trying to do is make the rules
2137 so that they can be used effectively. And if you take one
2138 bite at the apple every 3 or 4 years, a factory can make its
2139 facility a whole lot better. If you have to do the whole
2140 thing at one time, they are never going to do it, and it
2141 slows down our ability to control emissions.

2142 I was pleased to hear, you know, discussion, and I know
2143 the intent is good about, you know, being prepared and
2144 planning -- and this would have been Mr. Pacala -- being

2145 prepared and planning. I come from an area where there is a
2146 lot of coal production and a lot of lost jobs already. But I
2147 will tell you that there is a December 6, 2019 New York Times
2148 article, which I forwarded to committee staff because I would
2149 like to have it introduced into the record.

2150 This article talks about a town -- 10 years has been
2151 spending money trying to reinvent their economy. They have
2152 created a law school with some of their money. They have
2153 created a pharmaceutical school, or a pharmacy school in
2154 their community. And they have spent -- according to that
2155 article, they have spent approximately \$170 million over this
2156 20-year period trying to, you know, reinvent themselves.

2157 Now, there is all kinds of other issues -- road access
2158 -- that we are working on. But I will tell you that --

2159 *Mr. Rush. Will the gentleman --

2160 *Mr. Griffith. Give me just one second, thank you. But
2161 I will tell you that 1 in 6 jobs is still coal-related, and
2162 the county is getting hit hard.

2163 *Mr. Rush. The gentleman --

2164 *Mr. Griffith. I yield back, I apologize. Thank you,
2165 Mr. Chairman. I apologize.

2166 *Mr. Rush. That is quite all right. The chair now
2167 recognizes Mr. Tonko for 5 minutes.

2168 *Mr. Tonko. Thank you, Mr. Chair, and this is a great
2169 hearing, and there is so much to cover. I will try to get

2170 through as much as I can.

2171 I don't think we should overlook the importance of
2172 energy efficiency and decarbonizing our energy system. There
2173 are many widely available, cost-effective measures that can
2174 be done to improve the energy efficiency, as well as the
2175 health and safety of homes. But we need to recognize that
2176 many low-income people aren't going to take advantage of a
2177 tax credit. And for this category of individuals, often they
2178 pay a much higher percentage of their incomes on energy
2179 bills.

2180 So, Ms. Glover, what is the role for a program like
2181 DoE's Weatherization Assistance Program to improve energy
2182 efficiency of low-income homes?

2183 *Ms. Glover. Thank you so much, Congressman, for that
2184 question. You know, WAP program, the weatherization program,
2185 is an important program for low-income consumers. And
2186 certainly, I would say even middle-income consumers would, if
2187 they could take advantage of it, would want to. It certainly
2188 needs to be funded more, and there have been some requests to
2189 add more funding to that program.

2190 But I would also say that, as you as you all in -- as
2191 Members of Congress have been thinking about how do we direct
2192 that funding to the right families. And so part of that
2193 thinking has to be what are the communities that we are going
2194 to start with first. Is weatherization, in and of itself,

2195 that program, going to be enough of an investment for some
2196 communities in rural and urban communities around this
2197 country? Their homes are not ready for even basic
2198 weatherization. And so we do have to think about what is the
2199 proper investment, and do we need to build on top of existing
2200 programs to make those communities more resilient, in terms
2201 of energy efficiency.

2202 *Mr. Tonko. Okay, thank you. And do you believe this
2203 program helps promote more equitable energy policy?

2204 *Ms. Glover. I do think that it does. I just -- I
2205 think that it is -- you know, look, we -- there are so many
2206 things we need to invest in. And I think that weatherization
2207 -- and that program is probably one of those programs that
2208 needs greater investment.

2209 *Mr. Tonko. Thank you. And last year Congress enacted
2210 reforms to strengthen the program, and President Biden has
2211 called for weatherizing 2 million homes. So I think that is
2212 a great shot in the arm.

2213 Ms. Glover do you believe funding for a program like the
2214 Weatherization Assistance Program should be considered for
2215 inclusion in a future infrastructure package?

2216 *Ms. Glover. I do. I do believe that funding for that
2217 could be included in a future infrastructure package.

2218 But I want to say that, you know, if we are trying to
2219 impact low and moderate-income families, it is not just the

2220 weatherization program that can do that. There are other
2221 programs, as well, and other proposals out there that also --
2222 our small business proposal, I think, is a good one. It
2223 talks about how you bring jobs to these communities and small
2224 business growth to those communities, as well as ensuring
2225 that the businesses in those communities are thriving.

2226 I think Congresswoman Blunt Rochester's bill on mission
2227 critical and building infrastructure is another important
2228 program that can help, not only those communities in terms of
2229 making them more resilient, but also in terms of jobs and
2230 small business opportunity, and addressing our equity needs.

2231 So there are lots of programs that I think have been
2232 proposed that will get us where we need to be, and at the
2233 same time address our issues around climate change,
2234 decarbonizing our energy grid, and providing economic
2235 opportunity to communities around the country, particularly
2236 those who are suffering the most.

2237 *Mr. Tonko. Thank you.

2238 And Dr. Pacala, could you give us a sense of why the NAS
2239 report recommended increasing funding for weatherization?

2240 *Dr. Pacala. Yes, the -- we recommended both an
2241 increase in funding in the low-income -- in LIHEAP and in the
2242 Weatherization Assistance Program because of the need to
2243 upgrade infrastructure, which has lagged behind, and which
2244 disproportionately impacts the incomes of low-income

2245 Americans already.

2246 And so there are -- we did discuss the inefficiencies
2247 built into some of those programs, but on balance thought
2248 that we ought to put more money into them. So there are
2249 specific numerical amounts in the recommendations, and it
2250 followed a review of the performance of both of those
2251 programs.

2252 *Mr. Tonko. Thank you. Thank you very much.

2253 Mr. Powell, I am excited to hear that ClearPath is
2254 getting involved in the industrial sector. Do you believe
2255 low emissions hydrogen could play a role in decarbonizing
2256 certain manufacturing processes?

2257 *Dr. Pacala. Thanks for the question, Ranking Member
2258 Tonko, thanks for your leadership on the Energy Act of 2020,
2259 as well.

2260 I absolutely believe that hydrogen could be a big part
2261 of that solution.

2262 As I mentioned earlier, low carbon heat is going to be a
2263 core component to decarbonizing the industrial sector, and
2264 low-emission hydrogen, whether that is produced from natural
2265 gas, but carbon capture from renewable electrolysis, from
2266 nuclear electrolysis, or maybe a whole lot of processes that
2267 we don't even understand or realize yet could be a really
2268 significant part of that transition.

2269 *Mr. Tonko. Thank you very much.

2270 Well, Mr. Chair, I think I have exhausted my time, so I
2271 will yield back.

2272 *Mr. Rush. The gentleman yields back. The chair now
2273 recognizes Mr. Johnson for 5 minutes.

2274 *Mr. Johnson. Thank you, Mr. Chairman. I will be
2275 really brief, so I can get to my questions. But as I listen
2276 to my colleagues and some of our witnesses today, we keep
2277 hearing proposals for, I quote, "deep decarbonization" that
2278 would serve, really, only to kill good-paying American jobs,
2279 while simultaneously increasing our supply chain dependency
2280 on China, embolden Russia, and, ironically, do very little to
2281 decrease total global carbon emissions.

2282 I keep thinking, why would we want to go down that road?
2283 Well, I think we might have found the answer. One of our
2284 witnesses today, in their prepared testimony, cited a desire
2285 to achieve a -- and I quote -- "fundamental economic and
2286 social transition."

2287 So, I am wondering, are decarbonization policies about
2288 climate or energy at all, or is it more about power and
2289 control?

2290 Outside of this Zoom hearing, in the real world,
2291 abundant American resources are being leveraged to create
2292 jobs, revitalize communities, and strengthen American
2293 manufacturing. So I have a question for Commissioner Camp.

2294 Thank you for joining us, Commissioner. My district is

2295 not far from Beaver County, just across the state line in
2296 eastern and southeastern Ohio. We have a site ready for a
2297 similar, I think, cracker facility. And just as in Beaver
2298 County, it is intended to take advantage of the vast natural
2299 gas resources right below our feet in Ohio and Pennsylvania.
2300 It is still awaiting a final investment decision but, God
2301 willing, if construction begins on this project, we will see
2302 our communities benefit immediately with thousands of workers
2303 coming to town. Is that your perspective, will we see those
2304 thousands of workers coming to town?

2305 And also, what does it mean for a community with a proud
2306 but distant industrial past to have heavy manufacturing like
2307 this return?

2308 *Mr. Camp. Congressman Johnson, thank you very much. I
2309 worked closely with the previous board in Belmont County,
2310 Ohio, where that proposed petrochemical plant is being set
2311 forth. Absolutely, we see right now -- in 2019, as I said
2312 before, when I testified in front of the Subcommittee on
2313 Environmental and Climate Change, we had roughly 3,500
2314 employees on site. Today we have 7,950 employees on site;
2315 7,000 are working there during the day, 950 in the night
2316 turn. We are seeing that.

2317 But not only are we seeing that at the plant itself, we
2318 are seeing the effects of them, even through this global
2319 pandemic, support our community. Our tax base has gone up

2320 due to this. There is a pilot program in place with Shell
2321 Petrochemicals for 20 years, 25 years. But we are going to
2322 see the downstream jobs. There are many, many, many options
2323 on property up and down Interstate 376, which is our
2324 headquarter here, where the train -- rail meets the river and
2325 Interstate 376. You can't purchase a piece of property in
2326 Beaver County right now that is an industrial site, because
2327 the options are exercised.

2328 *Mr. Johnson. So the bottom line is it is far from
2329 over.

2330 *Mr. Camp. It is far from over. We won't start seeing
2331 these downstream manufacturing jobs, the companies who
2332 utilize the rubber pellets that Shell Petrochemical will be
2333 making, for years. Once they start production, these
2334 companies will then start to look at building facilities in
2335 Beaver County, Western Pennsylvania, Allegheny County,
2336 Westmoreland, even into Ohio and West Virginia in
2337 Representative McKinley's district.

2338 *Mr. Johnson. Well, good. Well, good. Well, let me go
2339 to Mr. Powell now. Thank you, Commissioner.

2340 Mr. Powell, you made an important point earlier about
2341 how a molecule of carbon released in Shanghai has the same
2342 impact as if it was released in Chicago. Well, what I am
2343 hearing from my Democratic colleagues today is too much of a
2344 focus on reducing carbon emissions domestically, regardless

2345 of the cost to American jobs like those in Beaver County,
2346 without acknowledging that climate change isn't just
2347 America's problem to confront. In fact, even if America
2348 reduced its emissions to zero, there wouldn't be a measurable
2349 effect on the global climate.

2350 We need to take a step back here and put the American
2351 people first. Rather than trumpeting gimmicks like the Paris
2352 Accord, which gives a free pass to huge global emitters such
2353 as China and India, we have an opportunity to support
2354 pragmatic policies that can build new and carbon-free
2355 technologies like nuclear here in the U.S., and enable them
2356 to be built internationally.

2357 So, Mr. Powell, do you believe there is room for
2358 bipartisan consensus on improving advanced nuclear
2359 technology?

2360 And how best can we modernize our export process, which
2361 not only has clean energy benefits, but supports U.S.
2362 interests and national security?

2363 *Mr. Powell. Thanks for the question, Congressman.
2364 Thank you for your support for modernizing our nuclear
2365 exports infrastructure.

2366 I believe there is bipartisan consensus on advanced
2367 nuclear energy. It was one of the technologies highlighted
2368 in the Energy Act passed in December, demonstrating new
2369 pieces of that.

2370 I do think that the exports process, both the 810
2371 agreements and the 123 process do need to be modernized. We
2372 have to remember it is not a choice about whether a country
2373 is going to accept new nuclear technology. It is whether
2374 they are going to accept U.S. technology or Russian or
2375 Chinese technology. And our preference would be that it was
2376 American technology with American safeguards, and where
2377 America captures the economic opportunity and the benefits
2378 and the jobs of those exports.

2379 *Mr. Johnson. Well, thank you. Thank you, Mr. Powell.
2380 Mr. Chairman, I yield back.

2381 *Mr. Rush. The gentleman yields back. The chair now
2382 recognizes Mr. Veasey for 5 minutes.

2383 *Mr. Veasey. Mr. Chairman, thank you very much. And of
2384 course, as you know, Mr. Chairman, we are going through
2385 catastrophic weather events right now in Texas. And it is --
2386 you know, it is really bad. I am not going to mince words
2387 about it. It is as bad as it seems from afar. People don't
2388 have heat. People haven't had heat for days. We have had a
2389 record number of people going in to local hospitals because
2390 of carbon monoxide poisoning, trying to stay warm. It is
2391 bad. And I want to thank you for hosting this hearing today.
2392 And I wanted to ask some questions specifically related to
2393 this catastrophic energy failure that we are having in our
2394 state right now.

2395 The extreme weather events over the last few days have
2396 caused a massive failure to deliver electricity to those who
2397 desperately need it, as I just pointed out, and the inability
2398 of some of these power plants to produce electricity when our
2399 communities needed it the most meant that people in 254
2400 counties all across our state are going without power.

2401 And now we are at a point now, Mr. Chairman, to where
2402 there are people having to boil water. We have several
2403 places here in the Dallas-Fort Worth Metroplex where people
2404 are under boil alerts, because they don't have fresh water.
2405 I even -- I have heard of at least one hospital that doesn't
2406 have fresh -- that doesn't have adequate clean water.

2407 And in the days and weeks to come, we will be examining
2408 the questions of infrastructure-related causes, looking at
2409 what measures can be taken to properly weatherize and
2410 insulate our power plants of all fuel types.

2411 Another important issue for us to consider is how we can
2412 better connect Texas to the national grid to allow for inter-
2413 regional transmission to bring electricity from other areas
2414 of the country. And yesterday I sent a letter to FERC with a
2415 desire to start a conversation on this. There will be many
2416 benefits and challenges of allowing limited energy transfers
2417 into ERCOT territory in certain emergency situations. There
2418 are a number of legal and technical infrastructure hurdles
2419 that we will need to overcome for greater interconnection,

2420 and I believe that every option should be explored so we can
2421 avert any other potential disasters that we may have in the
2422 future.

