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4 H.R. 906, A BILL TO MODIFY THE EFFICIENCY STANDARDS FOR GRID-

5 ENABLED WATER HEATERS

6 THURSDAY, MARCH 19, 2015

7 House of Representatives,

8 Subcommittee on Energy and Power

9 Committee on Energy and Commerce

10 Washington, D.C.

11 The Subcommittee met, pursuant to call, at 10:03 a.m.,
12 in Room 2322 of the Rayburn House Office Building, Hon. Ed
13 Whitfield [Chairman of the Subcommittee] presiding.

14 Members present: Representatives Whitfield, Shimkus,
15 Latta, McKinley, Griffith, Flores, Mullin, Hudson, Rush,
16 Tonko, Green, Welch, Loeb sack, and Pallone (ex officio).

17 Staff present: Nick Abraham, Legislative Clerk;
18 Charlotte Baker, Deputy Communications Director; Leighton

19 Brown, Press Assistant; Allison Busbee, Policy Coordinator,
20 Energy and Power; Patrick Currier, Counsel, Energy and Power;
21 Chris Sarley, Policy Coordinator, Environment and the
22 Economy; Michael Goo, Democratic Senior Counsel, Energy and
23 Environment; Caitlin Haberman, Democratic Professional Staff
24 Member; and John Marshall, Democratic Policy Coordinator.

|
25 Mr. {Whitfield.} I would like to call the hearing to
26 order this morning. I know we are going to have some votes.
27 This is a very important hearing, and we certainly want to
28 give everyone an opportunity to give their opening statement
29 and ask questions.

30 Today's hearing is about H.R. 906, a bill to modify the
31 efficiency standards for grid-enabled water heaters. Many of
32 you may remember a singing group called Dire Straits, and
33 they had this marvelous song, Money for Nothing and the
34 chicks are free. And in the lyrics of that song they talk
35 about moving and selling microwave ovens, refrigerators, and
36 color TVs. And we know in today's world, you can't sell a
37 microwave oven or a color TV or a refrigerator or anything
38 else without a government dictating what is in the product.

39 So we find ourselves in a world where the government is
40 really micromanaging through regulations really everything in
41 our society, whether we are talking about healthcare, the
42 requirements for a community bank to make to a farmer in
43 Kentucky, to make a loan. And now today, last March I guess
44 it was, the Department of Energy came out with a regulation
45 about hot water heaters.

46 So we are here today to discuss a bill that will bring
47 regulatory relief to many electricity providers,

48 manufacturers, and consumers across the country. There are
49 approximately 250 electric cooperatives in 34 states that
50 utilize these large electric resistance water heaters in
51 demand response programs to help with reliability and
52 consumer costs during peak periods of energy use.

53 As I said, the Department issued this new efficiency
54 standard in March of 2010, and they are prohibiting the
55 manufacture of water heaters that are 55 gallons or larger if
56 they are electric resistance heaters, and they are mandating
57 that they go to heat pump technology.

58 You know, all of us here in Congress, we have groups
59 come in all the time talking about the government's control
60 in what kind of fan motor you can have, what kind of light
61 bulb you can have, whatever. This is one of those issues
62 that I think just about every Member of Congress agrees that
63 when you are interfering with demand response programs, it is
64 counterproductive.

65 So hopefully we can introduce this bill, and if people
66 want to try to amend it or whatever, do regular order and try
67 to bring some relief to the American consumer. I get really
68 excited when I think about hot water heaters, and I would
69 like to say more, but right now I am going to yield 1 minute
70 to Mr. Latta of Ohio.

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

72 ***** COMMITTEE INSERT *****

|

73 Mr. {Latta.} I appreciate the chairman for yielding,
74 and you are absolutely right. We all love those hot water
75 heaters when you get in there in the shower in the morning.
76 But Mr. Chairman, thanks again for having this very important
77 hearing today to discuss this very important legislation to
78 modify the efficiency standards for grid-enabled hot water
79 heaters. I am pleased to be a cosponsor of the legislation.
80 I hope the committee can advance the legislation quickly as
81 you said, that there is great bipartisan support.

82 The rural electric cooperatives are very important in my
83 district. They provide power to agriculture and
84 manufacturing operations that are important to the local,
85 state, and national and global economy. In fact, I have
86 seven rural electric co-ops in my district, and all seven use
87 voluntary demand response programs to reduce peak demand,
88 increase the use of renewable energy, and decrease costs to
89 the consumer. This legislation permits the continued
90 manufacturing of electric resistant hot water heaters above
91 75 gallons for use in thermal energy storage and demand
92 response programs. Enabling the manufacturing of these water
93 heaters is vital for the demand response programs. I look
94 forward to today's testimony, Mr. Chairman, and I yield back.
95 I appreciate it. Thank you.

96 [The prepared statement of Mr. Latta follows:]

97 ***** COMMITTEE INSERT *****

|
98 Mr. {Whitfield.} The gentleman yields back. At this
99 time I would like to recognize the gentleman from Illinois,
100 Mr. Rush, for his opening statement.

101 Mr. {Rush.} Thank you, Mr. Chairman. I want to thank
102 you for holding this hearing. Mr. Chairman, my first request
103 is for unanimous consent. We would like to hear you sing
104 that song that you mentioned.

105 Mr. {Whitfield.} I object.

106 Mr. {Rush.} Mr. Chairman, I really want to--as you
107 know, I have been unavoidably absent, and I want to thank my
108 friend from California, Mr. McNerney. He is not here right
109 now--for sitting in the chair for me during my absence, and I
110 want to also thank you, Mr. Chairman, for holding today's
111 hearing on this very important bill, H.R. 906. This is a
112 straightforward bill that seeks to modify the Department of
113 Energy's efficiency standards regarding low-capacity electric
114 resistant water heaters in order to allow the continual
115 manufacture and use of electric resistant water heaters above
116 75 gallons for use in thermal energy storage and demand
117 response programs because as I understand it, Mr. Chairman,
118 in 2010, energy efficiency standards issued by the Department
119 under the Energy Policy and Conservation Act require nearly
120 200 percent efficiency for large-capacity electric resistant

121 water heaters for those manufactured after April 16, 2015.

122 Supporters of H.R. 906, such as National Rural Electric
123 Cooperative Association, argue that the rule as drafted would
124 effectively prohibit the continual manufacture of large-
125 capacity electric resistant water heaters which would then
126 have to be replaced by heat pumps that are not compatible
127 with certain utility thermal energy storage and demand
128 response programs.

129 So Mr. Chairman, as you can see, this is a very
130 important hearing, and I look forward to hearing the
131 testimony from the expert witnesses today. And with that, I
132 yield back the balance of my time.

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

134 ***** COMMITTEE INSERT *****

|
135 Mr. {Whitfield.} The gentleman yields back.

136 Mr. {Rush.} There is somebody that--

137 Mr. {Whitfield.} I tell you what. If you all wouldn't
138 mind, I will recognize you all for 5 minutes, and you can
139 split it up the way you want to. Is that okay? Okay. All
140 right.

141 Is there anyone on our side that would like to make any
142 comments about this bill? Okay. Then Mr. Welch, I will
143 recognize you for 5 minutes.

144 Mr. {Welch.} Well, I can't match your lyrics, but I can
145 agree with everything you have said and my colleague, Mr.
146 Latta. You know, the Department of Energy does really good
147 stuff, and I actually think standards are a very important
148 tool. But we also have to have it match what realistically
149 can be done in order to get the benefit of demand response.
150 And there are a lot of homes that have these water heaters
151 that are going to benefit, and this is going to save folks
152 money. So the regulation I think has to have as a goal the
153 maximum deployment and the maximum energy efficiency. And I
154 think that is what is uniting us in this effort here.

