WEBVTT

1 00:00:00.930 --> 00:00:02.290 - It's our great pleasure today

2 00:00:02.290 --> 00:00:05.380 to have our speaker, Ruth Santiago

3 00:00:05.380 --> 00:00:08.833 from Comite Dialogo Ambiental.

4 00:00:08.833 --> 00:00:13.833 Also as a renowned lawyer and environmental health advocate,

5 00:00:14.060 --> 00:00:18.800 Ruth is a resident of the municipality Salinas

6 00:00:18.800 --> 00:00:23.130 in Puerto Rico, where she has worked with community

7 00:00:23.130 --> 00:00:26.190 and environmental organizations, fisheries associations

8 00:00:26.190 --> 00:00:29.830 and many other groups over the past 30 years

9 00:00:29.830 --> 00:00:33.200 on projects ranging from a community newspaper

10 00:00:33.200 --> 00:00:36.163 to a rooftop solar energy pilot project.

11 00:00:37.050 --> 00:00:39.770 So she has helped the establishment

12 00:00:39.770 --> 00:00:43.360 of broad alliances to prevent the water pollution

13 00:00:43.360 --> 00:00:45.980 from landfills, power plant emissions

14 00:00:45.980 --> 00:00:50.390 and the discharges and the coal combustion residual waste.

15 00:00:50.390 --> 00:00:52.080 Mrs. Santiago earned degrees

16 00:00:52.080 --> 00:00:55.580 from the Lehigh University and at Columbia Law School.

17 00:00:55.580 --> 00:00:58.070 She is also the recipient of the Sierra Club's-

18 00:00:58.070 --> 00:00:59.170 - [Whitney] We maintain the pace

19 00:00:59.170 --> 00:01:02.030 but I expect peace to actually increase.

20 00:01:02.030 --> 00:01:05.440 - Whitney, if you can mute yourself, thank you.

21 00:01:05.440 --> 00:01:07.310 - [Whitney] Yes, I'm sorry.

22 00:01:07.310 --> 00:01:10.190 - Mrs. Santiago is also the Sierra Club's

23 00:01:10.190 --> 00:01:15.190 2018 Robert Bullard Environmental Justice Award awardee.

24 00:01:15.670 --> 00:01:18.730 So without further ado, please join me

25 00:01:18.730 --> 00:01:22.123 in welcoming Ruth for giving her presentation.

26 00:01:25.380 --> 00:01:26.710 - Hello, everyone.

27 00:01:26.710 --> 00:01:30.040 Thank you, Dr. Chen and doctors Du Brow

28 00:01:30.040 --> 00:01:32.840 and for all of the students and others

29 00:01:32.840 --> 00:01:36.890 who are tuning in to this meeting.

30 00:01:36.890 --> 00:01:39.970 I'm happy to be with you

31 00:01:39.970 --> 00:01:42.100 and I'm so glad that you're interested

32 00:01:42.100 --> 00:01:45.540 in the environmental justice, climate justice

33 00:01:45.540 --> 00:01:49.040 and health issues here in Puerto Rico.

34 00:01:49.040 --> 00:01:52.220 And so what I'll do now is I'll pull up my...

35 00:01:52.220 --> 00:01:54.780 I have a presentation with some slides

36 00:01:56.090 --> 00:01:59.173 just to facilitate the talk.

37 00:02:02.540 --> 00:02:04.340 Okay. Here we go.

38 00:02:04.340 --> 00:02:08.063 So I hope, can everyone see that okay?

39 00:02:10.130 --> 00:02:11.040 - Yes.

40 00:02:11.040 --> 00:02:12.500 - Okay, great.

41 00:02:12.500 --> 00:02:17.240 So this is obviously a talk

42 00:02:17.240 --> 00:02:22.163 about what we're working very intensely on

43 00:02:23.030 --> 00:02:26.420 and for the transformation in Puerto Rico

44 00:02:26.420 --> 00:02:30.543 of the energy system or the electric system in particular,

45 00:02:31.460 --> 00:02:34.680 and the environmental and racial justice implication,

46 00:02:34.680 --> 00:02:38.300 public health implications of the current system we have.

47 00:02:38.300 --> 00:02:40.260 But first I'm gonna go actually

48 00:02:40.260 --> 00:02:45.260 to what our community-based

49 00:02:46.140 --> 00:02:50.050 and civil society based solutions are

50 00:02:50.050 --> 00:02:54.840 for achieving environmental and racial justice

51 00:02:54.840 --> 00:02:55.970 in public health.

52 00:02:55.970 --> 00:02:57.593 Justice, you can say as well.

53 00:02:58.650 --> 00:03:00.610 Well, I love to show this map

54 00:03:00.610 --> 00:03:04.840 because sometimes people don't really know

55 00:03:04.840 --> 00:03:06.213 where Puerto Rico is.

56 00:03:07.380 --> 00:03:12.380 And so you can see here it's in the Caribbean Sea

57 00:03:13.190 --> 00:03:16.650 and it's called the smallest of the larger Antilles

58 00:03:16.650 --> 00:03:19.470 and the largest of the smaller Antilles.

59 00:03:19.470 --> 00:03:23.360 And it's a relationship on energy issues

60 00:03:23.360 --> 00:03:24.510 throughout the whole Caribbean

61 00:03:24.510 --> 00:03:26.533 which I'll discuss a little bit later.

62 00:03:27.670 --> 00:03:32.010 So as I said, I wanna go to the positive aspect here first.

63 00:03:32.010 --> 00:03:34.940 And I'm sort of using this terminology

64 00:03:34.940 --> 00:03:38.010 about a Green New Deal

65 00:03:38.010 --> 00:03:40.560 and applying it to the local context

66 00:03:41.480 --> 00:03:43.870 to talk about the work that I'm doing

67 00:03:43.870 --> 00:03:46.110 with not only Comite Dialogo Ambiental

68 00:03:46.110 --> 00:03:49.580 but other community, environmental, civil society groups

69 00:03:49.580 --> 00:03:53.260 in general, which I'll show you in a little while

70 00:03:53.260 --> 00:03:57.870 the list of at least the founding organizations.

71 00:03:57.870 --> 00:04:02.870 So basically, we are proposing community empowerment

72 00:04:03.760 --> 00:04:05.940 through participation in the electric system

73 00:04:05.940 --> 00:04:08.990 as what are known as prosumers,

74 00:04:08.990 --> 00:04:12.720 not just passive consumers, but communities,

75 00:04:12.720 --> 00:04:15.360 people being able to participate

76 00:04:15.360 --> 00:04:18.170 in the electric system as producers.

77 00:04:18.170 --> 00:04:22.193 And that usually means with rooftop solar,

78 00:04:23.420 --> 00:04:26.800 and often coupled with battery energy storage systems.

79 00:04:26.800 --> 00:04:31.160 And although we have been working for quite a few years

80 00:04:31.160 --> 00:04:36.160 on this proposal, obviously with Hurricane Maria

81 00:04:36.590 --> 00:04:39.130 in September of 2017

82 00:04:40.780 --> 00:04:43.720 and other so-called natural disasters.

83 00:04:43.720 --> 00:04:46.840 And I say so-called, because hurricanes of course

84 00:04:48.340 --> 00:04:50.240 are natural phenomena,

85 00:04:50.240 --> 00:04:53.730 but we know that they are being aggravated.

86 00:04:53.730 --> 00:04:56.340 They're becoming more intense and more frequent

87 00:04:56.340 --> 00:04:58.723 with the climate crisis.

88 00:04:59.600 --> 00:05:02.880 So what happened, especially after Hurricane Maria

89 00:05:02.880 --> 00:05:04.980 although it's happened for the past 30 years

90 00:05:04.980 --> 00:05:09.083 that I can recall is that the electric grid,

91 00:05:11.520 --> 00:05:13.720 what what was known as the transmission

92 00:05:13.720 --> 00:05:16.433 and distribution system, T&D system,

93 00:05:17.630 --> 00:05:20.870 was totally impacted, brought down

94 00:05:20.870 --> 00:05:25.700 and was not able to transmit or distribute power

95 00:05:25.700 --> 00:05:26.923 throughout the island.