2423 And as we continue to search for answers, I am glad that
2424 we have some experts on power generation with us here today.
2425 And Mr. Craig -- and I don't want to get into the silly
2426 season of comparing things that -- that has been too much of
2427 the conversation, that has been utterly ridiculous, that
2428 people are comparing these things. We obviously had failures
2429 with all of our platforms in ERCOT, and we need to figure out
2430 how we can weatherize these things. And I want to ask you,
2431 given that a large part of the blame for the Texas grid
2432 failure was due to some of our more traditional fuels around
2433 natural gas and coal and nuclear, and not having adequate
2434 weatherization and insulation, can you speak a little bit
2435 about a -- what -- about weatherizing a power plant for cold
2436 weather looks like?

2437 *Mr. Gordon. Thank you, Congressman. I am not sure I
2438 am the expert on how to weatherize a coal plant or a gas
2439 plant. I do think there are ways to do so. I think folks at
2440 ERCOT and the generation owners ought to, you know, consult
2441 with folks in the Dakotas, and Minnesota, and places like
2442 that, where they are dealing with these sort of things, you
2443 know, year in and year out.

2444 I will say, however, that the way the market is designed

2445 doesn't encourage additional investments in generation
2446 technology. For instance, we have peaking plants in Ector
2447 County. They do not have the capacity to burn fuel oil in a
2448 situation like this. If the ERCOT market was structured such
2449 that there was a way to compensate for that additional
2450 reliability, you would have plenty more generating owning
2451 companies invest in the dual fuel capabilities to ensure
2452 that, when a situation like this comes, that there will be,
2453 you know, backup fuel to keep the generation going.

2454 I would also say that additional investments in energy
2455 storage which don't require water would be a smart
2456 investment, as well. And again, you know, always going back
2457 to more transmission to connect different parts of the Texas
2458 grid, as well as to different parts of --

2459 *Mr. Veasey. Thank you very much.

2460 Mr. Chairman, I yield back.

2461 *Mr. Rush. The gentleman yields back. The chair now
2462 recognizes Mr. Bucshon for 5 minutes.

2463 *Mr. Bucshon. Well, thank you, Mr. Chairman. And this
2464 is a great hearing. It is timely.

2465 Look, I am an all-of-the-above energy believer. I think
2466 we should continue to pursue innovation and technology
2467 advances across the energy generating space. You know, my
2468 district is a coal district, however, and I just, you know,
2469 want to remind people that, actually, coal may be the most

2470 reliable source of energy in this situation, because you have
2471 a stockpile at your plant, you don't require a pipeline, and
2472 -- when the wind and solar panels don't get frozen up or
2473 covered in snow.

2474 That said, that is why I think we need to continue to
2475 innovate across the energy space, and not forget about fossil
2476 fuel.

2477 I also am very happy that part of this conversation has
2478 been about energy efficiency, because, you know, I grew up in
2479 a small town, 1,500 people. And I can tell you the homes are
2480 100 years old, and they are very energy inefficient. That is
2481 a very big piece of this.

2482 Mr. Gordon, how did Invenergy wind projects perform in
2483 Texas, and how many megawatts out of the total system had to
2484 be shut down due to cold weather and icy conditions?

2485 *Mr. Gordon. Thank you, Congressman, for the question.
2486 At various points of the last several days, many of our wind
2487 farms were not operational. However, at no point over this
2488 period did all of our wind projects fail to operate. So it
2489 was hit or miss. It was really dependent on the location of
2490 the facility. You know, some facilities were iced over more
2491 than others, and so some came through, you know, doing very
2492 well, better than expectations.

2493 *Mr. Bucshon. Okay, how did Invenergy's natural gas
2494 units perform during the same period?

2495 *Mr. Gordon. Yes, sir. So we were not able to procure
2496 natural gas. The transmission pipelines were not available.

2497 *Mr. Bucshon. Okay, so -- I mean, I am just going along
2498 the lines of innovation and technological advances that can
2499 help all aspects of our energy generating system, including
2500 natural gas, including wind. And, I guess in Texas, we saw a
2501 domino effect, where the wind started to fail early in the
2502 wintery conditions, which constrained the system. And then,
2503 as natural gas, coal, and nuclear facilities -- plants began
2504 to have operational problems and freeze off, the blackouts
2505 started.

2506 Mr. Powell, if Texas were 100 percent wind for power
2507 generation, what would have happened to the grid?

2508 *Mr. Powell. Well, I don't think Texas or any
2509 jurisdiction should be 100 percent any generation. You know,
2510 I think in any -- I just don't think it would be technically
2511 possible for Texas or any state to be 100 percent wind.

2512 *Mr. Bucshon. I think that --

2513 *Mr. Powell. If it was, this would have been a bad
2514 event, and I don't think --

2515 *Mr. Bucshon. I mean, it is a hypothetical question, I
2516 think proving my point again, that --

2517 *Mr. Powell. Sure.

2518 *Mr. Bucshon. -- we need to continue to pursue an all-
2519 of-the-above energy approach, which includes renewables and

2520 fossil fuels.

2521 In addition, I guess, homes having no heat, it was
2522 reported that electric vehicles saw a dramatic loss of
2523 charge, and many charging stations were unavailable. Mr.
2524 Powell, how do you -- how do we ensure that future -- the
2525 future of EVs and the reliability of the charging stations
2526 are not another way we could leave people without access to
2527 their vehicles?

2528 *Mr. Powell. It is a great question, Congressman. I
2529 think the unfortunate reality of this and many of the other
2530 extreme weather events we have seen, and will likely see more
2531 of, is that all parts of our energy system and our energy-
2532 dependent systems like transportation are going to have to be
2533 hardened for more extreme weather on both sides, for more
2534 extreme heat events and extreme cold events.

2535 Unfortunately, these extreme events are hard on all
2536 energy systems. They can be hard on batteries, and they can
2537 degrade the performance of these vehicles. So we are going
2538 to have to invest more in insulating these vehicles and
2539 improve technologies that can operate under a wider range of
2540 conditions if those are going to be a bigger part of the
2541 transportation system in the future.

2542 Unfortunately, it will --

2543 *Mr. Bucshon. I mean, you have probably seen -- I think
2544 everyone has -- major automobile companies announcing they

2545 are going to go completely electric in a short, fairly short
2546 period of time. And interestingly, you know, I think GM did
2547 a demonstration I posted on my social media, and they had an
2548 electric car plugged in, and they asked the GM executive
2549 where the electricity was coming from. And she replied,
2550 "Well, it is coming from the building.'" And then she said,
2551 "Well, it is the local power company providing power to the
2552 building.'" And that wasn't the question. The question was
2553 where does the electricity come from.

2554 And it turns out, in this area where they were
2555 demonstrating the electrical vehicle, 90 percent of the
2556 electrical power was generated from coal. So I just think we
2557 need to be open-eyed about this, and all of us, you know, try
2558 to be as least ideological and more practical as we can, and
2559 recognize that we need to continue to advance innovation and
2560 technology across the space. You know, wind turbines are
2561 going to learn from this. They are not going to freeze up
2562 any more, if we get some technological advances. The same
2563 thing is true with other forms of power.

2564 So I would encourage all of us to continue to support
2565 innovation and technology advances to decrease our carbon
2566 emissions, as we have more than any other country in the
2567 world, and work towards a lower carbon future.

2568 With that, Mr. Chairman, I yield back.

2569 *Mr. Rush. The gentleman yields back. The chair now

2570 recognizes Ms. Schrier.

2571 Ms. Schrier, you are recognized for 5 minutes.

2572 *Ms. Schrier. Thank you, Mr. Chairman, and thank you to
2573 our witnesses.

2574 Dr. Pacala, your report covers a wide range of
2575 technologies that need to all be deployed in rapid fashion in
2576 order to reach our goals and have diversity and avoid putting
2577 all of our eggs in one basket. And I want to ask
2578 specifically about hydrogen cells for energy and their
2579 potential applications.

2580 Washington State's energy portfolio is 80 percent clean,
2581 mostly because of two-thirds of our energy, our electricity,
2582 comes from hydropower. And hydropower provides a fantastic,
2583 reliable baseload. And sometimes there is oversupply,
2584 especially when you add wind and solar. And spilling more
2585 water, which, you know, you would like to do,
2586 environmentally, actually could further harm salmon
2587 populations. And so there is a lot of interest in capturing
2588 and storing that excess, including as hydrogen energy.

2589 And I recently had a really interesting meeting with the
2590 Douglas County PUD general manager, Gary Ivory, about the
2591 renewable hydrogen demonstration project happening in my
2592 district. And last September the Bonneville Environmental
2593 Foundation partnered with the county to develop the first
2594 hydrogen fueling station for fuel-cell electric vehicles in

2595 Washington State. Increasing development of these
2596 technologies and storing excess electricity in this way could
2597 go a long way toward building a clean energy economy.

2598 The White House has also pointed to green or renewable
2599 hydrogen as an area they are interested in. And I know the
2600 Department of Energy has been working on this innovation for
2601 years.

2602 Your report calls on a rapid scaling of hydrogen
2603 technology, stating that we need -- that this could create
2604 positive synergies. Now, in parts of my district I can't
2605 drive 2 minutes without seeing a Tesla, but I have yet to see
2606 a hydrogen-cell-powered vehicle. And so I just want to know,
2607 where are we with hydrogen innovation? Has it reached a
2608 point where it can play a serious role in helping the U.S.
2609 meet an interim goal of net zero by 2050? And can you talk
2610 about some of these positive synergies?

2611 *Dr. Pacala. So, like Rich Powell, I believe that
2612 hydrogen is a big piece of the long-term future. But the
2613 fact is that hydrogen, as an energy storage device, is still
2614 expensive. All right? And it is still expensive relative to
2615 other alternatives that we could deploy during the 2020s.

2616 So during the 2020s, if we expand our net zero power
2617 offerings primarily with wind and solar, while planning for
2618 other sources, right, while trying to reduce the very high
2619 cost now of nuclear, and while also preparing for CO2

2620 transport technology so that we continue to use decarbonized
2621 fossils -- if we, as a species, decide to do so, as a nation
2622 decide to do so -- then these are ways in which we can reach
2623 an 80 percent decarbonized power grid.

2624 And then hydrogen comes in probably later. And it
2625 depends on the combined ingenuity of people in the country.
2626 Now, I am a real believer in the combined ingenuity. It is
2627 one of many technologies that we need to double down, on R&D
2628 investments. Yes.

2629 *Ms. Schrier. Yes, I really appreciate that, because,
2630 first, it gives me a perspective on time. But second,
2631 starting these kind of pilot projects now is what will pave
2632 the way to the 2030s, and potentially having this.

2633 And we have heard a lot about resources, whether they
2634 are metals, solar panels that are cheaper now from China, and
2635 not wanting to be dependent, that this is just one of the --
2636 sort of the layers of redundancy that will help give us that
2637 kind of security.

2638 I wanted to ask, and I am not sure which of you is the
2639 best to ask, just about other ways of storing excess energy.
2640 Because we will get that from wind and solar, too. And I
2641 wonder if you could just comment -- I have got about 40
2642 seconds left -- about other ways of storing excess energy.

2643 *Dr. Pacala. So I can. Pumped hydro is the way we do
2644 it now, but we have exhausted a lot of their -- a lot of the

2645 sites for that.

2646 Long-term batteries that make fuels like hydrogen and
2647 store it is another way to do it. And there are a number of
2648 technologies that look for that. There are some exotic,
2649 long-term storage solutions.

2650 Right now, the center of the action on close to
2651 deployment or deployable is grid-scale storage in the -- sort
2652 of the 6-hour range, which is one of the sweet spots. And
2653 that is a real commercial opportunity for U.S. firms.

2654 *Ms. Schrier. Can you tell me more about that, the --
2655 oh, we are out of time.

2656 I yield back. Thank you very much.

2657 *Mr. Rush. The gentlelady yields back. The chair now
2658 recognizes Mr. Walberg for 5 minutes.

2659 *Mr. Walberg. Thank you, Mr. Chairman. We all agree on
2660 the need for a clean energy future. What we differ on, as
2661 this hearing title indicates, is the best path to get there.

2662 As many of my colleagues have already indicated, this
2663 Administration has dropped an economic bomb onto the nation's
2664 energy sector, threatening hundreds of thousands of jobs, and
2665 billions in state tax revenues that go toward supporting
2666 public schools, fire departments, police stations, and
2667 countless other community services.

2668 The Laborers International Union of North America said
2669 themselves that canceling the Keystone XL pipeline will

2670 result in the loss of 1,000 jobs immediately, and an
2671 additional 10,000 jobs over time.

2672 Mr. Powell, in your testimony you state that, according
2673 to the International Energy Agency, only 2 of 14 critical
2674 power-sector technologies are on track to reduce emissions in
2675 the timeframe laid out by President Biden's executive orders.
2676 Further, you state -- and I quote -- "Requiring further
2677 emissions reductions before those technologies are ready
2678 poses significant risks to the reliability and affordability
2679 of our energy system, and to the millions of workers whose
2680 jobs rely on that energy supply.''

2681 We have already heard demands that President Biden go
2682 further to ban all fossil fuels, shut down initial --
2683 additional pipelines, and enact policies inspired by the job-
2684 killing Green New Deal. And so, Mr. Camp, thank you for
2685 talking about the vital role natural gas plays in Western
2686 Pennsylvania. We know natural gas has already played a
2687 critical role in reducing emissions in the power sector.
2688 What about heavy industry?

2689 Can we continue to meet the demands of steel and cement
2690 facilities without natural gas?

2691 *Mr. Camp. Natural gas plays an important role in the
2692 heavy industries. You know, I don't specialize in can we
2693 meet the demands, but personally, what I see whenever I talk
2694 to the individuals who are running these facilities, that

2695 they need the natural gas to meet these demands. You know,
2696 that is based off their opinion.