155 I am like Congressman Latta. The local cooperatives are
156 fantastic and really a lifeline for a lot of our citizens in
157 rural areas. And homeowners are doing everything they can to

158 try to save money on their bills. They need an opportunity.
159 They know that less is more if they can save some money. And
160 then when they have their cooperative working with them in
161 this demand response that actually integrates this
162 opportunity of savings with the technology that people
163 actually have in their homes, let us take advantage of it.

164 So this is great bipartisan legislation, and I am
165 hopeful that we can get this done. And I appreciate, Mr.
166 Chairman and Mr. Ranking Member, your cooperation on this in
167 leading the committee. Thank you. I yield back.

168 [The prepared statement of Mr. Welch follows:]

169 ***** COMMITTEE INSERT *****

|
170 Mr. {Whitfield.} Did you want to yield to Mr. Loeb sack
171 or--

172 Mr. {Welch.} I yield to Mr. Loeb sack. Thank you.

173 Mr. {Loeb sack.} Thank you, Mr. Welch. Thank you, Mr.
174 Chair. My wife often refers to me as what Second City used
175 to call mainstream-challenged. I don't know if you know what
176 I am talking about or not. That probably means that I really
177 am mainstream-challenged if I am the only one who knows what
178 I am talking about. But talking about water heaters I think
179 puts me in the mainstream, and talking about Dire Straits
180 really does--I would love to hear you sing, Mr. Chairman, but
181 I would like to have Sting accompany you as he does on that
182 song that you mentioned.

183 But it is great to be here. It is really wonderful
184 because this is a bipartisan effort, something that the
185 American public and everyone in this room knows happens all
186 too infrequently here in the U.S. Capitol here in Washington,
187 D.C. A problem was recognized, and a problem is going to get
188 rectified with this legislation. And also on a bipartisan
189 basis, we are here to really recognize the importance of
190 these rural electric cooperatives as well. You know, they
191 date back a long ways to the 1930s in Iowa certainly and
192 about 15 percent of our population are served by these RECs

193 now. And I visit as many of them as I possibly can. I have
194 had meetings. They have let me hold meetings there, not just
195 to go see what they have to do but so I can talk to other
196 folks as well. But they get it. They understand how to
197 service the population in these rural areas. And so their
198 concerns I think need to be our concerns, and that is in
199 large part why we have this legislation today.

200 So I thank you, Mr. Chair, and thank all those folks on
201 a bipartisan basis who joined together on this, and I do look
202 forward to your testimony. Thank you. And I yield back to
203 Mr. Welch.

204 [The prepared statement of Mr. Loeb sack follows:]

205 ***** COMMITTEE INSERT *****

|
206 Mr. {Whitfield.} Okay. They yield back. That
207 concludes the opening statements. Now I have just been
208 notified that we have two votes on the House Floor right now,
209 and they have already started, 10 minutes left in the first
210 vote. So we are going to recess, and then when we come back,
211 we really look forward to the testimony of you four gentlemen
212 because you all are very much aware of the ramifications of
213 this legislation, the impact of the regulation as well. So
214 we look forward to that. Did you want to say anything?
215 Okay. So we will recess, and hopefully we will be back
216 within about 15 or 20 minutes. So thank you all for your
217 patience. I am sorry for the interruption, but we will be
218 back as soon as we can.

219 [Recess.]

220 Mr. {Whitfield.} I would like to call the hearing back
221 to order, and we do expect some of the other members to be
222 here shortly. As I said, we have a great panel of witnesses.
223 I want to thank all of you for coming, and I am just going to
224 introduce you individually as you prepare to give your
225 statement. So our first witness this morning is Gary Connett
226 who is the Director for Member Services and Demand-Side
227 Management at the Great River Energy entity. So Mr. Connett,
228 you are recognized for 5 minutes. And I would just ask all

229 of you to pull the microphone up close enough so that we can
230 hear you clearly. And thank you for being with us, Mr.
231 Connett.

|
232 ^STATEMENTS OF GARY CONNETT, DIRECTOR, MEMBER SERVICES AND
233 DEMAND-SIDE MANAGEMENT, GREAT RIVER ENERGY; STEVEN KOEP,
234 UTILITY SALES MANAGER, VAUGHN THERMAL CORPORATION AND
235 ELECTRIC WATER HEATERS; STEVEN NADEL, EXECUTIVE DIRECTOR,
236 AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY; AND ROBIN
237 ROY, DIRECTOR, BUILDING ENERGY EFFICIENCY AND CLEAN ENERGY
238 STRATEGY AND NATURAL RESOURCES DEFENSE COUNCIL

|
239 ^STATEMENT OF GARY CONNETT

240 } Mr. {Connett.} Thank you. Chairman Whitfield and
241 members of the Subcommittee, thank you for inviting me to
242 testify today on legislation to protect grid-enabled water
243 heaters.

244 You mentioned my name. My name is Gary Connett,
245 Director of Demand-Side Management at Great River Energy, a
246 generation and transmission cooperative that serves 28 member
247 retail distribution cooperatives located in Minnesota and
248 Northwestern Wisconsin. And I, by the way, am one of these
249 people that actually has one of these water heaters that we
250 are talking about today. I want to thank the subcommittee
251 for addressing this important and timely issue. Large-
252 capacity electric resistance water heaters are essential

253 demand response tools for electric cooperatives. Immediate
254 action is needed to mitigate the impacts of a 2010 Department
255 of Energy efficiency rule and help maintain our ability to
256 use those water heaters in voluntary demand response
257 programs.

258 The DOE rule which goes into effect on April 16, as you
259 mentioned, effectively bans the manufacture of electric
260 resistance water heaters with this storage capacity of over
261 55 gallons. As manufacturers prepare to shut down production
262 lines, this widely supported legislation is urgently needed.

263 The electric industry is searching for a low-cost
264 battery to store electricity. At Great River Energy, we
265 think we have it. It is in the basements of nearly 100,000
266 homes in Minnesota. It charges each night and discharges
267 every day in the form of hot water. It does this night after
268 night, year after year, storing and discharging over 1,000
269 megawatt hours every day. I would argue that it might be the
270 largest battery in the upper Midwest. This battery consists
271 precisely of the same water heaters that the DOE wants to
272 ban.

273 Through demand response programs offered by electric
274 cooperatives, these super-insulated, high-efficiency water
275 heaters store low-cost off-peak energy which is available in
276 the nighttime hours. We store it in the form of hot water.

277 They allow for the better utilization of renewable energy and
278 more efficient operation of the electric grid. More
279 importantly, water heaters play an important role in
280 cooperatives' efforts to provide its member-owners with safe,
281 reliable, and affordable electric energy.

282 Even when not tied to renewable energy, cooperatives
283 across the country use these water heaters to reduce demand
284 for electricity during peak hours which would otherwise be
285 served by additional and less efficient electric generators.
286 Today over 250 electric cooperatives across the country are
287 engaged in voluntary demand response programs using large-
288 capacity electric-resistance water heaters.

289 They are one of the best tools cooperatives have for
290 integrating renewable energy and encouraging demand response
291 and improving system reliability.

292 So on April 16 a new efficiency standard will take
293 effect. This standard will require all large-capacity
294 electric water heaters to operate at about 200 percent
295 efficiency, a level that only heat-pump water heaters can
296 achieve. While heat pump water heaters are energy efficient,
297 they don't work so well with utility demand response programs
298 and they don't work so well in cold climates, such as
299 Minnesota.