96 00:05:28.050 --> 00:05:33.050 And so there were many lessons that we learned

97 00:05:33.790 --> 00:05:35.250 and one of them was certainly

98 00:05:35.250 --> 00:05:39.370 that communities must become energy literate

99 00:05:39.370 --> 00:05:44.370 and can actually implement measures

100 00:05:44.440 --> 00:05:48.930 to mitigate, to some extent, the damages

101 00:05:48.930 --> 00:05:53.930 related to these centralized fossil fuel-based

102 00:05:56.140 --> 00:05:58.710 energy systems that we see

103 00:05:58.710 --> 00:06:01.123 and that prevails here in Puerto Rico.

104 00:06:02.270 --> 00:06:05.970 So communities should be active participants.

105 00:06:05.970 --> 00:06:08.467 And our public utility, which is known as PREPA

106 00:06:08.467 --> 00:06:11.130 the Puerto Rico Electric Power Authority.

107 00:06:11.130 --> 00:06:14.360 Another big lesson learned was that PREPA needs

108 00:06:14.360 --> 00:06:17.280 a radical transformation, both in terms

109 00:06:17.280 --> 00:06:21.780 of the technology that it uses and as to its governance,

110 00:06:21.780 --> 00:06:23.330 to be more representative

111 00:06:23.330 --> 00:06:25.963 of the civil society sectors here in Puerto Rico.

112 00:06:27.030 --> 00:06:32.030 And then of course, after every major disaster

113 00:06:32.380 --> 00:06:35.515 declaration or situation that has happened here

114 00:06:35.515 --> 00:06:36.910 in Puerto Rico, and as Puerto Rico

115 00:06:36.910 --> 00:06:39.800 is a territory of the United States,

116 00:06:39.800 --> 00:06:41.675 And by the way, we are,

117 00:06:41.675 --> 00:06:44.783 Puerto Ricans are American citizens, US citizens.

118 00:06:46.740 --> 00:06:49.670 The federal agencies came in,

119 00:06:49.670 --> 00:06:52.100 both the Federal Emergency Management Agency

120 00:06:52.100 --> 00:06:54.430 and Housing and Urban Development,

121 00:06:54.430 --> 00:06:58.400 to provide funding which did not materialize.

122 00:06:58.400 --> 00:07:01.150 And to a large extent,

123 00:07:01.150 --> 00:07:06.150 especially the more permanent repairs reconstruction funding

124 00:07:08.330 --> 00:07:10.880 has not yet arrived even.

125 00:07:10.880 --> 00:07:15.880 So we are proposing that when these funds do arrive,

126 00:07:16.780 --> 00:07:19.330 do get actually transferred

127 00:07:19.330 --> 00:07:21.530 to the government of Puerto Rico,

128 00:07:21.530 --> 00:07:23.650 that, and prior to that transfer,

129 00:07:23.650 --> 00:07:27.000 that the federal government earmark those funds

130 00:07:28.300 --> 00:07:30.940 so that the public utility, PREPA,

131 00:07:30.940 --> 00:07:33.440 works with organized communities and local

132 00:07:33.440 --> 00:07:38.440 renewable energy contractors to totally transform

133 00:07:39.310 --> 00:07:43.800 the way that our electric system is built,

134 00:07:43.800 --> 00:07:48.800 and do so in a way that permits energy participation

135 00:07:51.578 --> 00:07:54.087 by prosumers, I should say, communities,

136 00:07:54.087 --> 00:07:55.780 the civil society here.

137 00:07:55.780 --> 00:07:58.320 And we call that energy democracy.

138 00:07:58.320 --> 00:08:01.600 So I actually have a little note there.

139 00:08:01.600 --> 00:08:04.440 And if anyone is interested in collaborating,

140 00:08:04.440 --> 00:08:07.770 we do need help in convincing FEMA and HUD

141 00:08:08.723 --> 00:08:10.964 to earmark those funds

142 00:08:10.964 --> 00:08:15.964 and basically enable the transformation

143 00:08:16.810 --> 00:08:17.870 of the electric system

144 00:08:17.870 --> 00:08:22.440 to a prosumer friendly approach,

145 00:08:22.440 --> 00:08:24.070 as opposed to the centralized approach

146 00:08:24.070 --> 00:08:25.440 that I'll talk about later

147 00:08:25.440 --> 00:08:28.320 and you'll see some of the slides and see what I mean.

148 00:08:28.320 --> 00:08:30.970 So, one of the reasons why

149 00:08:32.000 --> 00:08:37.000 we are proposing primarily rooftop or onsite solar,

150 00:08:38.100 --> 00:08:40.050 battery energy storage systems,

151 00:08:40.050 --> 00:08:43.650 energy efficiency programs and energy literacy programs

152 00:08:43.650 --> 00:08:47.790 is because the groups, including Comite Dialogo Ambiental,

153 00:08:47.790 --> 00:08:49.450 but also many other groups,

154 00:08:49.450 --> 00:08:51.700 about 10 other groups that we're working with

155 00:08:53.160 --> 00:08:57.700 have participated as what are known as interveners,

156 00:08:57.700 --> 00:09:00.340 formal interveners, in a process called

157 00:09:00.340 --> 00:09:04.130 the integrated resource plan for PREPA,

158 00:09:04.130 --> 00:09:06.020 Puerto Rico Electric Power Authority.

159 00:09:06.020 --> 00:09:10.990 And so many jurisdictions have these very intense

160 00:09:10.990 --> 00:09:15.297 planning processes for the future of the electric grids

161 00:09:15.297 --> 00:09:17.680 in their respective jurisdictions.

162 00:09:17.680 --> 00:09:22.340 So I'm pretty sure Connecticut has one,

163 00:09:22.340 --> 00:09:26.540 but, I shouldn't say, but many, many jurisdictions

164 00:09:26.540 --> 00:09:29.570 have public utility commissions.

165 00:09:29.570 --> 00:09:31.190 They might call them something different.

166 00:09:31.190 --> 00:09:36.100 Sometimes they're called public service commissions,

167 00:09:36.100 --> 00:09:40.770 et cetera, that require electric companies

168 00:09:40.770 --> 00:09:45.620 to submit to them the planning for say,

169 00:09:45.620 --> 00:09:48.570 maybe the next 20 years, the period can vary.

170 00:09:48.570 --> 00:09:52.930 But it's to try to determine what the energy needs will be

171 00:09:52.930 --> 00:09:54.240 in a certain timeframe.

172 00:09:54.240 --> 00:09:56.130 Although usually there's like an action plan

173 00:09:56.130 --> 00:09:58.220 for the first five years

174 00:09:58.220 --> 00:10:01.650 and the document obviously can be revised

175 00:10:01.650 --> 00:10:03.560 in three years sometimes.

176 00:10:03.560 --> 00:10:05.550 That's the case here.

177 00:10:05.550 --> 00:10:07.610 And as it's a pretty sophisticated process

178 00:10:07.610 --> 00:10:09.980 that requires a lot of inputs

179 00:10:09.980 --> 00:10:14.980 in terms of demand projections, energy demand projections,

180 00:10:15.600 --> 00:10:17.340 evaluating the current fleet,

181 00:10:17.340 --> 00:10:22.340 determining new technologies, forecasting fuel prices,

182 00:10:22.940 --> 00:10:25.570 et cetera, et cetera, just population trends,

183 00:10:25.570 --> 00:10:28.610 just a lot of inputs in order to come out,

184 00:10:28.610 --> 00:10:33.173 and modeling, to determine what the best mix

185 00:10:34.060 --> 00:10:37.560 of energy infrastructure or programs.