2697 You know, I don't think we can cut the fossil fuels
2698 completely out. I think we can't abandon them. I think we
2699 have to clean them up. But I think this committee alone will
2700 work together to do that. It is important that we continue
2701 to use those fossil fuels to have that feedstock into these
2702 facilities.

2703 You know, as we talk in great lengths about nuclear, you
2704 know, Beaver County is home to First Energy -- is now Energy
2705 Harbor. We do have a nuclear power plant in Beaver County.
2706 We had a coal-fired power plant in Beaver County that closed
2707 down in 2019. So, you know, not -- as I speak, not just on
2708 the natural gas industry, when I say "all energy sectors,"
2709 that is what I am talking about here, in Beaver County, in
2710 Southwestern Pennsylvania.

2711 *Mr. Walberg. All-of-the-above plan. Thank you.

2712 Mr. Powell, according to the U.S. Energy Information
2713 Administration, no power sector technology has been
2714 responsible for more emission reductions than natural gas
2715 over the past decade. We have also moved to become a top
2716 exporter of liquid -- liquefied natural gas, allowing more
2717 counties and countries to utilize cleaner fuels. In your
2718 testimony you highlight the opportunity of exporting clean
2719 U.S. technologies and commodities. How does restricting

2720 fossil fuel development align with that line of thinking?

2721 *Mr. Powell. Well, thanks for the question,
2722 Congressman, thanks for your leadership on cleaner fossil
2723 technologies and innovation in this space.

2724 I do think there is a real tension there. Exporting
2725 liquefied natural gas, for example, is one of the top ways
2726 that we can help other economies around the world decarbonize
2727 their sectors. Often that liquefied natural gas is going in
2728 and it is displacing, often times, critical coal plants, some
2729 of the highest emitting plants in the world, or coal for
2730 district heating. So liquefied natural gas exports can play
2731 a huge role in that global decarbonizing picture. And I
2732 don't think that is necessarily being taken into account when
2733 folks are talking about restricting particular pieces of U.S.
2734 fossil extraction.

2735 *Mr. Walberg. And in my home state -- in fact, my own
2736 district -- America's largest electric utilities, like DTE in
2737 my district, have committed to reaching net zero emissions by
2738 2050.

2739 You also mentioned that zero-emission fuels like
2740 hydrogen should play a role in response to climate change.
2741 Has your organization looked at how existing infrastructure,
2742 such as our natural gas pipeline network, can be utilized to
2743 deliver alternative fuels?

2744 *Mr. Powell. Absolutely. I think we should all

2745 remember that we have this asset. We have, literally,
2746 trillions of dollars of natural gas infrastructure in the
2747 ground around this country. We should be trying to find ways
2748 to work with that as part of a low-carbon future. And there
2749 are so many ways.

2750 We could use that natural gas. We could create hydrogen
2751 with it, and capture the carbon emissions, and put them
2752 underground. We could partially run hydrogen alongside
2753 natural gas and other low-carbon fuels through the pipelines
2754 along the way. We could do a lot with that existing
2755 infrastructure. Again, we ought to be focusing on reducing
2756 the emissions, not on eliminating the use of the fossil
2757 fuels, and certainly not on eliminating the use of the fossil
2758 fuel infrastructure, which we have invested so dearly in, and
2759 which could be a real asset in decarbonizing.

2760 *Mr. Walberg. Thank you, Mr. Chairman. I yield back.

2761 *Mr. Rush. The gentleman yields back. The chair now
2762 recognizes Ms. DeGette for 5 minutes.

2763 *Ms. DeGette. Thank you so much, Mr. Chairman. I am so
2764 delighted to join your subcommittee in this Congress. I
2765 think that energy policy and, in particular, climate issues
2766 are going to be the preeminent issue in this Congress.

2767 And I also -- I want to share your concern, the concern
2768 of so many on this committee, about what has happened in
2769 Texas, which is really a national strategy (sic). And I will

2770 volunteer to put the resources of the Oversight Subcommittee
2771 to work in helping us make sure that we get to the bottom of
2772 what happened in Texas, and working with you to make sure we
2773 can have policies that address this.

2774 I just want to ask some questions of the panel about
2775 greenhouse gas emissions. And the first thing I want to say
2776 -- my staff actually wrote a question on this, but I don't
2777 think we need a question on it. I think everybody on this
2778 panel would agree Americans deserve affordable, reliable
2779 electricity. And that is becoming more and more of a
2780 challenge, something we need to deal with.

2781 I want to ask the panel this question: Does climate
2782 science tell us we need to reduce our greenhouse gas
2783 emissions to net zero by no later than 2050, and sooner, if
2784 possible, to minimize the risk of catastrophic climate events
2785 like we are seeing right now?

2786 Let's just go down the panel, if we can.

2787 Ms. Glover?

2788 [Pause.]

2789 *Ms. DeGette. You have gone on mute. There you go.

2790 *Ms. Glover. I said, "Congressman, I really don't know
2791 if scientists are telling you that it has to be net zero by
2792 2050. I'" --

2793 *Ms. DeGette. Okay, you don't know.

2794 *Ms. Glover. I don't have that knowledge.

2795 *Ms. DeGette. Okay. Dr. Pacala?

2796 *Dr. Pacala. Yes. So the science is extremely clear
2797 that, if you want to limit global climate change to
2798 substantially less than 2 degrees, the globe has to get to
2799 net zero by 2050.

2800 *Ms. DeGette. Okay, all right.

2801 *Dr. Pacala. There is no doubt about that.

2802 *Ms. DeGette. Thank you.

2803 Mr. Gordon?

2804 *Mr. Gordon. Yes, Congresswoman. Again, I am not
2805 qualified to answer that question.

2806 *Ms. DeGette. So you don't know, either.

2807 Mr. Powell?

2808 *Mr. Powell. So I echo Dr. Pacala's point that,
2809 globally, we need to make an extremely deep reduction in CO2
2810 emissions if we are to have that impact on the climate.

2811 *Ms. DeGette. Great. And Mr. Camp?

2812 *Mr. Camp. As Mr. Gordon said, I am not qualified to
2813 make that --

2814 *Ms. DeGette. Okay.

2815 *Mr. Camp. But with the -- with Dr. Pacala, this
2816 hearing we mentioned many times, this is a global issue.

2817 *Ms. DeGette. Absolutely.

2818 *Mr. Camp. And if we continue to take our fossil
2819 fuels --

2820 *Ms. DeGette. I appreciate that, sir. You are right.
2821 The 2018 report of the Intergovernmental Panel on Climate
2822 Change says that we need to reduce our global greenhouse gas
2823 emissions to zero no later than 2050, and sooner if possible.

2824 Dr. Pacala, I want to ask you if we have the technology
2825 today to achieve an ambitious reduction in carbon emissions
2826 by 2030, while still providing affordable, reliable
2827 electricity for every American?

2828 *Dr. Pacala. Yes, we absolutely have the technology to
2829 do that.

2830 *Ms. DeGette. Okay. And that is interesting, because
2831 what I heard, like, from my utilities is that we have most of
2832 the technology. It is that last 10 to 20 percent we just
2833 need to incentivize. Is -- would that be accurate, or do you
2834 think we could just get there today?

2835 *Dr. Pacala. Yes, it is absolutely accurate. So the --
2836 most net zero plans by 2050 call for a 75 percent or 80
2837 percent decarbonized -- de-emissioned grid, electricity grid,
2838 by 2030. Okay?

2839 *Ms. DeGette. Right.

2840 *Dr. Pacala. And so --

2841 *Ms. DeGette. Right.

2842 *Dr. Pacala. -- it is true that the last 20 percent is
2843 way harder.

2844 *Ms. DeGette. Right. But that is why we need to

2845 incentivize research and development, from --

2846 *Dr. Pacala. Right.

2847 *Ms. DeGette. -- what I have heard, to get there,
2848 because we can't get there without new technology, is that
2849 right?

2850 *Dr. Pacala. That is right. And also, right now, we
2851 get to use, for instance, our abundant natural gas capacity
2852 as backup generators to provide the firm source of
2853 electricity for when the wind doesn't blow, when the sun
2854 doesn't shine. And that gets you down to about 80 percent
2855 decarbonized. But then you have got to do something with
2856 those sources as well, either decarbonize them, carbon
2857 capture and storage, or build more nukes, or build some other
2858 -- you know, build long-term storage or something, some other
2859 form source.

2860 *Ms. DeGette. Right. So, just for my colleagues, I
2861 have got a bill, the Clean Energy Innovation and Deployment
2862 Act, which is designed to address this issue by setting up a
2863 3-speed mechanism where the speed to which we try to get to
2864 zero is impacted on how fast we can break through with new
2865 technology. So I will be talking more about that.

2866 Thanks to our whole panel. I appreciate it.

2867 Thanks again, Mr. Chairman. I yield back.

2868 *Mr. Rush. The gentlelady yields back. Let me just say
2869 to the gentlelady that I want to personally welcome you to

2870 the subcommittee, and I look forward to working with you over
2871 this next -- so again, my personal welcome to you to this
2872 subcommittee.

2873 *Ms. DeGette. Thank you.

2874 *Mr. Rush. The chair now recognizes Mr. Duncan for 5
2875 minutes.

2876 *Mr. Duncan. Thank you, Mr. Chairman. Thanks for this
2877 hearing. I want to enter into the record an editorial from
2878 The Wall Street Journal today. It has a lot of facts in it.
2879 It is entitled, "Texas Spins into the Wind," and I would
2880 like to enter that into the record.

2881 *Mr. Rush. Hearing no objections, so ordered.

2882 [The information follows:]

2883

2884 *****COMMITTEE INSERT*****

2885

2886 *Mr. Duncan. Thank you. I also want to point out --
2887 and Ms. DeGette may want to look at this article -- but there
2888 is a great graphic on there, very difficult to see on there.
2889 But let me just tell you that change in power output in the
2890 State of Texas from January the 18th until February the 17th,
2891 when generation reduced by almost 20,000 megawatts, that was
2892 a 93 percent reduction in wind power output.

2893 At the same time you saw coal increase by 47 percent,
2894 and natural gas increase. This is power generation output
2895 increased by 450 percent. I don't know that it was
2896 necessarily the transmission to the power plants, other than
2897 a diversion of some of the natural gas in Texas to meet the
2898 needs of powering and heating homes and hospitals and other
2899 communities.

2900 You know, Mr. Chairman, in my district we get a lot of
2901 our power from nuclear power. Nuclear energy produces a lot
2902 of the electricity in the Carolinas. In fact, Duke Energy in
2903 the Carolinas has a fleet of 11 nuclear power plants that
2904 make up more than 50 percent of the power utility in North
2905 Carolina and South Carolina. That fleet of nuclear power
2906 plants are responsible for cleaner air where I live. In 2019
2907 alone, this same nuclear fleet generated almost 74 billion
2908 kilowatt hours of electricity, and avoided the release of
2909 more than 52 million tons of carbon dioxide.

2910 I point that out because nuclear energy is the future if

2911 we want to lower our carbon emissions in this country. And I
2912 am all about next-gen nuclear power, I am all about SMRs and
2913 thorium reactors, and anything that we can do, Mr. Chairman.

2914 But I wanted to ask Mr. Powell, as you stated in
2915 testimony, in order to reduce CO2 emissions as fast as
2916 possible we need to modernize the permitting process. Last
2917 Congress I introduced a bill to modernize the review of our
2918 nuclear power reactor projects, and I plan to reintroduce
2919 this bill again in this Congress. I hope some of my
2920 colleagues on the other side of the aisle will join me on
2921 that. But could you -- what do you see as the biggest
2922 barrier to rapidly deploying new, clean-energy projects and
2923 -- whether it is nuclear and other clean technologies, Mr.
2924 Powell?

2925 *Mr. Powell. Well, first, thank you, Congressman, for
2926 your leadership on nuclear innovation and supporting the
2927 existing nuclear fleet, both extremely important. ClearPath
2928 was founded in the Carolinas, and we greatly appreciate the
2929 remarkable clean energy abundance that that nuclear fleet
2930 that Duke maintains provides, along with the clean air, and
2931 the tax base, and all the other great benefits of nuclear.

2932 You know, going forward with nuclear and continuing
2933 that, there is a couple of big challenges ahead. The first
2934 is modernizing the existing nuclear fleet so that those
2935 plants could all go through the second life extensions, and

2936 could go from being 60-year plants to 80-year plants.

2937 In the wholesale power markets, the ones that aren't
2938 regulated, a lot of those nuclear plants are facing extreme
2939 economic stress due to subsidized renewables and extremely
2940 low-cost natural gas. There is a number of pieces of
2941 legislation that have been introduced in the past Congress
2942 that I think could be looked at again this year that would
2943 take a stab at preserving those existing nuclear units, using
2944 EPA and other authorities to keep those generating, keep
2945 those online. I think that is a really important priority.

2946 Then, as we think about the future, and the next
2947 generation of reactors, obviously there is a big piece about
2948 regulatory reform. You have really taken this on at the
2949 Nuclear Regulatory Commission. Finding ways to streamline
2950 and shorten the timelining to permit new nuclear design is
2951 absolutely vital right now. The fastest the NRC could do is
2952 about 40 months. And with a lot of licensing activity in
2953 front of that to get a new nuclear design license, you can't
2954 even start building or financing it before you get that
2955 design license. That is a long time --

2956 *Mr. Duncan. Right.

2957 *Mr. Powell. -- kind of innovator, right, so finding
2958 ways to shorten that down.

2959 And then, once we get the plants actually -- the designs
2960 licensed, finding ways to then get the siting and the

2961 permitting of the specific sites done in a more expeditious
2962 manner, while not sacrificing in any way safety in that
2963 siting, I think is the next big challenge.

2964 *Mr. Duncan. Absolutely. And I just want to point this
2965 out, that in my district alone, replacing the Oconee Nuclear
2966 Station, which is a land use of about 2 square miles with
2967 solar, would require 107 square miles of land. That is
2968 nearly 4 times the size of the City of Greenville, South
2969 Carolina. To replace a nuclear power with wind would require
2970 over 854 square miles of land. That is more land than the
2971 entirety of Anderson County, which is in my congressional
2972 district. So we have got to address all these, I believe, in
2973 nuclear.