300 The DOE, despite its good intentions, was unaware of the

301 impact that its rule would have on utilities' demand response
302 programs. However, due to regulatory hurdles, the DOE has
303 not been able to resolve the issue.

304 In a great cooperative fashion, the National Rural
305 Electric Cooperative Association worked with a large
306 stakeholder group to come up with a legislative solution that
307 will not only help protect these water heaters but will also
308 advance water heater technology by establishing criteria for
309 grid-enabled water heaters. The widespread stakeholder
310 support for this solution should make it an easy decision to
311 pass this urgent legislation immediately.

312 H.R. 906 doesn't repeal the DOE standard but rather
313 permits the continued manufacture of large capacity water
314 heaters above 75 gallons for use in demand response programs.
315 The legislation includes language to prevent these water
316 heaters from entering the market unless they are used in
317 utility demand response programs.

318 As the subcommittee is aware, the consensus legislation
319 has been incorporated into numerous pieces of energy
320 efficiency legislation in both the House and the Senate over
321 the past 2 years. Last March the House passed H.R. 2126, the
322 Energy Efficiency Improvement Act, by an overwhelming vote of
323 375 to 36. Three of the four titles of H.R. 2126 were
324 recently attached to S. 1, a bill to approve the Keystone

325 pipeline, a bill that passed both the House and Senate in
326 this Congress but was vetoed for reasons unrelated to the
327 water heater title.

328 In summary, H.R. 906 is a good bill. It fixes things to
329 everyone's liking. On behalf of Great River Energy and the
330 other cooperatives across the Nation who face the threat to
331 this new DOE standard, I want to thank Chairman Whitfield and
332 Representative Welch as well as Representatives Latta,
333 Loeb sack, Cramer, and Doyle for their leadership on the
334 current legislation and persistence in seeing it through.
335 Thank you.

336 [The prepared statement of Mr. Connett follows:]

337 ***** INSERT A *****

|

338 Mr. {Whitfield.} Mr. Connett, thank you very much for
339 your statement. At this time, I would like to recognize
340 Steven Koep who is the Utility Sales Manager at the Vaughn
341 Thermal Corporation and the Vaughn Electric Water Heaters.
342 Thank you very much for being with us this morning, and we
343 look forward to your 5 minutes of testimony.

|
344 ^STATEMENT OF STEVEN KOEP

345 } Mr. {Koep.} Good morning and thank you.

346 Mr. {Whitfield.} And if you wouldn't mind turning it on
347 and get it up closer so that we can hear you?

348 Mr. {Koep.} Okay. Am I coming through?

349 Mr. {Whitfield.} Yes, sir.

350 Mr. {Koep.} Thank you.

351 Mr. {Whitfield.} Thanks.

352 Mr. {Koep.} Good morning and thank you. Chairman
353 Whitfield, Ranking Member Rush, members of the subcommittee,
354 thank you for inviting me to today. My name is Steve Koep.
355 I am the National Utility Sales Manager at Vaughn Thermal
356 Corporation. We manufacture electric water heaters in
357 Salisbury, Massachusetts. We also manufacture a wide range
358 of water heating and electronic control technologies. I
359 would like to thank the subcommittee for addressing this
360 important issue and for inviting me here today.

361 Vaughn has been in the business of manufacturing high-
362 efficiency, long-life electric water heaters for electric
363 utility programs for over 50 years. We are an active member
364 of AHRI, and as such, I am here to represent Vaughn but also
365 the other water heater manufacturers whose support of the

366 legislative effort. That would be A.O. Smith and Rheem and
367 General Electric who are all part of that stakeholder group.

368 Following the general outline of my written testimony, I
369 would like to touch on some pertinent questions and topics.

370 First is why the urgency? It has been almost 5 years
371 since the final rule was announced, and it has been 2 years
372 since DOE held a meeting on the proposed rule-making to
373 establish a waiver process to address the concerns of the
374 electric utility industry. As we have heard the DOE rule
375 will most certainly cause the erosion of existing demand
376 response resources, resources that by DOE's own admission the
377 country needs and the country wants.

378 Secondly, why are we also concerned about this fraction
379 of a fraction of the electric water heating market? While
380 large-capacity residential electric resistance water heaters
381 make up less than 5 percent of the electric water heating
382 market, they are more than 90 percent of what gets installed
383 in utility demand response programs. That is why they are so
384 important.

385 As you know, the legislation contains the provision for
386 a grid-enabled product classification. I feel it is
387 important to point out that utilities, manufacturers, and
388 public policy organizations, all of those represented here
389 today, all support this legislation. This is as close as we

390 can get to unanimous support on any utility industry issue.

391 In addition, there is an activation key provision within
392 the legislation that will equate to a very low likelihood of
393 leakage for these products through traditional wholesale and
394 retail channels. In previous presentations on this issue, I
395 have used the phrase change the technology or change the
396 source energy. It is fair to characterize the DOE approach
397 as change the technology since efficiency gains will lead to
398 reduced carbon emissions. But it is also true that changing
399 the source energy and maximizing of the renewable input to
400 these appliances reduces carbon as much or more. We need to
401 pursue both strategies simultaneously. It needs to be and
402 not or. We need to change the technology and change the
403 source energy, and by doing so we have the unique opportunity
404 to double the carbon reduction potential in the electric
405 water heating market. That is exciting.

406 I think it is fair to look at this as a renewable
407 storage opportunity. Again, a phrase that I have used: What
408 happens when the forgotten appliance meets the internet of
409 things? You get the grid-enabled water heater. High-speed
410 two-way communication to this appliance and aggregation on
411 the scale of the Great River Energy Program, which means we
412 have the potential for the largest aggregated interactive
413 thermal battery probably on the face of the earth.

414 I am sure you are all familiar with the issues of
415 curtailed wind and spilled hydro. In this country we have
416 excess low-cost and no-cost renewable energy that goes for
417 the asking at certain times of the year and certain times of
418 the day. So please remember that electric thermal storage is
419 the low-hanging fruit when it comes to renewable storage and
420 electric storage technologies. ETS storage is 1/10 the cost
421 of batteries of fly wheels.

422 In summary I just want to touch briefly on the market
423 potential and the potential market impact of grid-enabled
424 water heaters. Within this country there are over 50 million
425 installed electric water heaters in households across the
426 country. Roughly 4 million of those are replaced annually.
427 That money is being spent, that investment is being made on
428 an annual basis. If we could divert or convert 10 percent of
429 the annual turnover to grid-enabled water heaters, that would
430 be 400,000 water heaters a year. That would be like
431 implementing four Great River Energy Programs on an annual
432 basis. But you know, the potential here is very large. And
433 as I said, the investment is being made. We could do this
434 for just the incremental cost of the controls. The tanks are
435 being manufactured and sold and installed every year to
436 replace the water heaters that are failing.

437 Historically, my personal experience is telling me that

438 timing is everything. So if doing the wrong thing at the
439 right time or any other time isn't going to get us where we
440 want to go, even the right thing at the wrong time doesn't
441 help. We need to do the right thing at the right time, and
442 this legislation is the right thing at the right time. So I
443 want to thank you for the opportunity to visit with you
444 today, and I welcome any questions you may have.

445 [The prepared statement of Mr. Koep follows:]

446 ***** INSERT B *****

|
447 Mr. {Whitfield.} Thanks very much, Mr. Koep. At this
448 time I would like to introduce Mr. Steve Nadel who is the
449 Executive Director of the American Council for an Energy-
450 Efficient Economy. Thanks for being with us, and you are
451 recognized for 5 minutes.

|
452 ^STATEMENT OF STEVEN NADEL

453 } Mr. {Nadel.} Okay. Thank you, Mr. Chairman, Mr.
454 Ranking Member, the members of the committee. As you noted,
455 I am with the American Council for an Energy-Efficient
456 Economy. We are a non-profit research organization that
457 works on technologies, programs, and policies to advance
458 energy efficiency. We have been doing this for 35 years now,
459 and over this period, substantial progress has been made on
460 energy efficiency, due in part to strong bipartisan support
461 from Congress. As you, Mr. Chairman, stated at a previous
462 hearing I testified at, no one is in favor of energy waste.