186 00:10:37.560 --> 00:10:40.460 It can be non-wire alternatives

187 00:10:42.560 --> 00:10:44.860 which if you wanna get into that,

188 00:10:44.860 --> 00:10:49.240 we can talk about those, but basically we participated

189 00:10:49.240 --> 00:10:52.000 in this process, both in the first one

190 00:10:52.000 --> 00:10:55.750 and now on the second proceeding and discovered

191 00:10:55.750 --> 00:11:00.680 that PREPA's contractors, Siemens Industry,

192 00:11:00.680 --> 00:11:05.680 actually found that onsite, customer-sited alternatives,

193 00:11:07.010 --> 00:11:08.440 that's basically rooftop solar.

194 00:11:08.440 --> 00:11:10.890 Could be micro wind as well.

195 00:11:10.890 --> 00:11:15.890 Customer-sited alternatives are the most economic option

196 00:11:15.930 --> 00:11:19.930 in Puerto Rico for energy generation.

197 00:11:19.930 --> 00:11:22.240 And it would be significantly lower

198 00:11:22.240 --> 00:11:26.840 than the total rate that PREPA would charge rate payers

199 00:11:28.700 --> 00:11:31.453 if say, we did business as usual.

200 00:11:33.220 --> 00:11:36.220 But it's something that we never understood

201 00:11:36.220 --> 00:11:38.830 in this process was that in fact, in spite of the fact

202 00:11:38.830 --> 00:11:42.800 that rooftop solar was by its own admission,

203 00:11:42.800 --> 00:11:44.930 the PREPA's contractor, Siemens Industry,

204 00:11:44.930 --> 00:11:47.180 saying this is the cheapest way,

205 00:11:47.180 --> 00:11:49.900 at the end of the 20-year planning period,

206 00:11:49.900 --> 00:11:53.730 they only included about 10%

207 00:11:53.730 --> 00:11:58.730 of onsite or customer-sited solar or energy generation

208 00:11:59.010 --> 00:12:02.050 in the generation mix at the end of the planning period.

209 00:12:02.050 --> 00:12:04.070 So this made no sense to us.

210 00:12:04.070 --> 00:12:07.510 And that's why we've been working very hard

211 00:12:07.510 --> 00:12:12.510 to actually push this alternative

212 00:12:12.900 --> 00:12:15.010 and steer away from the other things

213 00:12:15.010 --> 00:12:17.260 that I'll show you a little further along,

214 00:12:17.260 --> 00:12:20.538 and we have lot of support for that,

215 00:12:20.538 --> 00:12:21.860 and not the least of which

216 00:12:21.860 --> 00:12:26.860 is a recent National Renewable Energy Labs study

217 00:12:26.930 --> 00:12:30.180 that indicates that Puerto Rico has four to five times

218 00:12:30.180 --> 00:12:35.180 the rooftop potential or residential solar potential

219 00:12:40.140 --> 00:12:44.150 than the actual demand on the island.

220 00:12:44.150 --> 00:12:45.920 And that over a decade ago,

221 00:12:45.920 --> 00:12:48.701 faculty at the University of Puerto Rico said

222 00:12:48.701 --> 00:12:50.120 pretty much the same thing

223 00:12:50.120 --> 00:12:53.253 and coined this phrase about the rooftop resource.

224 00:12:54.260 --> 00:12:55.480 Any of you who've been here

225 00:12:55.480 --> 00:12:57.070 or know anything about Puerto Rico

226 00:12:57.070 --> 00:12:58.690 is as you saw on the map,

227 00:12:58.690 --> 00:13:01.750 it's a limited geographic extension

228 00:13:01.750 --> 00:13:06.750 but very sprawling kind of development.

229 00:13:08.280 --> 00:13:11.130 You might call it the LA model of development.

230 00:13:11.130 --> 00:13:16.130 Sprawling housing projects and the commercial centers.

231 00:13:17.000 --> 00:13:19.993 And so there's lots of rooftop space here.

232 00:13:22.200 --> 00:13:25.770 And what we've also been able to show

233 00:13:25.770 --> 00:13:28.930 is that renewables plus storage

234 00:13:28.930 --> 00:13:31.400 can supply even the critical energy needs.

235 00:13:31.400 --> 00:13:34.223 That is hospitals, first responders,

236 00:13:35.560 --> 00:13:38.380 water supply, et cetera.

237 00:13:38.380 --> 00:13:42.260 And that coupled with energy efficiency programs,

238 00:13:42.260 --> 00:13:46.000 smart metering, demand response time reviews

239 00:13:46.000 --> 00:13:50.853 can even reduce further the need for energy generation.

240 00:13:51.914 --> 00:13:53.560 I'm sorry for all this wording on the slide.

241 00:13:53.560 --> 00:13:56.100 So basically, let's see, did I jump?

242 00:13:58.980 --> 00:14:01.340 Okay, where am I here?

243 00:14:01.340 --> 00:14:02.173 Okay.

244 00:14:02.173 --> 00:14:05.560 So yeah, this is a simple sort of representation

245 00:14:05.560 --> 00:14:06.900 of what we're saying.

246 00:14:06.900 --> 00:14:11.030 People can now participate in energy generation.

247 00:14:11.030 --> 00:14:13.030 And at the community level, it's even better

248 00:14:13.030 --> 00:14:17.210 because we can have micro grids in case for whatever reason,

249 00:14:17.210 --> 00:14:19.473 given rooftops are not appropriate.

250 00:14:20.700 --> 00:14:22.380 And so this is another way

251 00:14:22.380 --> 00:14:25.250 to explain basically the same thing.

252 00:14:25.250 --> 00:14:28.830 We're really talking about beyond technology.

253 00:14:28.830 --> 00:14:30.190 A technological change.

254 00:14:30.190 --> 00:14:32.240 This is not just a techno change,

255 00:14:32.240 --> 00:14:33.820 not just going to renewables.

256 00:14:33.820 --> 00:14:37.563 Not all renewables are sustainable, we posit.

257 00:14:38.690 --> 00:14:41.403 Because first of all,

258 00:14:44.250 --> 00:14:47.360 we are not in favor necessarily

259 00:14:47.360 --> 00:14:50.460 of land-based renewable energy systems

260 00:14:50.460 --> 00:14:55.233 and actually don't favor that for many, many reasons.

261 00:14:56.390 --> 00:15:00.410 And we do believe that it's more sustainable

262 00:15:00.410 --> 00:15:04.050 to use existing structures and not impact open land

263 00:15:04.050 --> 00:15:08.390 or ecologically sensitive areas or agricultural land.

264 00:15:08.390 --> 00:15:11.210 I know California has a similar provision

265 00:15:11.210 --> 00:15:13.690 about protection for agricultural lands.

266 00:15:13.690 --> 00:15:18.140 And we do favor, as I mentioned, community shared solar

267 00:15:18.140 --> 00:15:23.140 so that the socioeconomic benefits of this generation

268 00:15:24.090 --> 00:15:26.163 is received by the communities.

269 00:15:29.300 --> 00:15:34.123 And it entails citizen empowerment.

270 00:15:35.180 --> 00:15:37.240 Coupled with this technology

271 00:15:37.240 --> 00:15:39.503 to achieve social and environmental justice.

272 00:15:41.060 --> 00:15:44.960 And so this is the actual site

273 00:15:44.960 --> 00:15:47.080 for our civil society proposal.

274 00:15:47.080 --> 00:15:48.520 It's called Queremos Sol.

275 00:15:48.520 --> 00:15:50.500 We want sun is the translation.

276 00:15:50.500 --> 00:15:54.320 And the groups, the founding groups are down here.

277 00:15:54.320 --> 00:15:58.160 And they include not just community environmental groups,

278 00:15:58.160 --> 00:16:02.290 but also you will see that the PREPA,

279 00:16:02.290 --> 00:16:05.130 the largest PREPA union is here.

280 00:16:05.130 --> 00:16:09.800 The Professional Workers Association,

281 00:16:09.800 --> 00:16:12.720 faculty members at the University of Puerto Rico,

282 00:16:12.720 --> 00:16:15.060 the Institute for Energy Economics

283 00:16:15.060 --> 00:16:17.113 and Financial Analysis, et cetera.