2974 Mr. Chairman, it is a great hearing, I have enjoyed it.
2975 And I look forward to continue to listen on the way out.
2976 Thanks.

2977 *Mr. Rush. The gentleman yields back. The chair now
2978 recognizes the gentleman from North Carolina, Mr.
2979 Butterfield.

2980 *Mr. Butterfield. Thank you very much, Mr. Chairman,
2981 for convening this very important hearing today. And
2982 certainly thank you to the witnesses for your testimony. Let
2983 me start with Mr. Gordon.

2984 Mr. Gordon, you referenced, I believe, a solar project
2985 in my district, a 75 megawatt solar project called Edgecombe

2986 Solar. It is in Edgecombe County, North Carolina, which is
2987 just a few miles from where I am right now. Let me just
2988 commend your company's decision to base this project in my
2989 district. This project, along with others across the state,
2990 will ensure that North Carolina remains a leader in solar
2991 energy deployment. So thank you so very much.

2992 Now, my question is, how can we continue to support the
2993 development of the solar industry? And perhaps you could
2994 provide some insights into your company's decision to build a
2995 solar farm in a rural community so we can learn more about
2996 what constitutes an attractive environment for solar and for
2997 renewables.

2998 *Mr. Gordon. Thank you, Congressman, for the
2999 opportunity to answer your question.

3000 I think, first and foremost, you have got to have the
3001 right conditions for a solar plant. So, you know, ample sun.
3002 But you also need interconnection capacity. You need to be
3003 able to connect to the grid at a cost that is affordable,
3004 because, you know, high cost to connect can kill a project
3005 quickly. And I think, you know, undermining -- or
3006 underpinning those 2 things, you need the customers who are
3007 willing to buy it. And what we are seeing right now is a --
3008 just a huge interest from Fortune 100 companies to invest in
3009 renewable energy.

3010 And so what we are doing is we are trying to work with

3011 some of these companies to find locations where they have
3012 interest in -- you know, in having renewables nearby to act
3013 as an energy hedge for them, or to provide renewable
3014 attributes to them.

3015 So I think the answer to your question, you know,
3016 complex. There is a lot of things going on. And ultimately,
3017 we are also looking for landowners who want a project. You
3018 know, we provide significant financial benefits to the
3019 landowners who participate. And so it -- the whole community
3020 is raised.

3021 *Mr. Butterfield. I am glad you are mentioning the land
3022 ownership aspect of it, because that is so critically
3023 important. I know it is here in my district.

3024 The construction of high voltage, low -- long-distance
3025 transmission facilities is highly necessary to meet the needs
3026 of the clean-energy transition. Existing utilities, such as
3027 electric co-ops and municipally-owned utilities, will rely on
3028 these transmission facilities for distribution of renewable
3029 energy. Mr. Gordon, as high-voltage transmission
3030 infrastructure is constructed to integrate growing renewable
3031 energy production, how can we make sure the services of
3032 existing electric utilities can continue to serve their
3033 customers uninterrupted?

3034 *Mr. Gordon. So the type of projects that we are
3035 proposing basically interconnect with the high-voltage grid

3036 at the various locations. They do not disrupt the local
3037 service whatsoever. And what they do is, ultimately, provide
3038 new resources, new low-cost, renewable resources to be
3039 shipped and delivered to areas of the country that may not
3040 have an abundance of geography to site new wind or new solar
3041 such as South Carolina.

3042 *Mr. Butterfield. Yes. Let me take my last minute with
3043 Ms. Glover, if I may.

3044 Ms. Glover, while climate change affects everyone, our
3045 most vulnerable communities disproportionately bear the brunt
3046 of impacts of climate change. This is why environmental
3047 justice is a critical part of the Clean Future Act. Low-
3048 income communities like my community and communities of color
3049 are more likely to lack resiliency against the risk of
3050 climate change, and less likely to have access to sustainable
3051 and affordable energy. We have got to fix this thing.

3052 Ms. Glover, from your perspective, what can we do to
3053 make sure that low-income communities, communities of color
3054 are better prepared for climate change?

3055 *Ms. Glover. Thank you so much for the question, Mr. --
3056 Congressman Butterfield, and for your leadership. You know,
3057 I am going to keep repeating my song, which is that I believe
3058 energy efficiency is really one of the starting points for
3059 this. And it should be the center point of these
3060 conversations.

3061 At the end of the day, we want to be able to get to
3062 customers, particularly those in low-income, disadvantaged
3063 communities, front-line communities, and help them to use
3064 less now, and invest in those communities so that they are
3065 using less, so that there is more money for them, but also to
3066 be able to develop their infrastructure so that it is more
3067 resilient. Those 2 things combined, I think, need to happen
3068 in those -- the worst of our communities, the communities
3069 that are suffering the most.

3070 And I believe that energy efficiency really is an
3071 opportunity that is sitting right there, and something that
3072 we can pull the trigger on fairly quickly, and can have some
3073 significant impact very quickly, as well.

3074 *Mr. Butterfield. Thank you, Mr. Chairman. I am right
3075 on the mark. I yield back.

3076 *Mr. Rush. The gentleman yields back. The chair now
3077 recognizes Mrs. Lesko for 5 minutes.

3078 *Mrs. Lesko. Thank you, Mr. Chairman, and good
3079 afternoon to the witnesses and all of the members.

3080 I agree with Mr. Pallone, that we need to try to work
3081 together to come up with an energy plan for the future of
3082 America. I think it needs to be a common-sense, affordable,
3083 reliable, high-quality energy plan.

3084 I have to tell you that I don't think it should copy the
3085 California policies, because my utility companies here in

3086 Arizona say that at certain times of the year California
3087 actually pays Arizona utilities to take their energy off of
3088 their hands. And I don't think that is probably a very good
3089 plan for the Californians.

3090 I do, Mr. Chairman, want to ask unanimous consent that
3091 an article mentioned by Morgan Griffith earlier be entered
3092 into the record. It is a New York Times December 6, 2019
3093 article entitled, "Can a Coal Town Reinvest Itself?"

3094 *Mr. Rush. I thought I had, by unanimous consent,
3095 already entered that into the record.

3096 *Mrs. Lesko. Oh, fantastic. Mr. Griffith had texted me
3097 and didn't know if it was done or not. So thank you.

3098 *Mr. Rush. Will the gentlelady -- for a moment? Let me
3099 just take another stab at it.

3100 Hearing no objections, so ordered. The lady's request
3101 for the -- entering into the record of the New York Times
3102 article.

3103 [The information follows:]

3104

3105 *****COMMITTEE INSERT*****

3106

3107 *Mrs. Lesko. Thank you, Mr. Chair. I have a question
3108 for Mr. Powell.

3109 Mr. Powell, the Center for Negative Carbon Emissions at
3110 Arizona State University is currently working on carbon
3111 removal technologies, particularly direct air capture under
3112 the direction of Klaus Kackner. Do you know if -- what we
3113 can do to increase the efforts and research on that
3114 technology and use of that technology?

3115 Do you think it is being financed enough?

3116 *Mr. Powell. Thank you so much for that question,
3117 Congresswoman, and thank you for your attention to this
3118 really important, relatively new technology.

3119 Everyone should remember that, when we say net zero,
3120 that means that folks might still be emitting as long as they
3121 have a corresponding offset, or something netting out those
3122 emissions, and pulling it back out of the atmosphere. And
3123 that is what these technologies like direct air capture, or
3124 broader carbon dioxide removal technologies could do. They
3125 could give us a lot of flexibility, and they could also, in
3126 the far future, if we decide there is just too much CO2 in
3127 the atmosphere, maybe we might decide to pull more out, just
3128 as a public service kind of a thing.

3129 And so it is very, very important. A lot of university-
3130 scale research is done at this stage. I was very excited to
3131 see in the Energy Act of 2020 a major new program to

3132 demonstrate these technologies at scale was authorized in
3133 that bill. This would be the real start of a big federal
3134 program to actually demonstrate it. There is a prize concept
3135 which would be conducted at the Environmental Protection
3136 Agency for breakthrough technologies in this space. And then
3137 there would be a more traditional demonstration program at
3138 the Department of Energy.

3139 Of course, the authorizing legislation is only the first
3140 step. And now your colleagues on the Appropriations
3141 Committee actually have to fund that research at DoE, and
3142 that prize at EPA. And I think significantly more can be
3143 done in this space.

3144 A number of utilities who have made net zero commitments
3145 seem to be relying on the existence of a serious amount of
3146 this technology 30 or 40 years from now. I know Duke Energy,
3147 for example, in some of their modeling has indicated they
3148 might like to buy as much as 8 million tons a year. That is
3149 a really significant market signal to innovators in this
3150 space. But that is a market signal far in the future. So we
3151 need to invest in the R&D along the way to make sure that
3152 that is actually going to be available when they want to
3153 start buying that in the future.

3154 *Mrs. Lesko. Well, thank you, Mr. Powell. That sounds
3155 like something maybe the Democrats and Republicans can agree
3156 upon as part of the energy mix. And so I hope we can.

3157 Mr. Powell, I have another question for you. My
3158 understanding is that the federal government is required to
3159 purchase 7.5 percent of its energy from renewable sources.
3160 But right now hydroelectric power isn't included as a
3161 renewable energy source. And I know Representative Schrier
3162 talked about all the hydroelectric power in her state. Why
3163 shouldn't hydroelectric power be included as a renewable
3164 energy source? It seems counterintuitive to me. And do you
3165 think it should be?

3166 *Mr. Powell. That is a great question. It absolutely
3167 should be. And to take a bigger step back, it is unclear to
3168 me why that requirement is only renewable resources. If what
3169 we care about is low-carbon energy, I don't see why that
3170 wouldn't be a low-carbon requirement for federal purchasing,
3171 not a renewable requirement.

3172 I was actually heartened to see, I believe, one of the
3173 executive orders from the Biden Administration actually
3174 proposed making that change, that it is going to be a carbon-
3175 free procurement, as opposed to a renewable procurement. A
3176 long way to go, I don't think that has been implemented yet,
3177 but I think that is a step in the right direction.

3178 And absolutely large and existing hydropower should be
3179 part of that mix. It is -- right now it is the second-
3180 largest renewable resource in this country, and it is by far
3181 the most flexible renewable resource in this country. So it

3182 certainly should be included in procurements like that.

3183 *Mrs. Lesko. Thank you, Mr. Powell.

3184 And Mr. Chairman, I yield back.

3185 *Mr. Rush. The gentlelady yields back. The chair now
3186 recognizes the gentlelady from California, Ms. Matsui, for 5
3187 minutes.

3188 *Ms. Matsui. Thank you, Mr. Chairman. And I am really
3189 looking forward to being on this subcommittee. And I also
3190 want to thank the witnesses for being here today. This is
3191 such an important subject area, and I think we can devote a
3192 lot of time to it, but I am trying to be as quick as
3193 possible.

3194 A clean energy development fueled by California's
3195 renewable portfolio standard or, as we call it, RPS, has
3196 attracted more than \$2 billion in clean energy investments.
3197 And the clean energy sector now employs over a half a million
3198 workers in the state. Now, federal tax credits for solar and
3199 wind energy have also made these developments possible. And
3200 the recent extension of these programs really will continue
3201 to fuel investments into clean energy and decarbonization.

3202 Given California's success with RPS, a national clean
3203 energy standard, or CES, should be a crucial solution for
3204 decarbonization. Dr. Pacala, I would like to ask you about
3205 the role a CES can play in driving decarbonization during
3206 this decade, the 2020s, and what is a realistic, ambitious

3207 clean-energy target for 2030?

3208 [No response.]

3209 *Ms. Matsui. Dr. Pacala?

3210 *Dr. Pacala. So I should start by representing what is
3211 in the report that we just released, and that is that we
3212 recommend a clean energy standard that -- particularly for
3213 electric power -- that gets us to 75 percent zero carbon
3214 electricity by 2030, and also a standard for zero emissions
3215 vehicles that gets us to 50 percent of sales for light-duty
3216 vehicles by 2030, and also a zero emissions standard,
3217 manufacturing standard, for home appliances, particularly
3218 home heating, but also home cooling.

3219 I want to also just double down on the point that you
3220 made, that the position that we are in, where we can do a
3221 transition at about the same cost as the energy system that
3222 we have had over the last 30 years -- actually, a little less
3223 than the energy system we have had for the last 30 years --
3224 the reason we are in that position is a triumph of human
3225 ingenuity, backed by public policy.

3226 So it is precisely the creation, for instance, of
3227 markets in wind and solar before they were ready, and also,
3228 to some extent, the unconventional natural gas by using
3229 public policy instruments that created these markets before
3230 they were ready, that allowed free-market competition to
3231 drive their costs down, and made them available as

3232 alternatives today.

3233 And the clean -- the fuel standard in California has
3234 been used in exactly that same way. I will note that one of
3235 the big companies doing direct air capture is making use of
3236 that subsidy to bring that technology into the marketplace,
3237 even though it is still pretty commercial, otherwise.

3238 *Ms. Matsui. Okay. Now I want to get into
3239 transportation. The Diesel Emissions Reductions Act bill
3240 that I have championed for many years was enacted last
3241 Congress. This legislation focused on providing millions of
3242 dollars in funding to retrofit polluting diesel engines in
3243 medium and high-duty -- heavy-duty vehicles with cleaner
3244 technologies.

3245 Similarly, my home state adopted the Advanced Clean
3246 Trucks bill, which requires truck makers to sell cleaner zero
3247 emission trucks in the state. Both initiatives will have
3248 significant consequences on reducing greenhouse gas emissions
3249 and air pollution for frontline communities.

3250 Dr. Pacala, once again, what are your recommendations
3251 for actions to reduce emissions from heavy-duty vehicles in
3252 this decade?

3253 *Dr. Pacala. So there are --

3254 *Ms. Matsui. Go ahead.