463 I am here today like the other witnesses to testify in
464 support of H.R. 906. Water heating is a major use of home
465 energy use, second only to space heating. For homes with
466 electric water heating, the water heater is generally the
467 single-largest electricity user. Due to the high cost of
468 water heaters, they were included in part of federal energy
469 efficiency standards passed by Congress in 1987 and signed by
470 President Regan. Congress set the initial standards, and DOE
471 periodically revises these standards based on criteria that
472 Congress established.

473 A 2012 analysis estimates that the standards already

474 enacted on water heaters as well as other products are saving
475 consumers and businesses in the United States a cumulative
476 trillion dollars. So these are enormous savings, not
477 million, not billion, trillion.

478 In 2010, as we have already heard, after a multi-step
479 rule-making process, DOE established new efficiency standards
480 for water heaters that take effect next month. The standards
481 apply at the point of manufacture and do not affect water
482 heaters already in houses or in the sales distribution
483 system. The new standards require moderate efficiency
484 improvements in water heaters with a storage capacity of 55
485 gallons or less but much larger efficiency improvements in
486 both electric and gas water heaters over 55 gallons. I would
487 note that 50 gallons is the average electric water heater.
488 So these only apply above those stronger standards, above
489 that.

490 Households with very large water heaters use more hot
491 water on average, making higher efficiency levels cost
492 effective. When DOE established the standards, it estimated
493 that the average household with a very large electric water
494 heater would save over \$600 over the life cycle of their high
495 efficiency unit.

496 Now, as we have heard, many electric cooperatives as
497 well as some other utilities have long sponsored programs to

498 use water heaters to heat and store hot water during off-peak
499 periods such as overnight permitting lower energy use during
500 peak periods. These programs help utilities manage their
501 systems by reducing peak loads. A timer or radio control or
502 other type of communication device controls the water heaters
503 to generally stop them from operating during peak periods.

504 After DOE issued the rule in 2010, some utilities
505 realized that the very large electric-resistance water
506 heaters they sometimes use in demand response and thermal
507 storage programs would no longer be manufactured. There are
508 heat pump water heaters, but these have not yet been fully
509 evaluated and field tested for use in demand response and
510 thermal storage programs.

511 To address these concerns, as we have all heard, many
512 organizations negotiated the language in H.R. 906, and we
513 very much appreciate the Chairman and the other cosponsors.
514 It carefully balances opportunities for saving energy via
515 high-efficiency water heaters with the benefits to utilities
516 of using large electric water heaters and demand response and
517 thermal storage programs. It allows for the continued
518 manufacture of these large electric resistance water heaters
519 with a variety of provisions to limit their use to homes
520 participating in demand response and thermal storage
521 programs. The bill also provides guidance so that DOE will

522 carefully consider both energy efficiency and demand response
523 opportunities in future rule-makings.

524 So as I said, we do support this bill. We also
525 recommend that his committee consider other energy efficiency
526 bills. We hope that this is just the beginning of what we
527 think could be a very productive Congress in terms of energy
528 efficiency. So with that, I look forward to your questions,
529 and thank you for the opportunity to testify.

530 [The prepared statement of Mr. Nadel follows:]

531 ***** INSERT C *****

|
532 Mr. {Whitfield.} Thank you very much, Mr. Nadel, for
533 that statement. At this time I would like to recognize Mr.
534 Robin Roy who is the Director for Building Energy Efficiency
535 and Clean Energy Strategy at the Natural Resources Defense
536 Council. Thank you very much for being with us, and you are
537 recognized for 5 minutes.

|
538 ^STATEMENT OF ROBIN ROY

539 } Mr. {Roy.} Thank you, Mr. Chairman, and members of the
540 subcommittee. Thank you for the opportunity to share the
541 views of the Natural Resources Defense Council on grid-
542 enabled water heaters which we believe present a promising
543 opportunity for a more efficient, more economic, and
544 ultimately lower emissions electricity system overall. We
545 really appreciate your leadership on this issue and your
546 sponsorship of this bill.

547 In brief, NRDC supports H.R. 906 to allowed continued
548 production, use, and evaluation of grid-enabled water
549 heaters. One of NRDC's top institutional priorities is
550 creating and facilitating a clean energy future, and to that
551 end we have long supported and advocated for greater energy
552 efficiency, greater productivity and using federal energy
553 appliance standards as one tool in the portfolio for getting
554 there.

555 Given our longstanding support for stronger energy
556 efficiency, it may seem surprising that we support this
557 legislation which allows for continued production of electric
558 resistance water heaters that may use double or more the
559 energy of a heat pump water heater that would otherwise be

560 required. But there is a good reason. We explored the
561 opportunities. We talked to our colleagues here and many
562 others in manufacturing and among utilities, and we found the
563 case persuasive. We worked with these colleagues from
564 manufacturing, utilities, other efficiency and environmental
565 organizations, and we came up with an approach that delivers
566 on the opportunity for efficiency savings and delivers on the
567 opportunity for grid-interactive water heating, demand
568 response and--services. It doesn't undermine the
569 opportunities from the efficiency standards. This language
570 is a product of that work.

571 I have to say as a bit of an aside, sometimes when a lot
572 of folks get together, it is hard work to come up with
573 something that we can all agree on. We come with different
574 perspectives. And sometimes that goes into an abyss. We
575 never hear anything from it again. And it is so pleasing to
576 see something like H.R. 906. I really do appreciate the
577 effort. We see the result of our hard work, and it kind of
578 encourages us at NRDC to do more of that, reaching out to
579 other parties, and I really do appreciate that. I know I
580 burned some time on that, but it is really important.

581 The key opportunity here is, as my colleagues have
582 already expressed, is the achievement of benefits at a system
583 level. Federal energy appliance standards focus on the

584 component level. We recognize the difference. We are
585 looking towards having while maybe more energy use, having
586 that energy use at more attractive times, lower cost, lower
587 emissions, overall just a much better outcome. We are very
588 keen on that. We recognize that that is the opportunity that
589 is presented by this water heater energy storage, this large
590 battery as my colleagues have said. We are very keen on it.

591 One of the key elements of H.R. 906 that we are so
592 delighted by is that it allows for, really encourages, much
593 more analysis of consumer and environmental impacts from
594 grid-enabled water heaters. It is built right in. There is
595 so much to be learned about the effectiveness of these water
596 heaters. Actually, there is so much to be learned about not
597 just grid-enabled water heaters but about heat pump water
598 heaters and what might be done to optimize our energy use
599 delivering the greatest consumer and environmental outcomes.

600 We are at a really early stage analytically. It is
601 inherently complex. There are a lot of other water heater
602 technologies existing and emerging. Conditions in Mr.
603 Connett's area are different from conditions in the Pacific
604 Northwest, and those are different from those in the South.
605 Getting analysis right is not always that easy, but it is
606 really worth doing for water heaters. They are 15 percent or
607 more of residential energy use. They are big. If we get

608 this one right, even small improvements can deliver great
609 consumer and environmental outcomes.