284 00:16:18.320 --> 00:16:21.940 Alright, so that was the...

285 00:16:21.940 --> 00:16:24.620 I wanted to put the solutions first.

286 00:16:24.620 --> 00:16:26.520 I think it's important that people know

287 00:16:26.520 --> 00:16:29.700 that we we have a very viable alternative

288 00:16:29.700 --> 00:16:31.780 that we've studied very closely

289 00:16:31.780 --> 00:16:35.300 and are convinced that it can be implemented.

290 00:16:35.300 --> 00:16:39.623 But, now bringing you back to where we are,

291 00:16:41.690 --> 00:16:46.690 we have in Puerto Rico about 97% fossil fuel generation

292 00:16:50.350 --> 00:16:52.483 in terms of energy supply.

293 00:16:53.810 --> 00:16:58.810 And part of that is a coal burning power plant called AES.

294 00:16:59.010 --> 00:17:02.090 It's headquartered in Arlington, Virginia.

295 00:17:02.090 --> 00:17:03.780 The full name is Applied Energy Systems,

296 00:17:03.780 --> 00:17:07.803 but the plant here is called AES Puerto Rico.

297 00:17:08.650 --> 00:17:13.650 And it's been a very problematic operation

298 00:17:15.877 --> 00:17:18.760 both in terms of an environmental,

299 00:17:18.760 --> 00:17:23.760 health and racial aspects and I'll explain why.

300 00:17:23.840 --> 00:17:28.840 I'll start this with a trip that we participated in

301 00:17:30.010 --> 00:17:32.883 to Colombia, South America,

302 00:17:34.710 --> 00:17:36.920 which happens to be the fifth largest exporter

303 00:17:36.920 --> 00:17:37.890 of coal in the world.

304 00:17:37.890 --> 00:17:39.540 And they export just all over.

305 00:17:39.540 --> 00:17:42.960 Turkey, Ireland, Puerto Rico, the US everywhere.

306 00:17:42.960 --> 00:17:47.960 And we actually visited El Cerrejon in La Guajira,

307 00:17:48.050 --> 00:17:50.630 which is one of the largest open pit mines in the world.

308 00:17:50.630 --> 00:17:54.680 But a lot of the coal that is burned here by the AES plant

309 00:17:54.680 --> 00:17:56.913 and here in southeastern Puerto Rico is,

310 00:17:58.070 --> 00:18:01.210 it comes from El Cesar in Colombia as well.

311 00:18:01.210 --> 00:18:02.330 And so these are...

312 00:18:03.810 --> 00:18:06.083 As you can see,

313 00:18:09.010 --> 00:18:10.490 transnational companies,

314 00:18:10.490 --> 00:18:12.950 like really big names in the energy field.

315 00:18:12.950 --> 00:18:15.120 BHP Billington, Anglo American, Glencore.

316 00:18:15.120 --> 00:18:17.590 Those are European, but previously it was ExxonMobil

317 00:18:17.590 --> 00:18:20.600 that was operating at Cerrejon.

318 00:18:20.600 --> 00:18:24.320 And they pay royalties to the Colombian government

319 00:18:24.320 --> 00:18:28.700 but the impacts have been just terrible

320 00:18:28.700 --> 00:18:31.340 in terms of public health there

321 00:18:31.340 --> 00:18:33.620 and displacement of the Wayuu

322 00:18:33.620 --> 00:18:35.593 and Afro-descendant communities.

323 00:18:36.560 --> 00:18:38.073 Many of the communities claim

324 00:18:38.073 --> 00:18:41.630 there've been no previous consultation or informed consent

325 00:18:41.630 --> 00:18:44.193 in order to use their lands, their water,

326 00:18:45.300 --> 00:18:47.400 the water resources that we saw,

327 00:18:47.400 --> 00:18:51.180 and I'll show you a photograph terribly impacted.

328 00:18:51.180 --> 00:18:55.970 And in addition to that, when we visited the mine

329 00:18:55.970 --> 00:18:57.423 and all of the open pits,

330 00:18:58.690 --> 00:19:01.530 we saw that there's a lot of water usage

331 00:19:01.530 --> 00:19:04.020 to do a lot of dust control at the mine.

332 00:19:04.020 --> 00:19:07.100 And yet outside in the towns nearby,

333 00:19:07.100 --> 00:19:10.140 people often do not have running water.

334 00:19:10.140 --> 00:19:13.700 So terrible environmental justice issue there.

335 00:19:13.700 --> 00:19:18.700 And this is the smallest open pit mine, El Tajo Patilla,

336 00:19:20.100 --> 00:19:21.430 they call it.

337 00:19:21.430 --> 00:19:26.430 And Dr. Hilda Lorenz and I participated in this meeting

338 00:19:28.980 --> 00:19:33.390 with a group called witness for peace

339 00:19:34.430 --> 00:19:37.543 organized by Dr. Aviva Chomsky.

340 00:19:38.700 --> 00:19:42.600 And so this is one of the tributaries

341 00:19:42.600 --> 00:19:45.808 to Rio Rancheria that we saw

342 00:19:45.808 --> 00:19:47.800 a couple of years ago on our trip,

343 00:19:47.800 --> 00:19:49.140 and that has now been...

344 00:19:49.140 --> 00:19:50.160 It was in the process.

345 00:19:50.160 --> 00:19:52.960 There was an ongoing controversy

346 00:19:52.960 --> 00:19:56.440 about whether the mine could change the course

347 00:19:56.440 --> 00:19:58.370 of this tributary and it did,

348 00:19:58.370 --> 00:20:01.420 and this would be the 14th tributary

349 00:20:01.420 --> 00:20:05.910 that was impacted by the mining operations.

350 00:20:05.910 --> 00:20:10.190 And so people understandably are very concerned

351 00:20:10.190 --> 00:20:11.640 about their lack of access to water.

352 00:20:11.640 --> 00:20:12.760 You can see in the sign.

353 00:20:12.760 --> 00:20:15.957 It says, "We're defending our access to water."

354 00:20:16.950 --> 00:20:21.950 And the mining companies basically are the primary culprits

355 00:20:22.900 --> 00:20:26.100 for the lack of access to water in Colombia,

356 00:20:26.100 --> 00:20:28.290 in those mining communities.

357 00:20:28.290 --> 00:20:30.200 So let's get back to Puerto Rico.

358 00:20:30.200 --> 00:20:34.900 And as you can see, this is sort of a picture

359 00:20:34.900 --> 00:20:38.320 of the trajectory of the hurricanes in the past.

360 00:20:38.320 --> 00:20:40.473 I think this is the past 100 years.

361 00:20:41.820 --> 00:20:44.500 And they all usually come in through the east

362 00:20:44.500 --> 00:20:46.360 and then go out through the west.

363 00:20:46.360 --> 00:20:49.610 And the next slide will show you what that means

364 00:20:49.610 --> 00:20:51.540 in terms of the electric system.

365 00:20:51.540 --> 00:20:54.240 So these are the major electric lines.

366 00:20:54.240 --> 00:20:57.930 I'm here in Salinas and AS is here in Guayama.

367 00:20:57.930 --> 00:20:59.107 This is southwestern Puerto Rico.

368 00:20:59.107 --> 00:21:00.940 And what you can see, these big, blue lines,

369 00:21:00.940 --> 00:21:03.550 they're high voltage transmission lines.

370 00:21:03.550 --> 00:21:05.390 So Puerto Rico has a peculiarity

371 00:21:05.390 --> 00:21:07.480 that most of its energy generation

372 00:21:07.480 --> 00:21:08.720 is on the southern coastal.

373 00:21:08.720 --> 00:21:12.040 You see those big numbers, those are the big power plants.

374 00:21:12.040 --> 00:21:16.410 And most of its energy demand is on the north coast

375 00:21:16.410 --> 00:21:20.210 in the San Juan Metro area and other places in the north.