3255 *Dr. Pacala. Yes, there are 2 technologies that can be
3256 used to decarbonize heavy, heavy vehicles, and they are still

3257 in competition. Right?

3258 There are some developers that think that you can do
3259 this with batteries, even for long haulers, and that we can
3260 get charging rates down to low enough levels that you could
3261 do long hauling, interstate transport with big trucks.
3262 Almost everyone agrees now that, for routes less than 250
3263 miles, which includes a lot of the urban traffic you are
3264 talking about that leads to local air pollution, that
3265 probably can be done with batteries.

3266 The alternative is hydrogen fuel cells right now. And
3267 hydrogen fuel cells represent, you know, still -- there is a
3268 horse race. I think that, if I had to guess, I am going to
3269 guess batteries are going to win, but I wouldn't go to the
3270 market on that yet.

3271 *Ms. Matsui. Okay, well, I am running out of time, so
3272 thank you very much. I yield back. Thank you.

3273 *Mr. Rush. The gentlelady yields back. The chair now
3274 recognizes the gentleman from Indiana, Mr. Pence, for 5
3275 minutes.

3276 [Pause.]

3277 *Mr. Rush. Mr. Pence? Please unmute.

3278 [Pause.]

3279 *Mr. Rush. Mr. Pence, it seems as though you are muted.
3280 Mr. Pence, it seems as though you are muted.

3281 [Pause.]

3282 *Mr. Burgess. Mr. Chairman, perhaps we could go to Mr.
3283 Armstrong, and we will try to get Mr. Pence on.

3284 *Mr. Rush. The chair now recognizes Mr. Armstrong for 5
3285 minutes.

3286 *Mr. Armstrong. Thank you, Mr. Chairman.

3287 And Mr. Powell, I actually appreciated some of what you
3288 talked about, probably because I was the prime sponsor of the
3289 FAST Act legislation last session, and am going to introduce
3290 it again. And I know Ms. Castor is going after me, and I had
3291 the ability to serve on the Select Committee on the Climate
3292 Crisis with her. And one thing we heard from witnesses from
3293 all across the ideological spectrum is the interoperability
3294 and the interoperability of our grid is reliant on
3295 infrastructure.

3296 And regardless of what source of infrastructure that is,
3297 the permitting process, primarily with federal -- in federal
3298 areas has become so duplicative, burdensome, and just simply
3299 takes so long that it is very difficult to raise capital for
3300 that. So, if you could, just talk about that as part of
3301 making sure, regardless of which energy is getting on the
3302 grid, that we actually have an ability to do this.

3303 Because I am in North Dakota right now, and we obviously
3304 deal with these issues better than Texas. We know winter
3305 pretty well. But we have rolling blackouts as well right
3306 now, because of the strain on the grid, as a whole, from the

3307 Canadian border to the Gulf of Mexico.

3308 *Mr. Powell. Absolutely. So thank you so much for the
3309 question, Congressman. Thank you for your leadership on this
3310 really important issue.

3311 You know, we can only build clean energy as fast as we
3312 can permit it. And it doesn't really matter what your vision
3313 of a clean energy future is, whether it is something that is
3314 really, really highly renewable and requires an enormous
3315 amount of new transmission, and that kind of linear
3316 infrastructure along with a lot of really large land area
3317 developments, like very large wind farms or large solar
3318 plants, or if it is a vision of the future that has a much
3319 more compact, clean energy vision, like a lot of carbon
3320 capture plants on existing fossil facilities.

3321 But that probably requires more pipelines running around
3322 the country, taking that carbon dioxide away from those power
3323 plants. Or if it is a vision with a lot of hydrogen, that is
3324 going to require a lot of new hydrogen pipelines. Like,
3325 regardless, we are going to need to build a significant
3326 amount of new linear infrastructure in this country,
3327 thousands and tens of thousands of miles of this.

3328 I think the Princeton net zero study that Dr. Pacala was
3329 very influential in setting up the meeting has demonstrated
3330 that, kind of regardless of which clean energy future, we are
3331 going to need an enormous amount of this, going forward. And

3332 so it just cannot be the case that it takes a decade from
3333 the, you know, beginning of attempting to site a project to
3334 actually realizing steel in the ground between the NEPA
3335 reviews, the environmental impact statements, the traditional
3336 air and water permitting processes, and the local, state, and
3337 federal permitting processes along the way.

3338 I am not suggesting that we sacrifice the environmental
3339 reviews, or the environmental integrity of any of that, but I
3340 think we do need to find ways that we can do more things in
3341 parallel, as opposed to in sequence, and that we can get to
3342 yes and no answers much more quickly in these processes.

3343 *Mr. Armstrong. Yes, and I think actually, I mean,
3344 people talk about pipelines, we talk about transmission
3345 lines. The hardest thing to permit over a federal waterway
3346 is a highway. I mean, year in and year out, that is what
3347 takes longer than everything else.

3348 So, I mean, I will have plenty of time to fight with my
3349 colleagues about what sources of energy that are -- and we
3350 will probably go into it in the next minute and 45 seconds.
3351 But I think, realistically, we have to do a better job of
3352 protecting the environment, but getting permitting done.
3353 Otherwise, first of all, private capital is going to be
3354 chased away because the time constraints just take too long.
3355 And secondly, it is -- I mean, time value of money and energy
3356 are really important.

3357 But one of the other things I just wanted to talk about
3358 is when we talk about renewables versus other sources of
3359 energy, we don't talk about the economics of producing energy
3360 well enough. Because in North Dakota we do -- about 29
3361 percent of our grid is renewables. But over the last month,
3362 when it has been 20 below, it has dropped under 3 percent.
3363 And for a very windy state, it has been unquestionably calm.

3364 So coal and natural gas, between -- part of it -- and
3365 the other thing we don't talk enough about is primacy on the
3366 grid, which is where -- one of the ways where low natural gas
3367 prices are an advantage against coal, but where they really
3368 have an advantage against coal is being able to start up and
3369 scale down, depending on the amount of energy. And you have
3370 seen some of this in Texas in the last 2 days.

3371 So to oversimplify this in any way, shape, or form --
3372 but a coal plant or a natural gas plant has to be
3373 economically viable when they are at -- when -- in North
3374 Dakota, they are 70 percent of the grid because we need them
3375 when they are 97 percent of the grid. And we don't spend
3376 enough time talking about that.

3377 And I can just guarantee you, when we introduce a bill
3378 that somehow harms a wind subsidy in North Dakota, the reason
3379 every wind lobby is -- from across the country flies into
3380 North Dakota is not because they care about the environment.
3381 It is because it has become incredibly lucrative. And we

3382 have done policies where we allow people to sell energy onto
3383 the grid for less than it costs us to produce. And then,
3384 when we get into these severe weather actions, we run into
3385 resiliency problems and we run into reliability problems.

3386 And with that I will yield back.

3387 *Mr. Rush. The gentleman yields back. The chair now
3388 recognizes the gentlelady from Florida, Ms. Castor, with the
3389 aspirational background.

3390 We are all jealous of you, Kathy. You are recognized
3391 for 5 minutes.

3392 *Ms. Castor. Well, thank you, Chairman Rush. This is a
3393 very important and timely hearing, and I want to thank our
3394 witnesses today, as well.

3395 I am really thinking about all of the folks all across
3396 the State of Texas, and what they are going through. So we
3397 really have a responsibility to work together to ensure that
3398 this kind of thing doesn't happen again. The problem is
3399 these climate-fueled disasters are coming faster, and they
3400 are costing us more. So we have a lot of work to do together
3401 on this.

3402 To the witnesses, I wanted to ask you about some of the
3403 recommendations that we included last year in the big Select
3404 Committee on the Climate Crisis, our Solving the Climate
3405 Crisis report. They relate to resiliency in our electricity
3406 system and infrastructure.

3407 We recommended that we develop federal resilience
3408 standards for electricity infrastructure, authorizing DoE to
3409 identify and evaluate climate-related risks to the electric
3410 grid, in partnership with states and local communities in the
3411 private sector, and build in the priorities of consumers.

3412 We recommended that the Department of Energy, FERC, and
3413 NERC work with the Mitigation Framework Leadership Group to
3414 develop resiliency standards so that, when we are federally
3415 funding these infrastructure upgrades, they have to come
3416 along with appropriate standards.

3417 We also recommended improving planning and cost
3418 allocation for transmission lines, something that you all
3419 have discussed a little bit already, and helping states
3420 harden their physical grid infrastructure and improve
3421 maintenance to make the grid more resilient.

3422 Now, when we are talking about the modernization and
3423 expansion of the grid, the macrogrid in America, I would
3424 think that it would be wise, if we are making those kind of
3425 federal investments, that they have to be paired with these
3426 kind of resiliency priorities. I want to ask you all if you
3427 agree. And do you highlight one over the other?

3428 First, Dr. Pacala.

3429 *Dr. Pacala. I can be quick. I do believe that we need
3430 resiliency requirements as we develop the grid. Even if we
3431 didn't develop the grid to be more decarbonized, we need

3432 resiliency measures, additional resiliency measures.

3433 *Ms. Castor. Mr. Powell?

3434 *Mr. Powell. Absolutely, Congresswoman. But one thing
3435 I will note is I think storage could play a big role in this,
3436 if we thought of storage as a transmission asset alongside a
3437 distribution asset, and we have more ability to move energy
3438 and time, as opposed to just in space. I think that could be
3439 a really powerful part of this, as well, and could increase
3440 resilience.

3441 *Ms. Castor. Yes, and I think folks agree on that. And
3442 when we are looking at the economic recovery package, we want
3443 to do more on storage. I mean, my friends from the natural
3444 gas areas, remember, it was federal investments that led to
3445 the expansion of natural gas. And now it is time to mitigate
3446 the damage that climate change is doing, and help put the R&D
3447 into those cleaner sources of energy.

3448 Mr. Gordon, what do you think about these important
3449 resiliency requirements, having the Congress authorize new
3450 requirements directing the federal Department of Energy to do
3451 so, as we expand and modernize the grid across the country?

3452 *Mr. Gordon. Thank you, Congressman Castor. I think it
3453 is a great idea. We are -- we would be fully supportive of
3454 that.

3455 And just to clarify, I think you may have said that, "if
3456 the federal government is investing in a lot of the

3457 transmission infrastructure.'" And I think -- I am not sure
3458 if that was the intent, but the transmission system, by and
3459 large, is owned by private companies today. And it is a
3460 patchwork grid that wasn't really designed for the future
3461 that we have to plan for.

3462 And so what we do really need to do is make sure that
3463 the transmission-owning utilities are working in concert with
3464 each other, both regionally and interregionally, to make sure
3465 that electrons can flow seamlessly long distances in order to
3466 make sure that everyone has a higher degree of resiliency in
3467 the grid.

3468 *Ms. Castor. Well, I think we envisioned significant
3469 federal cooperation and investment and modernization and
3470 upgrading of the grid, and that has got to come in
3471 partnership with private utilities, public utilities, and the
3472 rest. And it would seem that we are on the cusp now, coming
3473 out of the COVID pandemic -- hopefully, soon -- and the
3474 economic turmoil that it has wrought, that this can be a
3475 source of hundreds of thousands of good-paying jobs in
3476 infrastructure and construction.

3477 And Dr. Pacala, I think the Academies -- in your report
3478 you focused a little bit on this. What is the potential
3479 here?

3480 *Mr. Rush. The gentlelady's time is up.

3481 *Ms. Castor. We will take that for the record.

3482 *Mr. Rush. All right.

3483 *Ms. Castor. Thank you very much --

3484 *Mr. Rush. The gentlelady yields back. The chair now
3485 recognizes Mr. Pence, who has returned on screen.

3486 Mr. Pence, you are recognized for 5 minutes.

3487 *Mr. Pence. Thank you, Mr. Chair. Can you hear me now?
3488 Thank you, Chair Rush and Republican Leader Burgess, for
3489 holding this hearing today. And thanks to the witnesses for
3490 your insight on decarbonization in the U.S. energy industry.

3491 Like many of my colleagues on this committee, I support
3492 an all-of-the-above approach to our energy supply and power
3493 generation. Access to abundant, reliable energy sources is
3494 beneficial for the customer, the economy, and for our
3495 national security and safety, as we are, unfortunately,
3496 seeing so drastically in Texas in the last few days.

3497 I agree with my friends across the aisle that renewables
3498 should play an important role in the future of our energy
3499 supply. Indiana's sixth district is doing its part to
3500 implement innovative clean energy technologies.

3501 North Vernon, Indiana was the first city government in
3502 the state to be entirely powered by solar energy. The street
3503 lights, buildings, traffic signals are all powered by
3504 locally-sourced solar energy.

3505 Cummins Engine Company -- just mentioned the over-the-
3506 road diesel emissions -- is located in my hometown in

3507 Columbus, Indiana. It is an international leader in heavy-
3508 duty electric engines. And in 2020 alone, Cummins won 5
3509 Department of Energy awards, the most of any company to
3510 advance production of fuel cell technologies. So, Doctor, I
3511 hope that one wins out.

3512 And in the State of Indiana, wind energy production has
3513 doubled over the past decade, accounting for 6 percent of
3514 energy produced in Indiana. Hoosiers do not have a top-down
3515 federal mandate to thank for this progress. This progress is
3516 attributed to improve economic costs and a free-market
3517 response to the growing demand for diverse energy production.

3518 It is in our best interest to support both the efforts
3519 to expand renewable energy capacity and access to fossil
3520 fuels like natural gas and coal. They provide robust
3521 baseload energy we need for a regional electric grid.

3522 As Mr. Camp mentions in his testimony, natural gas plays
3523 a critical role in local economic development, emissions
3524 reduction, and lower consumer utility bills. It is also a
3525 driver for good-paying manufacturing jobs that use natural
3526 gas for feedstock in the production process of plastics and
3527 chemicals in everyday consumer goods in the manufacturing,
3528 which is so important to the State of Indiana. We need a
3529 robust network of pipelines to extend those benefits to parts
3530 of the country that do not have locally-sourced supplies of
3531 natural gas.