610 One issue that is often on some people's minds is
611 whether this grid-enabled water heater legislation will pose
612 a problem for heat pump water heaters. We don't think that
613 is the case. We think that grid-enabled water heaters, this
614 legislation, focuses on a fairly small market segment where
615 heat pump water heaters may not be most well-suited and in
616 fact, the attention to water heating, the further analysis
617 that will come from this, may actually end up delivering much
618 more advance in all sorts of water heater technologies, both
619 in development of technologies and understanding them and
620 deploying them through good utility programs and consumer
621 choices.

622 I think that is really pretty much all I want to say. I
623 can talk a little bit more about our long and abiding love
624 for federal energy standards as one of the tools in the
625 portfolio that give us a more efficient, economic future, but
626 I think that is already on the record pretty well. I
627 appreciate the opportunity.

628 [The prepared statement of Mr. Roy follows:]

629 ***** INSERT D *****

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630 Mr. {Whitfield.} Mr. Roy, thanks very much, and thanks
631 for being here. At this time we will ask questions, and I
632 would like to recognize myself for 5 minutes.

633 First of all, I was not aware that hot water heaters
634 were the largest users of electricity in most homes, and I
635 think someone did say that. But Mr. Koep, I think you are
636 involved in the manufacture of water heaters, and let us say
637 we are not successful in adopting 906. Would a heat pump
638 water heater that would be manufactured under the new
639 regulation, would that be more expensive than the heat
640 resistant water heater that is currently being used?

641 Mr. {Koep.} Chairman, thank you for the question. Yes,
642 it would. Large-capacity heat pump water heaters in general
643 will be about twice the cost of a large-capacity electric
644 resistance water heater. You add the compressor cost and the
645 installation cost, and it is more expensive by about a factor
646 of two. So it does have a cost impact. The question has
647 also been asked whether heat pump water heaters can be grid-
648 enabled and grid interactive. The technology is taking us in
649 that direction, but you know, in the short term, we are just
650 not there yet. There is important work to do in that area,
651 but right now the grid-enabled large-capacity units are the
652 tools that we need.

653 Mr. {Whitfield.} So what would be, if you double the
654 cost, what kind of costs are we talking about for a large hot
655 water heater?

656 Mr. {Koep.} Well, an 80-gallon heat pump water heater
657 is going to be in the \$1,500 range--

658 Mr. {Whitfield.} \$1,500?

659 Mr. {Koep.} --at retail.

660 Mr. {Whitfield.} Yeah.

661 Mr. {Koep.} I think that an 80-gallon is the small end
662 of the range. Generally with large-capacity units for
663 thermal storage, you will see 100-gallon and we are gearing
664 up to build 120-gallon water heaters. So we are moving in
665 that direction.

666 Mr. {Whitfield.} Well, without getting too technical
667 and just for laymen's understanding, why is it that a heat-
668 resistant water heater is more compatible with demand
669 response than--heat pump would be less compatible than the
670 heat resistant?

671 Mr. {Koep.} Well, it has to do with the ability to
672 control the wattage of the element. You know, the finer
673 element control enables a lot of the ancillary services in
674 terms of frequency control and other things that the
675 independent system operators are willing to compensate for.
676 So to the extent that we can control those elements, we can

677 provide these services.

678 The heat pump water heater with the compressor, we can
679 vary element wattage to the compressor. Turning a compressor
680 on and off in short periods of time shortens compressor life.
681 It is just not a real compatible technology for the fine
682 level of control that we can achieve with elements.

683 Mr. {Whitfield.} Right. And Mr. Connett, what do you
684 think would be the overall impact for electric co-ops around
685 the country if we are not successful in passing this
686 legislation?

687 Mr. {Connett.} Mr. Chair, a lot of the electric
688 cooperatives have a fair amount of electric water heaters in
689 their territory today. We might call those uncontrolled
690 water heaters. A lot of the co-ops' service territory
691 doesn't have natural gas. It has propane as an option, and
692 in many of those areas, the choice for heating water would be
693 an electric water heater. It is less expensive to operate
694 than a propane one.

695 Mr. {Whitfield.} Okay.

696 Mr. {Connett.} And so if those were all to go in
697 without any control capability, we are going to add to our
698 peak demands, and if we start to add to our peak demands,
699 that means additional cost to our consumers. It means
700 additional emissions, additional fuel costs, additional power

701 plants potentially. And so having this ability to have a
702 water heater that is a large volume water heater that allows
703 us to take that entire electric load and shift it to an off-
704 peak period is good for our memberships and good for our co-
705 ops.

706 Mr. {Whitfield.} Okay. Well, I want to thank all of
707 the groups that work together. You know, we have a lot of
708 issues up here in which there are strong philosophical
709 differences, and the only way we are going to move forward is
710 for groups to recognize, including those on my side, we can't
711 always get everything we want. And that is why the regular
712 order is so important. So thank you all for working together
713 on this, and hopefully we can pass this legislation.

714 And at this time I would like to yield 5 minutes to the
715 gentleman from Illinois.

716 Mr. {Rush.} Thank you, Mr. Chairman. Mr. Nadel, in the
717 initial legislative effort to address this grid-enabled water
718 heater issue, you actually testified before the Senate Energy
719 and Resources Committee in June of last year, June of 2013
720 rather, expressing your organization's concern over the
721 legislative language proposed at the time. Would you assert
722 ``allow widespread use of less efficient water heaters and
723 application without off-peak water heating or load
724 management''? Since that time your organization has been--at

725 the negotiating table and actually helped draft the new
726 language contained in this bill. Can you speak to your
727 organization's involvement and investment in this new
728 language and have your fears been addressed in the current
729 bill that we have before us today?

730 Mr. {Nadel.} Yes, I thank you for bringing that up.
731 Yes, our concerns have been addressed. In fact, after that
732 hearing some of the people here in this room came up to me
733 and said can we talk? Can we try to work something out? The
734 bill originally basically just allowed unlimited sales of
735 these water heaters for these applications. We have, as you
736 have heard in the testimony here, the bill has a number of
737 provisions to effectively limit its use to those households
738 where there is a demand response or thermal storage program.
739 With those limitations and those protections, and I describe
740 them in more detail in my written testimony, we are very
741 comfortable with this bill. It allows demand response
742 programs but doesn't allow widespread leakage.

743 Mr. {Rush.} Thank you. Mr. Roy, are you convinced that
744 this bill will have a positive impact on both consumers and
745 the environment by allowing the use of grid-enabled water
746 heaters?

747 Mr. {Roy.} Yes, I am, sir. I believe the light that
748 will be shown on this opportunity for grid-enabled water

749 heaters, the analysis that will come with it will focus a lot
750 of attention. So we will get benefits not just directly from
751 the application of grid-enabled water heaters as they are
752 called for here, but I think we will have more utilities,
753 more demand response service providers and aggregators for
754 utilities. I see that we have a representative from a
755 Pennsylvania, a PJM, transmission organization in the room
756 here today. We will have much more attention on the broader
757 set of opportunities that are available in water heating.

758 I think the direct and spillover effects both can be
759 great from this. I know my organization will be working hard
760 with all these parties to see what can we do now that we have
761 something that is powerful and productive in this space? How
762 can we really work forward and help each other with the
763 programs, help deliver better consumer and environmental
764 outcomes?

765 Mr. {Rush.} Thank you. Let me ask across the table.
766 Is there anyone who has any concerns with this bill in
767 thinking that it may have unintended consequences that we
768 have not covered today? Does anyone of you all think that
769 there is anything that we haven't focused on, that we haven't
770 covered, that may have an unintended consequence that we
771 should be aware of?

772 Mr. {Roy.} I think we always find some unintended

773 consequences in most things we do, either as actions or
774 through inaction. What is important is that we are aware of
775 it, are responsive, and we work forward.