376 00:21:20.210 --> 00:21:23.400 And so these lines, think of it again,

377 00:21:23.400 --> 00:21:26.770 are impacted constantly, not just after Hurricane Maria

378 00:21:26.770 --> 00:21:31.770 by hurricanes coming in and taking down in part,

379 00:21:32.250 --> 00:21:35.330 usually it was in part, right after...

380 00:21:35.330 --> 00:21:37.020 I mean, I don't wanna go into all the detail,

381 00:21:37.020 --> 00:21:40.220 but Hurricane Hugo on, part,

382 00:21:40.220 --> 00:21:42.620 always part of these lines were impacted.

383 00:21:42.620 --> 00:21:45.260 And Hurricane Maria was, well,

384 00:21:45.260 --> 00:21:50.260 it's sort of unique in that everything went down.

385 00:21:50.830 --> 00:21:53.280 So we were 100% without power.

386 00:21:53.280 --> 00:21:55.430 So basically what we see

387 00:21:55.430 --> 00:21:57.280 is that the current electric system

388 00:21:57.280 --> 00:22:00.970 is this very centralized transmission distribution,

389 00:22:00.970 --> 00:22:03.990 lots of fossil generation.

390 00:22:03.990 --> 00:22:08.990 PREPA owns about 4,630 megawatts of fossil generation

391 00:22:09.530 --> 00:22:12.770 and about 100 megawatts of hydroelectric

392 00:22:12.770 --> 00:22:15.930 but only about 60, maybe even less are functional

393 00:22:15.930 --> 00:22:18.743 in the hydro generation.

394 00:22:20.141 --> 00:22:21.700 PREPA also has contracts.

395 00:22:21.700 --> 00:22:24.100 What they call power purchase and operation agreements

396 00:22:24.100 --> 00:22:25.580 with private companies.

397 00:22:25.580 --> 00:22:27.260 One is called EcoElectrica.

398 00:22:27.260 --> 00:22:30.440 It's a gas-fired power plant in southwestern Puerto Rico.

399 00:22:30.440 --> 00:22:32.500 And I mentioned AES,

400 00:22:32.500 --> 00:22:35.670 which I'm gonna get into more detail further along

401 00:22:35.670 --> 00:22:38.473 is a coal burning power plant.

402 00:22:40.730 --> 00:22:44.630 Also PREPA has some renewable energy projects,

403 00:22:44.630 --> 00:22:47.470 very small amount that it has

404 00:22:47.470 --> 00:22:49.720 power purchase and operation agreements with.

405 00:22:49.720 --> 00:22:52.240 Problem with these projects are not just

406 00:22:52.240 --> 00:22:55.780 the land requirements involved, but also that they depend

407 00:22:55.780 --> 00:22:57.747 on this vulnerable centralized transmission

408 00:22:57.747 --> 00:23:02.130 and distribution system, because they're sited far away

409 00:23:02.130 --> 00:23:06.140 from the the man center.

410 00:23:06.140 --> 00:23:07.480 So where the energy is needed.

411 00:23:07.480 --> 00:23:12.480 So they were also out of service after the hurricane.

412 00:23:14.340 --> 00:23:16.879 And, but there is some...

413 00:23:16.879 --> 00:23:19.150 And this has increased probably about 100 megawatts

414 00:23:19.150 --> 00:23:22.260 of installed, distributed or onsite generation.

415 00:23:22.260 --> 00:23:25.510 And that held up the best after the hurricanes.

416 00:23:25.510 --> 00:23:30.510 And we need to realize that energy demand in Puerto Rico

417 00:23:31.200 --> 00:23:34.020 is decreasing constantly.

418 00:23:34.020 --> 00:23:37.750 And it is now, right now, it's under 2000 megawatts.

419 00:23:37.750 --> 00:23:40.150 And in the summer, it goes up a little bit more,

420 00:23:40.150 --> 00:23:43.530 but as you can see, we have about three times

421 00:23:43.530 --> 00:23:48.490 the installed generation capacity as the demand.

422 00:23:48.490 --> 00:23:51.800 So this is sort of a pie chart that I prepared

423 00:23:51.800 --> 00:23:54.410 talking about our energy mix showing,

424 00:23:54.410 --> 00:23:56.580 and then what Siemens Industry

425 00:23:56.580 --> 00:23:58.490 along with PREPA were proposing.

426 00:23:58.490 --> 00:24:02.290 And it's basically a, this.

427 00:24:02.290 --> 00:24:07.290 It's a huge, huge rollout of what is known as natural gas.

428 00:24:11.250 --> 00:24:13.643 Otherwise, methane gas.

429 00:24:14.690 --> 00:24:19.690 And the gas as you know, is largely,

430 00:24:23.270 --> 00:24:28.165 the gas boom is largely a result of the fracking industry

431 00:24:28.165 --> 00:24:31.900 that especially has started.

432 00:24:31.900 --> 00:24:36.900 Or since I guess about the early 2000s

433 00:24:36.960 --> 00:24:39.680 just took off in the States and elsewhere now.

434 00:24:39.680 --> 00:24:42.620 So there's fracking in a lot of other countries as well

435 00:24:42.620 --> 00:24:47.170 and so basically a glut of fracked gas

436 00:24:47.170 --> 00:24:52.170 that is being pushed onto places like Puerto Rico,

437 00:24:53.830 --> 00:24:56.280 Jamaica, other places in the Caribbean,

438 00:24:56.280 --> 00:24:58.553 Mexico, Latin America in general.

439 00:24:59.430 --> 00:25:01.530 And this was part of Siemens' plans

440 00:25:01.530 --> 00:25:04.260 Siemens and the government of Puerto Rico plan

441 00:25:04.260 --> 00:25:08.800 in the IRP to build all of these terminals,

442 00:25:08.800 --> 00:25:12.970 both offshore, onshore, LNG terminals.

443 00:25:12.970 --> 00:25:16.120 And the reason why it's liquified natural gas

444 00:25:16.120 --> 00:25:19.080 is because you probably all know that gas

445 00:25:19.080 --> 00:25:23.590 in its liquid state is a smaller volume.

446 00:25:23.590 --> 00:25:26.630 A lot smaller, takes up a lot less space

447 00:25:26.630 --> 00:25:29.040 and that's how they can transport it

448 00:25:29.040 --> 00:25:32.230 to the Caribbean and other places.

449 00:25:32.230 --> 00:25:35.020 But so that was the plan.

450 00:25:35.020 --> 00:25:38.960 And also you probably all know

451 00:25:38.960 --> 00:25:43.810 that Puerto Rico was even before the hurricane

452 00:25:43.810 --> 00:25:47.520 in the midst of an economic and fiscal crisis,

453 00:25:47.520 --> 00:25:49.870 in addition to the climate crisis.

454 00:25:49.870 --> 00:25:51.100 We've also had earthquakes

455 00:25:51.100 --> 00:25:53.823 and now of course, the COVID pandemic.

456 00:25:55.200 --> 00:26:00.200 And unfortunately we have not been able to respond

457 00:26:00.200 --> 00:26:04.700 to all of these crises due in large part

458 00:26:04.700 --> 00:26:09.460 to the development policies that have been implemented

459 00:26:09.460 --> 00:26:12.920 since the late 1940s, starting with what was known

460 00:26:12.920 --> 00:26:17.650 as Operation Bootstrap, which centered on...

461 00:26:17.650 --> 00:26:21.380 Operation Bootstrap was a rapid industrialization project

462 00:26:21.380 --> 00:26:24.170 moving away from say, Shirky monoculture,

463 00:26:24.170 --> 00:26:26.040 which was what happened

464 00:26:26.040 --> 00:26:29.830 during the first half of the 20th century in PR.

465 00:26:29.830 --> 00:26:33.910 So this rapid industrialization project was,

466 00:26:33.910 --> 00:26:35.970 or program by the government was centered

467 00:26:35.970 --> 00:26:40.940 on incredibly generous corporate tax exemption policies

468 00:26:40.940 --> 00:26:43.270 at every level, right?