3532 Before coming to Congress, I personally shipped through
3533 pipelines, rail, and trucking companies. I know firsthand
3534 that nothing is safer for the environment and human lives
3535 than the pipelines that move reliable sources of energy to
3536 every corner of our country. If we are serious about
3537 maintaining a reliable energy source and competitiveness, low
3538 prices for consumers, then a diverse energy supply is
3539 paramount.

3540 Mr. Powell, running along the Ohio River in Madison,
3541 Indiana the Clifty Creek Power Plant burns coal for
3542 electricity generation, producing enough energy to power a
3543 city of 1 million people. Since the plant was constructed in
3544 the 1950s, the Clifty Creek Power Plant has invested more
3545 than \$1 billion in environmental upgrades and efficiencies.

3546 Congress passed several provisions in the omnibus bill
3547 relating to clean coal innovation, including the 45Q tax
3548 credit extension for carbon capture, as well as demonstration
3549 programs to explore alternative uses for coal. Mr. Powell,
3550 can you speak to the importance of these provisions, and how
3551 the Biden Administration can approach the implementation in
3552 accordance with congressional intent?

3553 *Mr. Powell. Absolutely. Thanks so much, Congressman,
3554 thank you for your attention to these issues, this important
3555 support for carbon capture technology.

3556 For facilities like the one you are discussing, I think

3557 the important thing now is, first, demonstrating that we can
3558 bring down the cost of coal carbon capture technology. So
3559 that is the first thing that DoE needs to do. Right now 45Q
3560 isn't quite enough to probably justify putting carbon capture
3561 on those facilities. We need to bring the price down a
3562 little further.

3563 And so the demonstration program set up at DoE will now
3564 authorize public-private partnerships to do more
3565 demonstrations on facilities like yours to capture those
3566 emissions in cost share with private-sector players and with
3567 private-sector utilities. So I think that is the first
3568 thing.

3569 And then, once we have brought the cost down further to
3570 where it is more economic, 45Q hopefully will be able to take
3571 over. We may need to think about further extensions of 45Q
3572 in the future to continue helping support that technology and
3573 that deployment.

3574 *Mr. Pence. Thank you, I yield back.

3575 *Mr. Rush. The gentleman yields back.

3576 Mr. Pacala, you asked that you be excused at 2:45. Do
3577 you still need to be excused from the hearing?

3578 *Dr. Pacala. Well, I do have a National Academies
3579 webinar with 3,000 people signed up that starts at 3:00, and
3580 they can soldier on without me if I am needed. But if not,
3581 then I am happy to make that gig.

3582 *Mr. Rush. So if -- we would love for you to continue
3583 as a witness, but you have to make the call. Do you need to
3584 be excused?

3585 *Dr. Pacala. Yes, that would be best.

3586 *Mr. Rush. Well, we thank you, Mr. Pacala, for your
3587 time. You have really made this hearing worthwhile, very
3588 interesting, and we certainly appreciate all your
3589 contributions to this area.

3590 *Dr. Pacala. I want to thank you, Chairman Rush, and
3591 every member of the committee for your service in the
3592 nation's interest. There is no more important issue today
3593 than the one that you are in charge of. So thank you.

3594 *Mr. Rush. All right, very good. You are excused. And
3595 now the chair recognizes the gentleman from Vermont for 5
3596 minutes for questioning.

3597 Mr. Welch, you are recognized for 5 minutes.

3598 *Mr. Welch. Thank you. Thank you very much, Mr.
3599 Chairman.

3600 First of all, I want to say one of the best experiences
3601 I had in Congress was going to a coal mine in West-by-God
3602 Virginia with David McKinley. And Vermont is not coal
3603 country, but I got to tell you I really admired those
3604 hardworking coal miners who kept the lights on in our barns
3605 and schools for so long.

3606 And I want to say to Mr. Camp I really admire the

3607 hardworking folks that you are here representing. So
3608 whatever it is we do, there has to be enormous respect paid
3609 to people who have been, really, the pioneers and the hard
3610 workers in keeping our lights on, keeping our economy going.

3611 But having -- there is also something that Mr. -- I
3612 think Mr. Powell said: disruption is happening. And many of
3613 our major utilities have adopted zero emission goals. So
3614 whether it is market forces, whether it is business changes,
3615 whether it is the awareness of climate change and carbon
3616 emissions playing a big role in that, change is here.

3617 And I think the challenge for us is to come up with
3618 pragmatic policies that are all-of-the-above approach to
3619 addressing the changes that we need. But as we do it, never
3620 forget the people who have contributed. And we have to
3621 acknowledge that there is some disruption, and we have got to
3622 mitigate that for communities that are affected.

3623 One of the approaches that makes a lot of sense for me
3624 is energy efficiency. And Ms. Glover, I want to ask you --
3625 congratulations on your position, I really appreciate your
3626 leadership, and -- of the Alliance. But we have some
3627 bipartisan bills in this legislature, in this committee: the
3628 Main Street Efficiency Act, and the HOPE for HOMES
3629 legislation. Could you comment on, A, efficiency; and B, why
3630 those 2 pieces of legislation would be helpful?

3631 *Ms. Glover. Excuse me, I didn't realize I was muted; I

3632 apologize. Thank you, Congressman, for your leadership and
3633 for that question.

3634 You know, the Main Street Efficiency Act is particularly
3635 important to us, and we really do appreciate, you know, your
3636 leading on that, because it does allow small businesses to
3637 have a place in this conversation, and they have a role that
3638 they can play. And as we talk about economic recovery for
3639 our country, and the importance of small business, we believe
3640 that the Main Street Efficiency Act and giving grants not
3641 only to small businesses and particularly those in distressed
3642 communities and minority-owned businesses so that they can
3643 better improve the efficiency of their own spaces, whether
3644 that is building efficiency and/or maybe even manufacturing
3645 processes, but at the same time supporting small businesses
3646 to be able to do that work is a double win.

3647 Additionally, we also believe that investments in homes
3648 and retrofits so that they are more efficient is also a
3649 double win. It is a win in that it allows people to save
3650 money, it allows us to save energy in our use on the grid and
3651 builds resilience, but it also can be a really big economic
3652 driver. The cost to enter the efficiency spaces of small
3653 business, it is a low barrier. It is not like other areas,
3654 other sectors of the industry. And so anything that we can
3655 do to not only encourage small businesses and residents to
3656 take advantage of these opportunities to participate, as well

3657 as take advantage of what it provides is a really good --

3658 *Mr. Welch. That is great, thank you. Because that --
3659 it is local control, business control, homeowner control,
3660 community control, community jobs.

3661 Let me ask Mr. Gordon. The Administration has a goal of
3662 clean energy by 2035. Representative Clarke and I have
3663 introduced a renewable energy standard which would have as a
3664 goal 55 percent renewable by 2030. We have heard how
3665 absolutely important it is for our generation folks to have
3666 some reliability. How would a 10-year renewable energy
3667 standard, combined with a clean energy standard, allow for
3668 certainty of the electrical generator community? And how
3669 would that help us with a clean energy economy?

3670 *Mr. Gordon. Thank you, Congressman Welch, for that
3671 question.

3672 I think, as you point out, business certainty is huge
3673 for major infrastructure investments. And so having a 10-
3674 year program, whether it is a clean energy standard or a
3675 renewable energy standard, gives us the certainty we need to
3676 know that customers are going to be buying for that period of
3677 time, at a minimum.

3678 And normally what happens, as soon as they start buying
3679 a little, they start buying a little bit more, because the
3680 economics are so positive for them and for their customers.
3681 And so I think just giving a little nudge to the market

3682 through programs like this really gets the ball moving.

3683 And I think, you know, what we have seen is massive
3684 interest, you know, over the last 5 years from, historically,
3685 the biggest coal utilities in the country: the American
3686 Electric Powers, for instance, they are going big on wind
3687 right now. So all it takes is a nudge. You get the policy
3688 direction set, you give the certainty to the investors and
3689 the developers because these projects take 5 to 7 years to
3690 develop, and you have got to get them onto the grid, which
3691 can take even more time and more money.

3692 So we need that long horizon in order to make those type
3693 of investments.

3694 *Mr. Welch. Thank you very much.

3695 Thank you, Mr. Chairman. I yield back.

3696 *Mr. Rush. The gentleman yields back. The chair now
3697 recognizes Mr. Schrader for 5 minutes. I don't see any
3698 additional Republican members -- I am sorry.

3699 Mr. Palmer, you are recognized for 5 minutes.

3700 *Mr. Palmer. Thank you, Mr. Chairman. I am sitting way
3701 out here to your right, so it may have made me hard to see.
3702 I yield to the gentleman from Texas, Mr. Burgess, for -- may
3703 consume.

3704 *Mr. Burgess. I thank the gentleman for yielding and,
3705 of course, Mr. Palmer, here to the right of all of us, so
3706 that is no great surprise.

3707 So Mr. Powell, you are still here. Let me ask you a
3708 question. I tried to ask you one earlier, and it got taken
3709 by another witness. But that is okay. I got a good answer,
3710 so it gave me something to work on. But you talked about the
3711 45Q tax credit. Are you familiar with Petra Nova Coal Plant
3712 in Houston, and the fact that it has been closed since
3713 September because it could not meet the operating costs, or
3714 the operating costs were -- exceeded any ability for it to
3715 meet those because of the reduction in energy prices that
3716 occurred with the COVID pandemic?

3717 So could you speak to that issue? It -- right now it
3718 just seems criminal that that plant is shuttered with the
3719 state so badly needing electricity. And granted, it is in
3720 the southern part of the state, but every little bit helps
3721 right now. But could you speak to that?

3722 *Mr. Powell. Sure. Absolutely, Congressman. And it
3723 certainly does seem tragic at the moment that, you know, not
3724 just a coal-fired power plant, but a coal-fired power plant
3725 operating with very low emissions is not running, you know,
3726 at this very moment of kind of energy scarcity in the state.

3727 You know, to take a big step back on Petra Nova, I think
3728 we should all remember that was a demonstration project, and
3729 it worked as intended, so it clearly demonstrated host
3730 combustion carbon capture on a coal-fired power plant.

3731 [Audio malfunction.]

3732 *Mr. Powell. It has worked very well at sequestering
3733 more than 2 million tons, it put it safely underground into
3734 an -- used it for -- recovery.

3735 Overall, the economics of the project worked, even in
3736 the absence of --

3737 [Audio malfunction.]

3738 *Mr. Powell. It wasn't able to capture those 45Q -- it
3739 wasn't able to capture those 45Q benefits. It was able to
3740 capture some of the revenues from the enhanced oil recovery
3741 project that it was associated with. But unfortunately,
3742 when, you know, the COVID pandemic hit, oil prices crashed,
3743 and all gas prices crashed, as well, in Texas and the gas-
3744 fired production is so expensive it just no longer made sense
3745 to run that plant.

3746 So you know, I think it worked very well as a technical
3747 demonstration. And now we need to go forward with the next
3748 generation of combustion capture to bring that price down a
3749 little bit further. And then, those would also be -- 45Q --
3750 it probably would be a lot closer to an economic operation if
3751 you were to, say, do a Petra Nova --

3752 *Mr. Burgess. Right. Well, when we were working on one
3753 of the coronavirus response packages last summer that didn't
3754 actually get passed into law, I worked with Senator Cornyn
3755 here in Texas to get extension of the 45Q tax credit, and I
3756 also worked with Mr. Crenshaw to get that extended to natural

3757 gas generating facilities.

3758 But it seems to me that having the stability of that --
3759 I mean, that credit is going to expire. So it makes it
3760 harder to plan a big capital-intensive project like that if
3761 the tax credit is going to evaporate. So it just seems to me
3762 -- and again, maybe we will get a chance to revisit this with
3763 one of the coronavirus response things. We haven't so far
3764 had any ability for bipartisan input. But Mr. Cornyn and I -
3765 - or Senator Cornyn and I, our contribution last summer was
3766 to extend this 45Q tax credit to provide perhaps a little bit
3767 more stability for major projects like this.

3768 And I just think that is such an important part of this,
3769 and we can't lose sight of it. We have got the technology.
3770 We are doing what everyone asked us to do: produce
3771 electricity with coal with zero -- near zero emissions and,
3772 as you correctly point out, the enhanced oil field recovery
3773 on the other side of it. It really was a win-win-win
3774 proposition. And again, right now, tragically, it is
3775 shuttered and not contributing to the very necessary baseload
3776 of electricity in Texas.

3777 So just in general, and the question that I had asked
3778 earlier that kind of got taken up by another witness, but
3779 just in general, your thoughts on decarbonization,
3780 renewables, resiliency of the grid -- in short, could you
3781 summarize that?

3782 *Mr. Powell. Absolutely. I think -- let's take the
3783 Texas example. I think what we have seen very clearly is
3784 that we need a more resilient grid with a mix of resources.

3785 I think there are a number of highly-resilient, advanced
3786 technologies that could help in situations like this, and
3787 they could help companies grids all over the country when
3788 they are going to be dealing with situations like this --
3789 [Audio malfunction.]

3790 *Mr. Powell. -- carbon capture, that is enhanced
3791 geothermal, and that is energy storage, so that we can take
3792 the great low-cost energy from wind and solar, and then we
3793 can move it around through time, right, because that is a
3794 more variable energy source. So I think technology can be a
3795 big answer in all of this.

3796 But the real key is that we need a broad portfolio, a
3797 really resilient mix. We don't want to have all our eggs in
3798 any one or a few baskets in this. We need a lot of options,
3799 especially because, if we are going to have different parts
3800 -- we are going to be --

3801 [Audio malfunction.]

3802 *Mr. Powell. -- extreme weather.

3803 *Mr. Burgess. Great answer, I appreciate that.

3804 Mr. Chairman, if I may, I would -- I do need to point
3805 out that one of the hazards of an interconnected grid is that
3806 problems can spread more rapidly. And we need to bear that

3807 in mind, as well.

3808 And I will yield back.

3809 *Mr. Rush. The acting ranking member yields back. The
3810 chair now recognizes Mr. Schrader for 5 minutes.