776 What we have here is an industry segment and a degree of
777 attention that I think will help us all address any
778 unintended consequences in a timely fashion and deal with
779 those and move onto the great opportunities that are
780 available.

781 Mr. {Rush.} Mr. Chairman, with that I yield back the
782 balance of my time.

783 Mr. {Whitfield.} The gentleman yields back. At this
784 time I recognize the gentleman from West Virginia, Mr.
785 McKinley, for 5 minutes.

786 Mr. {McKinley.} Thank you, Mr. Chairman, and thank you
787 for having this hearing. I am curious back on the comment
788 that I think it was you, Mr. Koep, said about the heat pump
789 water heater at around the cost of \$1,500. Also labor would
790 be a little higher, too, wouldn't it, installing that?

791 Mr. {Koep.} Yes. Installation costs with heat pump
792 water heaters are generally higher than electric resistance.

793 Mr. {McKinley.} And so building on that, what kind of
794 payback, what should someone expect to pay back on that?

795 Mr. {Koep.} On a heat pump water heater in general?

796 Mr. {McKinley.} Yes, 10 years, 15 years?

797 Mr. {Koep.} I think in the marketplace today there are
798 a lot of incentives for heat pump water heaters, and
799 generally heat pump water heaters are operating at twice the
800 efficiency of electric resistance. So most of our experience
801 is with 50-gallon heat pump water heaters replacing standard
802 50-gallon electric resistance. And I think payback is less
803 than 5 years.

804 Mr. {McKinley.} Even in a place other than--in West
805 Virginia, we are probably paying around 7 cents a kilowatt
806 hour, but in New York it is 19, 20 cents a kilowatt hour. So
807 are you saying generally speaking across the country or are
808 you talking--

809 Mr. {Koep.} Well, generally, I am saying that there
810 are--as an example in Iowa, there are a number of
811 cooperatives that have \$500 rebates on heat pump water
812 heaters. So they are buying down the cost of this
813 technology, and that is what makes the payback period more
814 attractive. In the Pacific Northwest we have seen \$900
815 rebates on heat pump water heaters. But that has helped to
816 make them more cost effective and reduce the payback time.
817 But the fact remains that, you know, trying to control a heat
818 pump water heater for grid-enabled functionality, that has
819 not been worked out yet.

820 Mr. {McKinley.} Okay.

821 Mr. {Koep.} And that is the major difficulty.

822 Mr. {McKinley.} Mr. Nadel?

823 Mr. {Nadel.} Yes. Department of Energy did examine the
824 exact question you ask, and they estimate the average simple
825 payback is 6 years for a heat pump water heater. That is the
826 average. If it is more expensive electricity, it will be
827 less. If it is only 7 cents a kilowatt hour, it will be
828 more.

829 Mr. {McKinley.} Yeah.

830 Mr. {Nadel.} I think that is based on about 11 cents as
831 I recall, average.

832 Mr. {McKinley.} Mr. Koep, back on, you know, we
833 received some promotion--my former firm, we had an
834 architectural engineering practice, and so we were always
835 being promoted to put those in-line electric units so that
836 weren't storing water. We never used those, but how
837 inefficient are they to be able to have instant hot water
838 instead of having a 50- or 100-gallon tank sitting there
839 trying to maintain a low temp or a high temperature for a
840 period of time? How inefficient is it to have just simply
841 the in-line augmented?

842 Mr. {Koep.} The in-line or instantaneous electric water
843 heating technology at an efficiency level is very high in
844 terms of converting kilowatt hours, you know, to BTUs. But

845 the general consensus is that whole-house applications of
846 instantaneous electric or electric tankless, they cause
847 problems in terms of transformer sizing, demand charges for
848 the home or the business, impact for the cooperative or the
849 utility. Most electric tankless technologies that I refer to
850 as point-of-use are the ones who have the best application
851 because you can run one line to one location and put a point-
852 of-use water heater in for a lavatory or for hand-washing or
853 something like that. But whole-house applications have been
854 problematic.

855 Mr. {McKinley.} Okay. The last question more is about
856 efficiency. What should we be anticipating in the industry,
857 should be the next move in efficiency, whether it is hot
858 water heaters or other appliances that we have in our
859 households? What is the next generation of efficiency we
860 should be anticipating?

861 Mr. {Koep.} Well, I think heat pump water heater
862 technologies will continue to gain in efficiency. In 5
863 years, you know, they have moved from 2.0 to somewhere over
864 3.0 in terms of performance factor meaning that for every
865 kilowatt hour you provide to that compressor, you can move 3
866 kilowatt hours' worth of heat. So I would say that is
867 probably going to be the major improvement. I don't see a
868 new major technology on the horizon. I think that, you know,

869 the introduction of water heaters to the internet of things
870 and high-speed two-way communication to the appliance offer
871 us multiple levels of efficiencies that we can explore. But
872 in terms of raw technology, you know, it has taken us 20, 25,
873 30 years to get heat pump water heaters into the market.

874 Mr. {McKinley.} Sure. Mr. Nadel, do you have a comment
875 about that?

876 Mr. {Nadel.} I totally agree with that. I just expand
877 slightly for gas water heaters. We have condensing water
878 heaters. During the break a number of us were talking about
879 opportunities to meld the water heater with the space heating
880 and cooling systems, combination appliances. So this is
881 something--

882 Mr. {McKinley.} Eventually we have run out of our time,
883 but condensing and non-condensing, I would like to have more
884 discussion about that. Thank you.

885 Mr. {Whitfield.} If you would meet Mr. McKinley right
886 after the hearing to talk about that? At this time I would
887 like to introduce and recognize the gentleman from New York,
888 Mr. Tonko, for 5 minutes.

889 Mr. {Tonko.} Thank you, Mr. Chair, and welcome to our
890 panelists. Mr. Connett, what are your estimates for savings
891 to the utility and to the customer, to consumers, achieved
892 through the use of demand-response programs?

893 Mr. {Connett.} Thank you. In terms of the consumers,
894 we sell the energy that goes to these large-capacity water
895 heaters. We call them off-peak water heaters if you will.
896 We sell the energy to them at a fairly low price. And so
897 they can heat their water for around \$240 a year. And that
898 compares to say propane. And propane is rather volatile, at
899 least it is in Minnesota, or has been. And so sometimes
900 propane for that same amount of water could be \$500 or \$600
901 or \$700 cost. It would vary. In terms of natural gas, it
902 would be competitive with natural gas if you could heat your
903 water for \$240 we will do the same with an off-peak water
904 heater.

905 Mr. {Tonko.} And the savings to the utility?

906 Mr. {Connett.} Those are savings to the consumer. In
907 terms of the utility, it has to go back to this notion that
908 without these programs, we would have to buy high-cost energy
909 in the market. And the notion is is that we have a peak at
910 every utility every day, and that peak for a lot of co-ops
911 occurs at suppertime. That is when we are all home and we
912 are having dinner. And by the way, that is usually the
913 largest time of hot water consumption. And so if all these
914 water heaters were not able to--if we weren't able to control
915 them, they are adding to our peaks and we would have to build
916 peaking plants to serve that load or buy high-cost energy.

917 The cost to build the peaking plant for 100 megawatts is
918 about \$80 million. It gets fairly expensive to serve that
919 peak power that we can avoid.

920 Mr. {Tonko.} I hear you. Thank you. What percentage
921 of the demand-response programs used by our rural co-ops are
922 due to the use of electric thermal storage devices?

923 Mr. {Connett.} You know, I would say it this way, that
924 premier program for the co-ops, demand-side management
925 programs is water heating.