469 00:26:43.270 --> 00:26:46.720 It was at the Puerto Rico state level, municipal,

470 00:26:46.720 --> 00:26:48.120 just all kinds of tax breaks

471 00:26:49.704 --> 00:26:53.230 to entice foreign corporations,

472 00:26:53.230 --> 00:26:56.142 mostly US-based corporations, a lot of Canadian as well

473 00:26:56.142 --> 00:27:01.142 and European corporates interests coming in

474 00:27:01.600 --> 00:27:03.570 to invest in Puerto Rico.

475 00:27:03.570 --> 00:27:07.550 And that was also coupled by even federal tax exemptions,

476 00:27:07.550 --> 00:27:10.380 what was known as the IRS code section 936,

477 00:27:10.380 --> 00:27:12.590 although it had different iterations.

478 00:27:12.590 --> 00:27:17.420 But basically the idea was to attract these industries

479 00:27:17.420 --> 00:27:22.230 and have them create jobs locally and alleviate poverty

480 00:27:22.230 --> 00:27:23.180 but it didn't work.

481 00:27:24.580 --> 00:27:26.320 And so we still have currently

482 00:27:26.320 --> 00:27:31.320 about a 46% poverty rate and a very high unemployment rate.

483 00:27:33.270 --> 00:27:36.620 And in Salinas here in southeastern Puerto Rico,

484 00:27:36.620 --> 00:27:39.640 Salinas, Guayama, Arroyo, it's even higher.

485 00:27:39.640 --> 00:27:41.480 It's much higher.

486 00:27:41.480 --> 00:27:43.910 The median household income here is about one third

487 00:27:43.910 --> 00:27:46.500 that of the US, and yet we pay

488 00:27:46.500 --> 00:27:51.280 about the second or third highest electric rates

489 00:27:51.280 --> 00:27:53.023 of any US jurisdiction.

490 00:27:54.100 --> 00:27:56.980 And the government is heavily indebted.

491 00:27:56.980 --> 00:27:59.540 Has a huge debt, which you may know

492 00:27:59.540 --> 00:28:03.557 has led to a bankruptcy type case

493 00:28:05.010 --> 00:28:07.460 for the Puerto Rico government.

494 00:28:07.460 --> 00:28:09.780 And it's coupled with an emergency management

495 00:28:09.780 --> 00:28:12.730 and bankruptcy provisions.

496 00:28:12.730 --> 00:28:14.700 And there's been mass migration.

497 00:28:14.700 --> 00:28:16.810 About some 100,000 people,

498 00:28:16.810 --> 00:28:19.000 mostly working aged people.

499 00:28:19.000 --> 00:28:22.220 And lots of professionals, doctors.

500 00:28:22.220 --> 00:28:26.150 And so what we're seeing, especially in this region

501 00:28:26.150 --> 00:28:28.940 in southeastern Puerto Rico known as the Guayama region

502 00:28:28.940 --> 00:28:32.470 is even higher poverty rates and unemployment rates.

503 00:28:32.470 --> 00:28:35.060 Schools and hospital closings.

504 00:28:35.060 --> 00:28:38.615 And this is what we call...

505 00:28:38.615 --> 00:28:41.716 So then, sorry, the name of the statute is PROMESA,

506 00:28:41.716 --> 00:28:43.190 the Puerto Rico Oversight Management

507 00:28:43.190 --> 00:28:44.783 and Economic Stability Act.

508 00:28:46.660 --> 00:28:48.300 There's been no economic stability.

509 00:28:48.300 --> 00:28:51.080 It's just leading to poverty as the sign says.

510 00:28:51.080 --> 00:28:52.480 (speaking in foreign language)

511 00:28:52.480 --> 00:28:56.450 And so those statistics that I mentioned

512 00:28:56.450 --> 00:29:00.160 in terms of southeastern Puerto Rico are one part

513 00:29:00.160 --> 00:29:03.840 of the environmental justice problem here.

514 00:29:03.840 --> 00:29:06.450 The other part of the environmental justice problem here

515 00:29:06.450 --> 00:29:08.920 is that most of the...

516 00:29:08.920 --> 00:29:11.980 The two most contaminating power plants on the island

517 00:29:11.980 --> 00:29:15.140 are located in this region, in Guayama region

518 00:29:15.140 --> 00:29:17.130 here in southeastern Puerto Rico.

519 00:29:17.130 --> 00:29:18.330 And they are, as I mentioned,

520 00:29:18.330 --> 00:29:20.400 the AES coal-burning power plant,

521 00:29:20.400 --> 00:29:23.330 and the largest electrical complex in Puerto Rico,

522 00:29:23.330 --> 00:29:25.820 the Aguirre Power Complex.

523 00:29:25.820 --> 00:29:30.410 So they are one and two in terms of toxic emissions.

524 00:29:30.410 --> 00:29:32.170 And you'll see something else

525 00:29:32.170 --> 00:29:36.430 about AES in the coming slides.

526 00:29:36.430 --> 00:29:40.800 So obviously, coal combustion from the AES plant

527 00:29:42.040 --> 00:29:47.040 includes CO2 emissions, mercury, many other heavy metals.

528 00:29:49.870 --> 00:29:53.000 But in addition to that, people are also impacted.

529 00:29:53.000 --> 00:29:54.330 And very few people think

530 00:29:54.330 --> 00:29:57.290 about the energy water nexus,

531 00:29:57.290 --> 00:30:02.290 but it's very critical here because AES

532 00:30:02.810 --> 00:30:04.330 extracts water from what is known

533 00:30:04.330 --> 00:30:06.890 as the South Coast Aquifer.

534 00:30:06.890 --> 00:30:09.920 That South Coast Aquifer is the sole source

535 00:30:09.920 --> 00:30:12.453 of potable water for tens of thousands of people.

536 00:30:13.930 --> 00:30:18.453 And then in addition to that, AES discharges,

537 00:30:19.580 --> 00:30:22.080 for a while, it was supposed to be

538 00:30:22.080 --> 00:30:24.810 a zero water discharge facility

539 00:30:24.810 --> 00:30:26.940 but it was actually from the beginning

540 00:30:26.940 --> 00:30:30.433 illegally discharging contaminated water into the bay.

541 00:30:32.070 --> 00:30:35.540 And it also has contaminated the South Coast Aquifer,

542 00:30:35.540 --> 00:30:37.710 not only extracting water

543 00:30:37.710 --> 00:30:41.680 but also contaminating the water with coal ash waste

544 00:30:41.680 --> 00:30:45.380 or formerly known as coal combustion residuals.

545 00:30:45.380 --> 00:30:49.900 Because this plant, incredibly has no disposal facility

546 00:30:49.900 --> 00:30:53.180 for the millions of tons of coal ash waste

547 00:30:53.180 --> 00:30:55.750 that it generates or it has generated.

548 00:30:55.750 --> 00:30:57.840 It's about 300,000 a year.

549 00:30:57.840 --> 00:30:59.160 This is the slide.

550 00:30:59.160 --> 00:31:03.680 So if you look at this photograph on the left here,

551 00:31:03.680 --> 00:31:05.230 my left, I hope it's your left.

552 00:31:06.970 --> 00:31:08.460 This is coal ash waste.

553 00:31:08.460 --> 00:31:12.943 And as you can see, it's going into a storm water system.

554 00:31:14.320 --> 00:31:17.599 And that means, of course, that other water bodies

555 00:31:17.599 --> 00:31:20.620 will be contaminated with this coal ash waste.

556 00:31:20.620 --> 00:31:24.580 So coal ash waste or coal combustion residuals

557 00:31:24.580 --> 00:31:26.530 are basically a...

558 00:31:27.600 --> 00:31:30.550 What's left after burning coal.

559 00:31:30.550 --> 00:31:35.260 And because it's inorganic, are the heavy metals

560 00:31:35.260 --> 00:31:37.440 and the radioactive isotopes

561 00:31:37.440 --> 00:31:39.670 and that's what coal ash waste is.