3811 *Mr. Schrader. Thank you very much, Mr. Chairman. I
3812 really appreciate this hearing. It is certainly timely, and
3813 I agree with folks that this is going to be, hopefully, one
3814 of the signature efforts of this particular Congress, as we
3815 get, hopefully, on the other side of this COVID epidemic.

3816 And my heart goes out to the folks in Texas and that
3817 part of the Midwest and South that are really getting hit by
3818 this terrible freezing cold weather. But I will point out to
3819 everybody my district has also, unfortunately, been in the
3820 throes of a once-in-a-century ice storm in the mid-Willamette
3821 Valley here in Oregon, and it has put hundreds of thousands
3822 of folks out of power. I got my power back yesterday, 5 days
3823 without heat, water, you know, just the ability to do pretty
3824 much anything. My fireplace came in handy. But it showcases
3825 and headlines, I think, some of the problems that we face out
3826 here.

3827 Ours in the Pacific Northwest wasn't the result of
3828 frozen pipelines, but it was downed power lines with the
3829 trees. It points out, I think, we need to do a serious
3830 vegetative management and pursue some of the new federal
3831 policies this Congress and previous Congresses have put in

3832 place over the last several years to effectively harden our
3833 grid, if you will, just by minimizing some of the power
3834 problems that we are going to have due to overhead power
3835 lines.

3836 I just would say also -- I think it goes for every
3837 member on this panel -- I want to thank all the line crews.
3838 The efforts that these men and women have put in going 24/7,
3839 18-hour shifts, certainly in my mid-Willamette Valley, and I
3840 am sure it is true down in Texas, too, that they have done
3841 everything they can, trying to get Oregonians and Texans back
3842 online. So I really want to call that out, and appreciate
3843 their work.

3844 I guess I question -- well, a comment. I just agree
3845 with Congressman Welch and the work that Ms. Glover's power
3846 alliance is doing. I think that is critical. Energy
3847 efficiency is probably the least expensive, most efficient --
3848 no pun intended -- way to get reduction in carbon emissions
3849 and compliance with all our folks out there.

3850 But I was going to ask Mr. Gordon if he could talk, with
3851 the transmission line problems that we are having, the
3852 pipeline problems, could you talk a little bit about what
3853 does it mean to harden the grid, how do you have redundancy,
3854 what role putting power lines underground plays, and how
3855 economical all that is?

3856 Everyone wants to talk about building another plant, or

3857 doing more renewable, but there is a certain amount of just
3858 getting the transmission redundancy, I assume, that needs to
3859 occur. Could you comment on that?

3860 *Mr. Gordon. Thank you, Congressman Schrader. Yes, it
3861 is absolutely the case. What we need to harden the grid will
3862 be more high-voltage transmission lines, so that if one line
3863 trips off or is taken out by a tree, that there is redundancy
3864 in the system, which obviously improves the resiliency of the
3865 grid and hardens the grid. So, I mean, absolutely, that is
3866 imperative.

3867 As you might know, there is not a lot of public support
3868 for new transmission lines, so it is a tough one. You know,
3869 it is going to be the Achilles heel of making this transition
3870 happen, because what really needs to happen is more of these
3871 lines in order to harden the grid. Burying the lines is an
3872 option in some cases. The costs are higher, as well. So
3873 that has to be taken into consideration, of course.

3874 So there is no one easy solution, from a cost
3875 standpoint. But I think the solution from a technical
3876 standpoint is fairly clear.

3877 *Mr. Schrader. I appreciate that. Maybe a role of
3878 Congress could be to incentivize some of the landowners to
3879 allow some of these transmission lines to go over or under
3880 their properties.

3881 Mr. Powell, what is the proper balance? We talked a

3882 little bit about our role in the United States and other
3883 governments, about global -- you know, globally balancing
3884 out, what is America's role, and how do we engage others to
3885 do their fair share.

3886 *Mr. Powell. Thanks very much for the question,
3887 Congressman, and thanks for your leadership on the energy
3888 innovation topic, broadly.

3889 It is a delicate balance. You know, when we think about
3890 some of these very aggressive goals, even some of the
3891 voluntary goals that have been made in the United States, the
3892 net zero goals, we do have to acknowledge those things are
3893 going to come with a cost, in all likelihood. And, you know,
3894 there may be near-term opportunities for cost savings, but it
3895 probably will mean more cost in the future. And that is why
3896 innovation is so important, because it can help drive down
3897 the costs of compliance. So hopefully we don't lose too much
3898 to American competitiveness and jobs during that period.

3899 And of course, if we don't drive down the costs, then we
3900 are not going to have the things to export to the rest of the
3901 world that it will take so many other -- you know, Nigeria,
3902 Indonesia, the rapidly developing world, they don't have the
3903 rich resources that the United States does. They are making
3904 their decisions about building up their economies almost
3905 entirely on the basis of the lowest-cost, nearest-term
3906 opportunities. So unless we give them better opportunities

3907 to decarbonize their grids, as well, they are very unlikely
3908 to take them on.

3909 So I think it is a delicate balance, and it really
3910 highlights the need for innovation to drive down costs and
3911 improve performance.

3912 *Mr. Schrader. Thank you very much. I hope American
3913 innovation and technology can contribute to that solution.

3914 And I yield back, Mr. Chairman, thank you.

3915 *Mr. Rush. The gentleman yields back. I seem to have
3916 lost my visual, but can you hear me?

3917 Can you hear me?

3918 *Voice. Yes, Mr. Chairman, loud and clear.

3919 *Mr. Rush. All right, Ms. Kuster, you are recognized
3920 for 5 minutes.

3921 *Ms. Kuster. Thank you very much, Mr. Chairman, and I
3922 wanted to, at the outset, insert into the record, if I could,
3923 2 articles: the first from the Texas Tribune, "Texas largely
3924 relies on natural gas for power. It wasn't ready for the
3925 extreme cold''; and the second, the New York Times article
3926 entitled, "How to Prevent the Next Texas Power Breakdown.'' So I would seek permission to insert those into the record.

3928 *Mr. Rush. Hearing no objections, so ordered.

3929

3930

3931

3932 [The information follows:]

3933

3934 *****COMMITTEE INSERT*****

3935

3936 *Ms. Kuster. Thank you, Chairman Rush and Acting
3937 Ranking Member Burgess, for holding this important hearing
3938 today. I am excited to be returning to the Energy
3939 Subcommittee and continuing our work across the aisle to
3940 advance policies to tackle climate change and advance clean
3941 energy solutions.

3942 I believe that the federal government must take bold
3943 action to invest in clean energy to achieve net zero carbon
3944 emissions because it is good for our health, it is good for
3945 the planet, and it will create millions of good-paying green
3946 jobs.

3947 As a recent National Academy of Sciences report found,
3948 the transition to net zero could provide quality jobs and
3949 economic benefits for American workers. One form of carbon-
3950 free energy that is ripe for expansion is hydropower. A 2016
3951 DoE report outlined U.S. hydropower production could grow up
3952 to 150 gigawatts in 2050, producing enough carbon-free energy
3953 to power 36 million homes. We don't need to build new dams
3954 to achieve this goal. The Federal Energy Regulatory Energy
3955 Commission has already identified hundreds of dams, including
3956 4 in my district, that could be safely retrofitted to
3957 generate hydropower.

3958 Mr. Gordon, my first question is for you. Would
3959 retrofitting, rehabilitating, and removing dams create
3960 quality jobs and help to decarbonize the energy system?

3961 *Mr. Gordon. I am sorry, Congressman Kuster, can you
3962 repeat the question?

3963 *Ms. Kuster. Sure. Would retrofitting, rehabilitating,
3964 and removing dams create quality jobs and help to decarbonize
3965 the energy system?

3966 *Mr. Gordon. So our company does not operate in the
3967 hydro sector, so I am not sure I am qualified to answer that
3968 question.

3969 *Ms. Kuster. Okay. Is there anyone else on the panel
3970 that wants to take a crack at that? If not, I will move on.

3971 *Mr. Powell. I would be happy to, Congresswoman.

3972 *Ms. Kuster. Sure.

3973 *Mr. Powell. Thank you for your attention to this
3974 issue. We have got an enormous potential in retrofitting
3975 non-power dams in this country, literally thousands of
3976 potential opportunities for that. And I think there was just
3977 an important announcement between the National Hydro
3978 Association and American Rivers, where basically the
3979 conservation community and the hydropower community are
3980 coming together with some joint proposals about places where
3981 perhaps older, or non-used dams could be removed, and other
3982 non-power dams could be powered up, and so we could have a
3983 real win-win on conservation and producing more clean
3984 electricity. I think that there is an enormous opportunity
3985 there.

3986 *Ms. Kuster. Terrific. Well, I am a big fan of that
3987 approach, and I am a -- I know well Dan Reicher, formerly of
3988 the Department of Energy, who was involved in that
3989 negotiation. So thank you for bringing it up.

3990 What I am interested in is, while I am a strong
3991 supporter of taking steps to reach net zero emissions, I
3992 believe we should also pursue negative-emission technologies
3993 that remove carbon directly from the atmosphere. And my time
3994 is short, so I am going back to Mr. Gordon, but if someone
3995 else would like to respond, can you speak to the role that
3996 negative-emissions technologies have to play to help the
3997 planet achieve net zero emissions?

3998 *Mr. Gordon. Congressman Kuster, again, I am sorry, I
3999 am not informed on that topic --

4000 *Ms. Kuster. All right. Anyone else want to take a
4001 stab at that?

4002 *Mr. Powell. I am happy to also add, Congressman
4003 Kuster, and I apologize for the siren behind me here. But
4004 negative-emission technologies, I think, could play an
4005 enormous role in this space. Most of the models of the
4006 future of decarbonized energy systems show that we will need
4007 to rely on, you know, perhaps around the world, billions of
4008 tons of this negative-emission technology. That could take a
4009 number of forms. That could take the form of mechanical
4010 devices, which capture things directly from the atmosphere.

4011 That could take the form of better forestry and soil
4012 management practices, where foresters and farmers could be
4013 compensated for pulling this out of the atmosphere. It could
4014 even take the form of ocean approaches, where we either grow
4015 more plants in the ocean, or do things to the ocean so that
4016 they become more of a sink for carbon dioxide.

4017 A ton of innovation is needed in this space. DoE is
4018 just getting started, and the broader federal energy
4019 innovation apparatus is just getting started. The private
4020 sector is also leading the way. You have seen major
4021 commitments from Microsoft, and Amazon, and a number of other
4022 major technology producers that are really investing deeply
4023 in this space, as well. So I think it is a space with a lot
4024 of movement.

4025 It is very early days, and it remains very expensive.
4026 Currently we need to focus on bringing the cost far, far down
4027 so it could be a real part of the mix.

4028 *Ms. Kuster. Great. Thank you, Mr. Powell. My time is
4029 up, and I will yield back. Thank you for your expertise.

4030 *Mr. Rush. I thank the gentlelady for yielding back.
4031 The chair's screen is frozen, and my time -- my clock is
4032 frozen, also. So -- but the audio is -- I can hear you. The
4033 audio is working fine. So the chair now recognizes Ms.
4034 Barragan for 5 minutes.

4035 And Ms. Barragan, you are recognized for 5 minutes.

4036 *Ms. Barragan. Thank you, Chairman Rush, for this
4037 important hearing on solutions to reach a 100 percent clean-
4038 energy economy. We have seen the deadly cost associated with
4039 the fossil fuel industry through extreme weather events
4040 influenced by climate change. Whether it is record wildfires
4041 in California or a polar vortex in Texas, we cannot drill,
4042 mine, or frack our way out of the climate crisis.

4043 Instead, we need a massive investment in clean energy,
4044 energy efficiency, and battery storage combined with
4045 modernizing our grid for this century's challenges. By
4046 prioritizing these investments in environmental justice
4047 communities, we can have a transformational impact on our
4048 economy and our climate.

4049 Mr. Chair, I would like to submit for the record a
4050 February 16, 2021 article from The New York Times entitled,
4051 "Texas Blackouts Hit Minority Neighborhoods Especially
4052 Hard.' '

4053 *Mr. Rush. So ordered.

4054 [The information follows:]

4055

4056 *****COMMITTEE INSERT*****

4057

4058 *Ms. Barragan. Thank you, Mr. Chair.

4059 Ms. Glover, I would like to start with you. It is
4060 critical for there to be racial equity in the new jobs
4061 created from our transition to clean energy. In California
4062 Latinos make up 34.4 percent of California's workforce, yet
4063 only 21.8 percent of the energy efficiency industry. Black
4064 workers are 9.8 percent of the workforce, yet only make up
4065 7.3 percent of the energy efficiency industry. How can the
4066 energy efficiency industry do more to prioritize minorities
4067 for training and support to enable them to obtain employment
4068 in energy efficiency business?

4069 *Ms. Glover. Thank you, Congresswoman, for that
4070 question, and I appreciate your leadership.

4071 You know, through the summer the Alliance and the
4072 members of our coalition really started to talk very deeply
4073 about equity and the concerns of under-represented
4074 communities, and how we could do better. And we adopted a
4075 set of principles that would guide us, not only in our
4076 advocacy positions, but also we are working to support our
4077 companies and those that are part of our coalition.

4078 They are all really focused on trying to figure out how
4079 do they better attract people of color to their business, how
4080 do they reach out to them better, do a better job of that,
4081 identify those types of opportunities that people would be
4082 interested in and encourage them to participate.

4083 But additionally, we are looking at who our partners
4084 should be who are already in these communities, who can
4085 really provide us the kind of guidance and direction that we
4086 need. And I would suggest that, you know, the entire
4087 industry in some way is thinking about these problems and
4088 trying to figure it out. But we do need the help of leaders
4089 as yourself, such as yourself, as well as others in our
4090 communities to help us do the right thing the right way.

4091 And what I mean by that is address the concerns of the
4092 community in a way that they see them, and also make sure
4093 that we are encouraging investment in those communities so
4094 that, as you stated, they are also getting, not just jobs --
4095 I think jobs and for people to be employed is a great thing,
4096 but we have lots of entrepreneurial minds in our communities
4097 and people who have the ability to grow great businesses in
4098 terms of energy efficiency, and we want them to be a part of
4099 this industry and use that talent so that we can spread the
4100 work that we do throughout the country --

4101 *Ms. Barragan. Thank you.