926 Mr. {Tonko.} Okay.

927 Mr. {Connett.} It is by far the most successful and the
928 most widespread program that we have.

929 Mr. {Tonko.} And in that regard, what proportion of
930 your customers participate in the demand-response programs
931 using electric thermal storage?

932 Mr. {Connett.} Yes, I can speak to Great River Energy.
933 And about 20 percent of our membership has a demand-response
934 water heater.

935 Mr. {Tonko.} And just as to how the consumers benefit
936 from the use of water heaters that are incorporated into a
937 demand-response program?

938 Mr. {Connett.} Again, for the consumer, it is cost
939 savings. They are not going to spend as much to heat hot
940 water as they would otherwise.

941 Mr. {Tonko.} Okay. And obviously the ancillary piece
942 of the avoidance of peak capacity plants, that would have to
943 be addressed.

944 For Mr. Nadel and Mr. Roy, a question about water
945 heaters and the fact that they are replaced about every 15
946 years, often when they have failed. So consumers often need
947 to make quick choices about replacement. I have a few
948 questions related to consumer purchasing. Will water heaters
949 exempted from the standard be identified as such to the
950 consumer?

951 Mr. {Roy.} Yes, there is a clear requirement for
952 labeling that is permanent, water resistant. They will know
953 for a long time. Also importantly, they won't be that
954 readily available unless they are part of a utility program
955 because there is a lock-and-key arrangement required by the
956 legislation.

957 Mr. {Tonko.} And then for either of you, will the
958 consumer know that these products will not deliver more than
959 50 percent of hot water if they are not part of a utility-
960 demand response program?

961 Mr. {Nadel.} The warning label on it says they will
962 only operate properly. I don't think it gives the exact
963 details, but it does say they will not operate properly
964 unless enrolled in a program and enabled by a technician

965 associated with that program.

966 Mr. {Tonko.} But it doesn't mention a percentage? It
967 just--

968 Mr. {Nadel.} No.

969 Mr. {Tonko.} Okay. And then consumers do use the
970 yellow energy usage information on appliances to make
971 purchasing decisions. Do these labels need to reflect the
972 dual nature of the energy usage of these systems?

973 Mr. {Nadel.} On the labels, they will have to talk
974 about their current--the energy use of these products under
975 this typical test procedure, and they give a range of
976 comparability. I have to look at the exact details of the
977 Federal Trade Commission rules to say what will be on the
978 range of comparability for these particular types of water
979 heaters.

980 Mr. {Tonko.} And if they are installed and are not part
981 of a demand-response system, aren't they less efficient than
982 the identical appliance installed as part of a demand-
983 response program?

984 Mr. {Nadel.} Yes, they are not as efficient, so they do
985 use more power that is compensated for the ability to control
986 them. But if you somehow defeat the protections which are
987 quite substantial, yes, you will get higher energy use and
988 you won't get the benefit. But we I think very carefully

989 constructed it to minimize the chances of leakage.

990 Mr. {Tonko.} Okay. Gentlemen, I thank you. With that,
991 Mr. Chairman, my time is--

992 Mr. {Whitfield.} Okay. Did you want to say anything,
993 Mr. Koep? You look like you were--

994 Mr. {Koep.} No, I don't have anything to add at this
995 time. Thank you.

996 Mr. {Whitfield.} Okay. At this time I would like to
997 recognize the gentleman from Virginia, Mr. Griffith, for 5
998 minutes.

999 Mr. {Griffith.} Thank you very much, Mr. Chairman. I
1000 appreciate you all being here, and listening to your
1001 testimony today is making me think I should go ahead and get
1002 a new hot water heater because mine clearly is not going be
1003 nearly as efficient as what you all are talking about.

1004 I am concerned about some things. The gentleman just
1005 brought up the warning label. I do think that we probably
1006 need to take a look at that and see if we can make sure we
1007 let folks know that it will go to 50 percent of efficiency if
1008 it is tampered with, and the whole lock-and-key mechanism
1009 concerns me some. I will tell you that when this was a part
1010 of a Senate amendment to a House bill, I looked at it, and
1011 fortunately the penalties do not include incarceration for
1012 trying to get around the system by doing something to the

1013 machine. But it does include a fine penalty which causes me
1014 concern. It always makes me nervous when we are mandating
1015 things. And so I am trying to figure out--and I know most
1016 consumers will just, you know, this is what is available on
1017 the market. If something happens, their plumber tells them
1018 this is what you need to buy. They will buy that or they
1019 will go to the Home Depot and get something off the shelf.
1020 But if somebody really wants to have 100 gallons ready
1021 whenever they want it, what would keep them from buying two,
1022 50-gallon hot water heaters under this program or this bill?

1023 Mr. {Koep.} Thank you for the question. There is
1024 nothing that stops a consumer from buying two smaller-
1025 capacity water heaters. There is nothing that prevents them
1026 from buying a commercial water heater and putting it into
1027 their residence.

1028 Mr. {Griffith.} Let me ask that question because I am
1029 trying to find answers, and anytime the government is
1030 mandating stuff, it makes me nervous. So if I wanted to buy
1031 a commercial hot water heater, this wouldn't be a problem?

1032 Mr. {Koep.} No. This relates specifically to
1033 residential. This goes back to the DOE ruling which is
1034 specifically for residential--

1035 Mr. {Griffith.} But I could put a commercial hot water
1036 heater into my residence?

1037 Mr. {Koep.} My understanding, there is no law that
1038 prevents a homeowner from buying a commercial water heater,
1039 gas or electric, and putting it into their residence.

1040 Mr. {Griffith.} Okay. Now, let me ask this because I
1041 know a lot of people will have this question, too. I read
1042 somewhere that if you have the heat pump type water heater
1043 and it is in an area that is normally heated, it may actually
1044 cool the air a little bit as well. Is that accurate?

1045 Mr. {Koep.} A heat pump water heater will cool and
1046 dehumidify the space that it resides in because it is pulling
1047 heat out of that space and putting it into the tank. There
1048 are some ducting options that are being developed for heat
1049 pump water heaters that would allow them to pull outside air
1050 in and expel, you know, cool air. You know, so the
1051 technology is evolving in that direction. But most of the
1052 technology that is on the market today does cool and
1053 dehumidify the space that it resides in.

1054 Mr. {Griffith.} Okay. And so when you say that the
1055 unit would cost more if you had it say in the middle of your
1056 basement and you converted the basement or the house had a
1057 basement converted into a living space, you would have to
1058 spend some more money getting the outside air brought in so
1059 that you wouldn't cool your basement where perhaps your
1060 daughter has taken up residency? Just saying.

1061 Mr. {Koep.} Well--go ahead.

1062 Mr. {Nadel.} Yes. A good question. In fact, there was
1063 a study published just a few weeks ago in the Pacific
1064 Northwest looking at this issue. It found that yes, it does
1065 occur. It was relatively rare. As I recall, they found out
1066 across a sample of homes with heat pump water heaters in the
1067 Northwest relatively cold, instead of getting that co-
1068 efficient performance of two when you factor this in, it
1069 might be 1.9 or something.

1070 Mr. {Griffith.} All right.

1071 Mr. {Nadel.} On average.

1072 Mr. {Griffith.} Let us translate that into that alleged
1073 daughter's bedroom area. How much is the temperature going
1074 to drop? Are we talking 1 degree or we talking, you know,
1075 she is going to notice 10 degrees cooler? Do we know?