562 00:31:39.670 --> 00:31:41.340 And by the way, this is a huge problem

563 00:31:41.340 --> 00:31:42.870 in the States as well.

564 00:31:42.870 --> 00:31:45.390 Because as you can see, about 100 million.

565 00:31:45.390 --> 00:31:47.730 That's even with the closure of all the coal plants,

566 00:31:47.730 --> 00:31:50.110 of many coal plants in the States

567 00:31:50.110 --> 00:31:52.120 there's still quite a few operating

568 00:31:52.120 --> 00:31:57.120 and they generate about 100 million tons of coal ash waste.

569 00:31:57.960 --> 00:32:02.920 Some of it is used, what they call as a beneficial product.

570 00:32:02.920 --> 00:32:07.300 And some of it is encapsulated in gypsum board.

571 00:32:07.300 --> 00:32:11.490 But a lot of it, most of it is either disposed

572 00:32:11.490 --> 00:32:14.570 in impoundments which leach the contaminants

573 00:32:14.570 --> 00:32:18.560 into other water bodies or at waste hills,

574 00:32:18.560 --> 00:32:22.210 which if not properly lined and managed can also leach.

575 00:32:22.210 --> 00:32:26.130 So that, as I said, that the AES plant here generates.

576 00:32:26.130 --> 00:32:29.120 And this is what it looks like.

577 00:32:29.120 --> 00:32:33.733 And this coal ash mountain was exposed,

578 00:32:34.980 --> 00:32:39.150 is constantly exposed to the hurricane winds

579 00:32:39.150 --> 00:32:41.630 or just regular Caribbean breeze.

580 00:32:41.630 --> 00:32:46.590 And also, especially after, during the hurricanes,

581 00:32:46.590 --> 00:32:48.763 it gets dispersed quite a bit.

582 00:32:50.030 --> 00:32:52.510 And so this is the sort of the detail

583 00:32:52.510 --> 00:32:55.010 of the kinds of things that we found

584 00:32:55.010 --> 00:32:57.320 in a test of the coal ash waste

585 00:32:57.320 --> 00:32:59.230 here on the AES coal ash.

586 00:32:59.230 --> 00:33:01.313 So you can see these are pretty hefty,

587 00:33:02.180 --> 00:33:03.910 heavy metals of concern.

588 00:33:03.910 --> 00:33:07.730 Arsenic, barium, boron, manganese, selenium, vanadium,

589 00:33:07.730 --> 00:33:11.630 among other elevated levels of metals and alpha particles.

590 00:33:11.630 --> 00:33:15.563 And so it is, it does include radioactive materials.

591 00:33:17.160 --> 00:33:22.160 And so the reason why this has been happening

592 00:33:23.150 --> 00:33:26.170 in the States for over a century and here in Puerto Rico

593 00:33:26.170 --> 00:33:28.160 since the AES plant opened up

594 00:33:28.160 --> 00:33:32.807 was because the test that was used

595 00:33:33.820 --> 00:33:38.350 to determine the leaching potential of coal ash waste,

596 00:33:38.350 --> 00:33:42.130 that is the ability to release these heavy metals

597 00:33:42.130 --> 00:33:46.580 into the environment, was for many years not the right test.

598 00:33:46.580 --> 00:33:50.300 And so this new test is, we were able to get

599 00:33:51.710 --> 00:33:55.210 the coal ash here tested with this new framework,

600 00:33:55.210 --> 00:33:59.440 which does determine the leaching capacities

601 00:33:59.440 --> 00:34:03.160 of this coal ash waste into groundwater surface,

602 00:34:03.160 --> 00:34:06.780 superficial water into the land.

603 00:34:06.780 --> 00:34:10.470 And so what happened as a result

604 00:34:10.470 --> 00:34:12.200 of all of these investigations

605 00:34:12.200 --> 00:34:14.330 is that we were able to get

606 00:34:14.330 --> 00:34:16.130 the University of Puerto Rico Graduate School

607 00:34:16.130 --> 00:34:20.470 of Public Health do two epidemiological studies.

608 00:34:20.470 --> 00:34:23.170 And they both basically confirm

609 00:34:23.170 --> 00:34:26.070 that the communities in Guayama closest

610 00:34:26.070 --> 00:34:30.670 to the AES coal plant have multiple times the incidence

611 00:34:30.670 --> 00:34:34.133 of respiratory disease, cardiovascular diseases,

612 00:34:35.470 --> 00:34:40.470 cancers obviously, and even spontaneous abortions,

613 00:34:40.670 --> 00:34:43.890 more so than the control community

614 00:34:43.890 --> 00:34:45.720 in northeast Puerto Rico,

615 00:34:45.720 --> 00:34:50.720 not impacted by the coal ash waste.

616 00:34:50.990 --> 00:34:55.990 And so, as I said, that the coal industry

617 00:34:56.550 --> 00:34:59.370 for a very long time has promoted

618 00:34:59.370 --> 00:35:00.910 the so-called beneficial use.

619 00:35:00.910 --> 00:35:05.130 They even call it, they give it these really cute names

620 00:35:05.130 --> 00:35:07.040 like Agremax here in Puerto Rico,

621 00:35:07.040 --> 00:35:11.170 and in Florida, I think it's called easy...

622 00:35:12.590 --> 00:35:14.170 I'm sorry, I forget what it is

623 00:35:14.170 --> 00:35:18.540 but the coal industry has really marketed

624 00:35:18.540 --> 00:35:20.240 its coal ash waste very well.

625 00:35:20.240 --> 00:35:23.660 But as you can see in the photograph,

626 00:35:23.660 --> 00:35:26.480 this is a housing development that was being built.

627 00:35:26.480 --> 00:35:29.100 I talk about sprawling housing construction here.

628 00:35:29.100 --> 00:35:31.790 Here is an example, but it was filled

629 00:35:31.790 --> 00:35:35.260 with coal ash waste, coal combustion residuals.

630 00:35:35.260 --> 00:35:36.930 And during the construction,

631 00:35:36.930 --> 00:35:40.460 all of the fuel treated dust was constantly in the air.

632 00:35:40.460 --> 00:35:43.810 And it was used primarily in flood prone areas

633 00:35:43.810 --> 00:35:47.230 above the sole-source aquifer in proximity to wetlands

634 00:35:47.230 --> 00:35:49.063 and ecologically sensitive areas.

635 00:35:50.240 --> 00:35:51.850 And also heavily populated areas

636 00:35:51.850 --> 00:35:53.190 because Puerto Rico is one

637 00:35:53.190 --> 00:35:56.003 of the most heavily populated places in the world.

638 00:35:57.550 --> 00:36:01.160 And this, by the way is also a very big problem in India,

639 00:36:01.160 --> 00:36:02.903 in many other places.

640 00:36:04.300 --> 00:36:07.660 So, it has led to unsustainable development

641 00:36:07.660 --> 00:36:12.660 and impacts to, for example, mangrove, canals, et cetera.

642 00:36:14.040 --> 00:36:16.870 And this, in the photograph you can see,

643 00:36:16.870 --> 00:36:19.660 this was a storm water retention pond

644 00:36:19.660 --> 00:36:21.920 built with coal ash waste.

645 00:36:21.920 --> 00:36:25.550 So obviously this leeches into the water.

646 00:36:25.550 --> 00:36:27.830 That connects with the groundwater

647 00:36:27.830 --> 00:36:30.873 and also discharges into a nearby river.

648 00:36:31.930 --> 00:36:36.930 So this is getting to be a very widespread problem.

649 00:36:41.070 --> 00:36:46.070 So we do now have a law to prohibit the use

650 00:36:49.600 --> 00:36:51.200 of the coal ash waste as film material

651 00:36:51.200 --> 00:36:53.063 and for these uses.

652 00:36:55.600 --> 00:36:58.430 But it is very much a race to the bottom phenomenon,

653 00:36:58.430 --> 00:37:01.680 where industries or jurisdictions

654 00:37:01.680 --> 00:37:05.760 both in the US and globally seek to attract low cost.