4102 *Ms. Glover. -- quite frankly.

4103 *Ms. Barragan. Thank you so much, Ms. Glover.

4104 Mr. Gordon, when I listen to my colleagues on the
4105 Republican side, they repeatedly talk about electricity
4106 prices being a consequence of the transition to a cleaner,
4107 healthier energy future. However, over the past 10 years the

4108 cost of wind power has dropped by 70 percent, solar power
4109 costs are down by 90 percent, and lithium ion batteries are
4110 -- for energy storage are -- and electric vehicles are down
4111 by 85 percent.

4112 Is the argument that clean energy is too expensive based
4113 in reality or outdated?

4114 *Mr. Gordon. Thank you for your question,
4115 Congresswoman. I think that is a very good question, and you
4116 are right to state the facts. The cost of new wind, new
4117 solar, new battery storage have declined significantly over
4118 the last 10 years. And so, when you are comparing, you know,
4119 the building of a new gas plant versus a new wind plant
4120 versus a new solar plant, wind and solar are competitive with
4121 both of those. And if you look at the stats, there is not a
4122 single coal plant being built in the United States in the
4123 contiguous 48 right now.

4124 On the other hand, you have significant builds in wind
4125 and solar. It is because the costs have come down so much
4126 that the utilities who own both renewables, nuclear, coal,
4127 gas, they see the future is very -- that is very clear to
4128 them, and it is going to be dominated by renewables. And so
4129 they are just making that move right now because of the
4130 costs.

4131 *Ms. Barragan. Well, thank you for that. One thing we
4132 don't talk enough about is the cost of the impact on health

4133 and negative health impacts. And with that, Mr. Chairman, I
4134 yield back.

4135 *Mr. Rush. The gentlelady yields back. I just want to
4136 remind members I am having a technology problem. My screen
4137 is frozen, my clock is frozen. My audio is working just
4138 fine, so I am going to ask members -- you know, I can't see
4139 the clock, so please be mindful of the fact that, when your
4140 time is up, bring your questions to a conclusion.

4141 The chair now recognizes for 5 minutes the gentleman
4142 from Virginia, Mr. McEachin, for 5 minutes.

4143 [Pause.]

4144 *Mr. Rush. Mr. McEachin?

4145 [Pause.]

4146 *Mr. Rush. The chair now recognizes the gentlelady from
4147 Delaware, Ms. Blunt Rochester, for 5 minutes.

4148 *Ms. Blunt Rochester. Thank you so much, Mr. Chairman,
4149 for calling this important hearing. And I want to thank the
4150 witnesses, not only for your testimony, but for your
4151 perseverance.

4152 I hear every day from my constituents in Delaware about
4153 the impacts of climate change that are -- that they are
4154 already facing, whether it is the rising sea levels that
4155 flood our beaches, the changing seasons impacting our farmers
4156 in Delaware, or the extreme heat that endangers our most
4157 vulnerable citizens.

4158 This week's extreme weather event in Texas and parts of
4159 the Midwest has highlighted the importance of investing in
4160 energy resilience. We need to work together to create a more
4161 climate-resilient energy system. We need to be better
4162 prepared for future emergencies to better protect our
4163 constituents, which is why I introduced the Open Back Better
4164 Act last year, and why I plan to reintroduce it in the
4165 upcoming weeks.

4166 As we start to rebuild our economy from the ongoing
4167 public health pandemic, we need to be intentional. The Open
4168 Back Better Act invests in retrofits to ensure that our
4169 nation's critical infrastructure, such as hospitals,
4170 libraries, and community centers are safer, cleaner, more
4171 energy efficient, and more resilient against future threats,
4172 while creating good-paying jobs and prioritizing those
4173 communities hardest hit by the COVID-19 pandemic. These
4174 upgrades are critical to low-wealth communities and
4175 communities of color, which are so often disproportionately
4176 burdened by the impacts of public health emergencies and
4177 national -- natural disasters.

4178 My questions are for Ms. Glover.

4179 First, Ms. Glover, I want to thank you and the coalition
4180 for all of your hard work, and also your leadership and
4181 support for the Open Back Better Act. As you referenced in
4182 your written testimony, the Open Back Better Act helps to

4183 retrofit mission-critical buildings throughout the country.
4184 Can you please expand on why these efforts are so important,
4185 especially to low-wealth communities and communities of
4186 color?

4187 And how do we ensure that resiliency efforts include all
4188 communities?

4189 *Ms. Glover. Sure. Thank you so much, Congresswoman,
4190 for the question and for your leadership on this issue.

4191 You know, I think, as we start to think about buildings
4192 in particular, and the importance that they place, a lot of
4193 the conversation that we have had over the last 6 months
4194 around equity is really focused on underinvestment or non-
4195 investment. And so it is really important for those
4196 communities that are the most disadvantaged that we start
4197 investing them -- in them first.

4198 And buildings -- and retrofitting buildings is a great
4199 way to do that, and an important way to do that, one, for
4200 those communities, particularly when we are talking about
4201 public buildings, being able to save money for localities on
4202 their energy costs -- and they can redirect those funds to
4203 other things that they have to take care of is one thing that
4204 this would do.

4205 Secondly, as you mentioned, the opportunity for jobs is
4206 a big one, right? And we are talking about not just a job on
4207 one building, but we are talking about giving people skills

4208 that they can carry on to do that work in all kinds of ways.
4209 And we are not talking about just college education jobs, but
4210 also blue jobs, green jobs, however you would like to
4211 describe them. And we are talking about giving people skills
4212 that are going to allow them to sustain themselves and their
4213 family over the long haul.

4214 And thirdly, I think, is an opportunity to give a
4215 demonstration to the community at large about why efficiency
4216 is important, what it can do for you. People get to see it
4217 in ways that they may not -- even if they can't see behind
4218 the walls, they see the effective impact of that work in
4219 their schools, in their mayor's offices, et cetera, and their
4220 hospitals.

4221 And so I think, you know, for all of those reasons, this
4222 work is critically important, and we have an opportunity to
4223 do it now. And if we are going to transition, we need to
4224 take care of these communities first, and we need to do it
4225 now.

4226 *Ms. Blunt Rochester. Excellent. Can you also tell us
4227 how Congress can help alleviate any real or even perceived
4228 risks for businesses and industries as we accelerate
4229 transition to a clean energy economy?

4230 *Ms. Glover. I think the -- what Congress can do is to
4231 think about what businesses are really needing now, and
4232 address those needs. And that means hearing from people.

4233 A lot of what we learned with how we were trying to help
4234 small business, particularly out of the pandemic, what we
4235 learned sometimes is that the rush to put money out there
4236 sometimes doesn't hit the people that you want. And so I
4237 appreciate all of your deliberative efforts to make sure that
4238 what you are putting out into the market in terms of funding
4239 is very specific, and is going to hit the communities and
4240 intended -- that you intend.

4241 And I just think that, in terms of energy efficiency, as
4242 we said, 99 percent of the energy efficiency job -- 99
4243 percent of the jobs -- well, no, all the jobs happen in 99
4244 percent of the counties across this country. That means we
4245 are all impacted by it, and we should do something with that.

4246 *Ms. Blunt Rochester. Thank you so much, and I yield
4247 back the balance of my time. Thank you.

4248 *Mr. Rush. The gentlelady yields back. The chair now
4249 recognizes Mr. O'Halleran for 5 minutes.

4250 *Mr. O'Halleran. Thank you, Mr. Chairman, and the
4251 panel, and also the members on the committee for the
4252 outstanding discussion today. It was a broad view of what
4253 the discussion is going to be for the next year, number of
4254 years.

4255 The energy industry has changed significantly in the
4256 last decade, as we all know. Electricity from coal has
4257 declined, our nation has become energy independent, and

4258 renewable energy technologies have put our nation on the path
4259 to continued carbon emission restrictions -- reductions, I am
4260 sorry.

4261 My district is facing the brunt of the transition away
4262 from coal. As major plants continue to close, workers are
4263 laid off, and local economies are hurt. It is essential that
4264 new federal policies provide equality and opportunity for
4265 rural communities that are too often left behind. As the
4266 Biden Administration pursues its robust climate agenda, I
4267 look forward to putting forward bipartisan climate proposals
4268 that support innovation and energy security.

4269 I will soon be introducing comprehensive legislation,
4270 the new Promise Act, to put impacted coal communities in the
4271 driver's seat, with economic development support for their
4272 economies and workers, mitigate the tax revenue losses, major
4273 plant closures that cost those -- cause local economies to
4274 have impact, empowers workers, and more, including job
4275 training.

4276 Dr. Powell -- or Mr. Powell, I am sorry -- I appreciate
4277 your testimony highlighting the need for pragmatic policies
4278 to support in impacted communities and workers in the energy
4279 transition. Part of my legislation will authorize grant
4280 funding for communities to respond and repurpose coal-fired
4281 facilities for new energy production, manufacturing, and
4282 other proposal purposes. Could you comment on how this and

4283 other policy solutions could reduce the strain on assets and
4284 create real employment?

4285 *Mr. Powell. Thank you so much, Congressman. Thank you
4286 for your support of USE IT Act and so much other legislation
4287 that has tried to bring forward carbon capture and these
4288 other important technologies. Thank you for the update in
4289 title, as well. I didn't get quite that far, but I will take
4290 it here.

4291 You know, I think that policy that tries to take
4292 advantage again of the existing infrastructure, as we
4293 discussed with Congressman Armstrong, has a lot of real
4294 merit. I mean, it is an absolute shame that units like the
4295 Navajo Generating Station that have all of the interconnects,
4296 probably a lot of boilers and other potential things that
4297 could be put back to use, aren't being taken advantage of
4298 right now.

4299 I would say the highest and best use for facilities like
4300 that are as demonstration sites for carbon capture
4301 technology. So, you know, continuing the existing use of
4302 those sites, and continuing the existing use of the fossil
4303 fuel assets, we know we need to crack that technology if we
4304 are going to resolve global emissions. We know we need to
4305 demonstrate that somewhere. Why shouldn't we prioritize
4306 disadvantaged communities?

4307 And if it is not carbon capture technology, I do think

4308 that there is a lot of other things that could be done with
4309 those units and assets. For example, advanced nuclear
4310 technologies might be one thing that you could put into
4311 repower an existing fossil generating plant like that. Low-
4312 carbon hydrogen also might be something that you could bring
4313 in, whether that is produced from fossil fuels, or carbon
4314 capture, or produced from renewable resources, it might be
4315 something that you could bring in to revitalize those
4316 facilities and reuse those assets.

4317 So I think that prioritizing communities that are facing
4318 this transition and prioritizing using those existing assets
4319 is the way to do this that both has the least impact on
4320 communities, and potentially is the most cost-effective way
4321 to do it, because you are using the existing assets.

4322 *Mr. O'Halleran. Thank you, Mr. Powell.

4323 Mr. Gordon, a recent report stated that utility-scale
4324 energy storage installations will exceed 10 gigawatts by
4325 2021. I was proud to see my legislation signed into law last
4326 year, which the committee voted for also, which will provide
4327 technical assistance, identify barriers and financial
4328 resources from DoE to utilities serving rural communities.

4329 Could you discuss the importance of new energy storage
4330 technology being considered with transmission resource
4331 planning? Thank you.

4332 *Mr. Gordon. Thank you, Congressman. Yes. And in

4333 fact, in your own district we have over 1,000 megawatts of
4334 combined solar and energy storage projects in development.
4335 So we are working with utilities in the state to address, you
4336 know, the -- their resource adequacy needs after they replace
4337 or decide not to build new fossil generation. So we are
4338 already in your district working right now to build
4339 significant amounts of projects.

4340 *Mr. O'Halleran. Thank you very much. And I yield.
4341 Thank you, Mr. Chairman.

4342 *Mr. Rush. The gentleman yields back. And with that,
4343 this concludes the witness questions and answers phase of the
4344 subcommittee.

4345 And I certainly want to thank each of witnesses for your
4346 participation in today's hearing. You have made this hearing
4347 a very, very meaningful and successful hearing. I want to
4348 also thank all the members for your fine questions that you
4349 asked of the witnesses, and the witnesses for your answering
4350 these questions.

4351 So, again, I want to thank our witnesses for your
4352 participation, and the witnesses are excused.

4353 I want to remind members that, pursuant to committee
4354 rules, that they have 10 business days to submit additional
4355 questions for the record to be answered by the witnesses who
4356 have appeared. I ask each witness to respond promptly to any
4357 such question that you may receive.

4358 And now I have a unanimous consent request to enter into
4359 the record the following documents. And the staff has agreed
4360 that, due to the high volume of documents for the record, the
4361 minority and the majority staff have come to an agreement on
4362 the completeness and -- of this list. And I will ask now
4363 that we enter these records and these documents into the
4364 record, rather, en bloc.

4365 And without objection, so ordered.

4366 [The information follows:]

4367

4368 *****COMMITTEE INSERT*****

4369

4370 *Mr. Rush. At this time the subcommittee stands --

4371 *Mr. Burgess. Mr. Chairman? Mr. Chairman? Wait, this
4372 is Burgess. Would you yield for another unanimous consent
4373 request?

4374 *Mr. Rush. Oh, yes. I yield to Mr. Burgess.

4375 *Mr. Burgess. I just wanted to ask unanimous consent
4376 that an article from E&E News discussing the Petra Nova plant
4377 that I talked about in Houston from September of 2020 -- I
4378 will have my staff get that to you, and I would ask unanimous
4379 consent to include that in the documents in the record, as
4380 well.

4381 *Mr. Rush. Hearing no objection, so ordered.

4382 [The information follows:]

4383

4384 *****COMMITTEE INSERT*****

4385

4386 *Mr. Rush. We will now -- and without objection now,
4387 the subcommittee is adjourned.

4388 [Whereupon, at 3:38 p.m., the subcommittee was
4389 adjourned.]