1076 Mr. {Connett.} I should speak for Minnesota. And we
1077 have installed a number of heat pump water heaters in
1078 employees' homes just to get a sense of how well they do
1079 work, and there is no doubt about it. In Minnesota, every
1080 water heater is in a basement, and those basements are
1081 conditioned. And we heat those basements. And so to put a
1082 heat pump water heater into I will call it the furnace room,
1083 it is going to cool that furnace room down quite a bit. It
1084 has been described as I can hang dead deer in there now. It

1085 is cold. And what it is doing is a heat pump water heater
1086 extracts heat from that room. That is what a heat pump does.
1087 It extracts heat and puts that heat into the water heater.

1088 Think of a refrigerator for a minute. That is
1089 extracting heat from inside the refrigerator and putting it
1090 into your kitchen. That is a heat pump in action. This is
1091 another heat pump. It is going to extract heat from its
1092 environment. You need a fairly--the heat pump manufacturers
1093 will tell you, you need so much area in your furnace room to
1094 have a heat pump water heater because it has to extract heat
1095 from that space, and it is going to condense it and squeeze
1096 it all together and put it into the water heater. So that
1097 mechanical room is going to be a little cool. And that might
1098 spill over into the family room or the living room down in
1099 the basement as well.

1100 Mr. {Griffith.} All right. I do appreciate it. Thank
1101 you all so much for being here. We are all trying to be more
1102 efficient, but we want to make sure we balance out all the
1103 interests concerned. Thank you so much. I yield back.

1104 Mr. {Whitfield.} Thank you, Mr. Griffith. At this
1105 time, I recognize the gentleman from Texas, Mr. Green, for 5
1106 minutes.

1107 Mr. {Green.} Thank you, Mr. Chairman. I would like to
1108 put my statement into the record, and I can go straight to

1109 questions.

1110 [The prepared statement of Mr. Green follows:]

1111 ***** COMMITTEE INSERT *****

|
1112 Mr. {Green.} Mr. Roy, I have some questions, and I have
1113 to admit, coming from Texas and refining and oil, we normally
1114 don't agree with the NRDC. But today that is a different
1115 case. Does NRDC have a sense of why new efficiency standards
1116 were proposed by DOE?

1117 Mr. {Roy.} There have been a series of efficiency
1118 standards on increasing numbers--

1119 Mr. {Green.} I was just going to say.

1120 Mr. {Roy.} --in 1987, signed into law by President
1121 Regan. This is an update on the water heater standards that
1122 were first put in then.

1123 Mr. {Green.} In 1987?

1124 Mr. {Roy.} Yeah.

1125 Mr. {Green.} We would hope the technology has changed
1126 since then.

1127 Mr. {Roy.} The technology is moving at a quick pace but
1128 in part because of this. I think the major manufacturers now
1129 are introducing products. Vaughn is introducing great new
1130 products in the heat pump water heater space and condensing
1131 gas water heaters. It really is moving.

1132 Mr. {Green.} Your thoughts on the DOE proposed water
1133 authority for water heaters. Is that something you all
1134 support?

1135 Mr. {Roy.} We talked to the other stakeholders, the
1136 manufacturers, the utilities consumer groups, other
1137 efficiency environment groups after it was brought to our
1138 attention that there was a challenge with the DOE standard.
1139 We heard what they said. It made sense to us. So we worked
1140 together to support a waiver approach by DOE under their
1141 existing legislation. We would still like to see that move
1142 forward.

1143 Mr. {Green.} Okay. Mr. Koep, on your position as
1144 National Utility Sales Manager, can you describe what the
1145 U.S. water heater market looks like? For example, coming
1146 from Texas, we don't mind--how many natural gas versus
1147 electric water heaters are sold. Have we seen it in the last
1148 few years particularly with the cost of natural gas cheaper?

1149 Mr. {Koep.} I think that would have been expected, but
1150 from what I have seen from the industry numbers, it is still
1151 roughly a half-and-half market, that half is electric and
1152 half is natural gas. It varies greatly by region. The
1153 Pacific Northwest has much more electric water heating. If
1154 you go to California, it might be 95 percent gas. There is
1155 also a split between rural and urban. Metro areas are
1156 usually decidedly more gas water heating because natural gas
1157 is readily available.

1158 Mr. {Green.} Pipelines are available and everything

1159 else.

1160 Mr. {Koep.} Yes. But on the national average that I
1161 have seen, it hasn't moved much from just about a 50-50 split
1162 between gas and electric, and that is sustained over the
1163 years.

1164 Mr. {Green.} Okay. What is the standard size for a
1165 home now? Because I know I have heard over the years our
1166 homes have gotten so much bigger compared to the last
1167 generation. What is the standard size of a water heater now?

1168 Mr. {Koep.} The 50-gallon electric is still the most
1169 popular size, and you know, it might be 80 or 85 percent of
1170 the marketplace. But this is an uncontrolled 50-gallon
1171 electric water heater generally not part of a demand-response
1172 program or an off-peak program because of the size
1173 limitation. On the gas side I think the most popular
1174 historically has been the 40-gallon gas, but I think that is
1175 moving--both electric and gas seem to be slightly toward
1176 larger capacity units because we are building larger houses,
1177 and we have more uses for hot water within the home.

1178 Mr. {Green.} Yeah. What are the market share for new
1179 technologies like the tankless and heat pump water heaters,
1180 the pump heaters?

1181 Mr. {Koep.} That is a great question, and we talk about
1182 that at the ACEEE Hot Water Forum that they hold fairly

1183 regularly. Tankless gas technology was introduced roughly 15
1184 years ago, and they spent a lot of money promoting that
1185 technology, and it is just within the last couple years they
1186 have gotten about 5 percent market share or now they might be
1187 slightly above that. So you know, that concerted effort has
1188 garnered them some market share.

1189 Heat pump water heaters as a generally available
1190 technology has only been in the market about 5 years, and
1191 after 5 years, they are just approaching or have just gone
1192 over the 1 percent market share mark. So despite all the
1193 best efforts and the money and the promotion and the
1194 education efforts, there seems to be a regular schedule for
1195 technology adoption by the American public. Nobody is
1196 running out to buy the newest water heater. People buy a
1197 water heater when they need one.

1198 Mr. {Green.} When they need it, yeah. Okay. Given
1199 that the DOE standards take effect next month, have the
1200 supply chains for larger water heaters closed down or do you
1201 think that it -- because sometimes when the standards change,
1202 the supply is not there because plants haven't been doing it.
1203 Do you think there is enough supply to match what the DOE is
1204 doing?

1205 Mr. {Koep.} Well, I think the supply chains are
1206 beginning to be impacted. A lot of the electric cooperatives

1207 and utilities that buy product directly for their programs
1208 had preordered in order to put in a stock of qualifying
1209 products so that when the rule goes into effect, they would
1210 not be immediately impacted. In terms of the manufacturers
1211 and the supply chains, they are already making the changes.

1212 Vaughn is a very small manufacturer. You know, the big
1213 players in the industry, A. O. Smith and Rheem, you know,
1214 they are 80 percent or more of the water heating market with
1215 two companies. So you know, their production facilities, you
1216 know, they can stop building large-capacity residential, but
1217 they will still be building large-capacity commercial units.
1218 So the impact will not be that great.

1219 Mr. {Green.} Okay. I know I am over time. Thank you,
1220 Mr. Chairman.

1221 Mr. {Whitfield.} Notice how patient we are, Mr. Green.
1222 Well, that concludes the questions today, and I want to thank
1223 the panel for joining us and for your input and working with
1224 us in trying to formulate this legislation. And we look
1225 forward to working with you as we move forward, and we will
1226 keep the record open for 10 days for any material that needs
1227 to be inserted, and that will conclude today's hearing.
1228 Thank you very much.

1229 [Whereupon, at 11:34 a.m., the Subcommittee was
1230 adjourned.]