655 00:37:05.760 --> 00:37:08.023 And I put that, you know, within air quotes.

656 00:37:10.450 --> 00:37:14.780 Low cost, except the externalities are very high cost.

657 00:37:14.780 --> 00:37:17.250 And then, so this is a classic definition

658 00:37:17.250 --> 00:37:19.160 of environmental injustice

659 00:37:19.160 --> 00:37:23.290 that jurisdictions that have the ability to regulate

660 00:37:23.290 --> 00:37:25.670 do not exercise or do not implement

661 00:37:25.670 --> 00:37:27.430 those protective elements.

662 00:37:27.430 --> 00:37:32.028 There's lax enforcement and really insufficient resources

663 00:37:32.028 --> 00:37:33.570 on the part of the government

664 00:37:33.570 --> 00:37:36.980 to enforce any existing provisions.

665 00:37:36.980 --> 00:37:38.763 And so you see more and more of it.

666 00:37:39.730 --> 00:37:43.850 This is what we call environmental and racial injustice.

667 00:37:43.850 --> 00:37:46.200 That was actually in the photograph.

668 00:37:46.200 --> 00:37:51.200 A child playing among a pile of coal ash waste

669 00:37:51.790 --> 00:37:56.790 of heavy metals and radioactive materials.

670 00:37:58.150 --> 00:38:02.663 And so that coupled, this disproportionate impact

671 00:38:04.270 --> 00:38:05.770 and burden on people,

672 00:38:05.770 --> 00:38:09.840 coupled with the environmental justice criteria

673 00:38:09.840 --> 00:38:13.000 that include a higher than average

674 00:38:13.000 --> 00:38:14.810 or higher than the Puerto Rico average

675 00:38:14.810 --> 00:38:18.630 Afro-descendant community, closing of hospitals

676 00:38:20.658 --> 00:38:24.380 and the high poverty rates

677 00:38:24.380 --> 00:38:29.380 creates a situation where people are unjustly burdened.

678 00:38:32.430 --> 00:38:36.330 But as I said, the AES corporation

679 00:38:38.040 --> 00:38:40.410 actually marketed this coal ash

680 00:38:40.410 --> 00:38:42.770 and created a sham recycling operation

681 00:38:42.770 --> 00:38:46.493 till about, as I recall, 2012.

682 00:38:48.420 --> 00:38:52.400 And we are getting some kind of regulation now.

683 00:38:52.400 --> 00:38:55.860 As I mentioned, there is a law that was passed last year

684 00:38:55.860 --> 00:38:59.170 and we're awaiting a regulation to prohibit

685 00:38:59.170 --> 00:39:00.007 the use of the...

686 00:39:00.007 --> 00:39:02.853 The unencapsulated use of coal ash waste.

687 00:39:04.060 --> 00:39:05.970 And this is just citing authorities

688 00:39:05.970 --> 00:39:09.170 about how political bodies like municipal governments

689 00:39:09.170 --> 00:39:12.620 have what is known as the police power

690 00:39:12.620 --> 00:39:16.123 to safeguard the health and welfare of residents.

691 00:39:18.460 --> 00:39:23.217 And of course, there's this problem with federal preemption

692 00:39:24.250 --> 00:39:29.250 and which set of laws will actually apply.

693 00:39:29.690 --> 00:39:34.410 And in effect, although we've gotten about,

694 00:39:34.410 --> 00:39:38.040 I think it was about 15 municipal ordinances

695 00:39:38.040 --> 00:39:40.470 out of the 78 municipalities here in Puerto Rico

696 00:39:40.470 --> 00:39:45.470 had passed provisions to prevent the use of coal ash waste.

697 00:39:46.070 --> 00:39:49.570 Basically, that was preempted later on.

698 00:39:49.570 --> 00:39:53.090 But then we got the law passed that prohibits the use

699 00:39:53.090 --> 00:39:55.610 of the coal ash waste.

700 00:39:55.610 --> 00:39:56.443 And that's just

701 00:39:56.443 --> 00:39:58.740 like citing the Resource Conservation Recovery Act

702 00:39:58.740 --> 00:40:03.740 that the states within the federalism system,

703 00:40:06.190 --> 00:40:08.120 and Puerto Rico for that purpose

704 00:40:08.120 --> 00:40:12.370 is considered a state, are not prohibited

705 00:40:12.370 --> 00:40:15.300 from either the state or its political subdivisions.

706 00:40:15.300 --> 00:40:18.720 That is like the municipalities, counties, et cetera.

707 00:40:18.720 --> 00:40:21.670 from imposing stricter requirements

708 00:40:21.670 --> 00:40:25.390 on these kinds of operations,

709 00:40:25.390 --> 00:40:30.213 such as, including site selection and imposing regulations.

710 00:40:31.860 --> 00:40:36.320 But of course, the regulatory and litigation costs are high

711 00:40:36.320 --> 00:40:40.397 in order to achieve the kinds of provisions

712 00:40:42.650 --> 00:40:46.160 that are protective of human health and the environment.

713 00:40:46.160 --> 00:40:49.180 And so it puts the burden

714 00:40:49.180 --> 00:40:52.321 on environmental justice communities

715 00:40:52.321 --> 00:40:57.321 and state governments or local government entities.

716 00:40:59.770 --> 00:41:03.020 So now, I'm jumping over to the Dominican Republic

717 00:41:03.020 --> 00:41:04.950 just because I wanted to close the circle

718 00:41:04.950 --> 00:41:08.050 about how we saw in Colombia,

719 00:41:08.050 --> 00:41:10.180 the extraction process going on.

720 00:41:10.180 --> 00:41:15.180 Here in Puerto Rico, it's the combustion of the coal

721 00:41:15.830 --> 00:41:17.180 that creates a coal ash waste

722 00:41:17.180 --> 00:41:20.393 and all of the emissions and water contamination, et cetera.

723 00:41:21.250 --> 00:41:24.317 What happened with the coal ash waste in Puerto Rico

724 00:41:24.317 --> 00:41:27.193 was that it was taken to the Dominican Republic,

725 00:41:28.570 --> 00:41:30.270 to a place called Arroyo Barril

726 00:41:32.182 --> 00:41:36.930 and people were told that they could use this

727 00:41:36.930 --> 00:41:40.380 as film material, or they can use this

728 00:41:40.380 --> 00:41:43.790 as construction material within their own homes.

729 00:41:43.790 --> 00:41:45.730 And apparently did so.

730 00:41:45.730 --> 00:41:50.620 And suddenly, children were born with defects.

731 00:41:50.620 --> 00:41:55.620 As you can see in the photo, the child is missing his arms.

732 00:41:56.010 --> 00:41:58.300 And there were quite a few cases

733 00:41:58.300 --> 00:42:02.160 that were brought and ultimately settled by AES.

734 00:42:02.160 --> 00:42:04.310 This is the first settlement agreement

735 00:42:04.310 --> 00:42:09.310 when AES was sued by the government of Dominican Republic.

736 00:42:11.930 --> 00:42:14.930 And then let's go to another island in the Caribbean

737 00:42:14.930 --> 00:42:19.140 that is trying to move away from fossil fuel generation.

738 00:42:19.140 --> 00:42:21.750 And I really liked what...

739 00:42:21.750 --> 00:42:25.640 This was a conference I attended on the climate crisis.

740 00:42:25.640 --> 00:42:29.543 And the message that they were transmitting

741 00:42:34.200 --> 00:42:38.470 is that the key to success was that energy prices

742 00:42:38.470 --> 00:42:40.600 in the US Virgin Islands were high,

743 00:42:40.600 --> 00:42:43.420 but they are no higher than what energy prices should be

744 00:42:43.420 --> 00:42:46.880 if the external costs of burning fossil fuel,

745 00:42:46.880 --> 00:42:48.840 pollution, climate change, and it should say,

746 00:42:48.840 --> 00:42:52.623 health impacts are considered.

747 00:42:54.030 --> 00:42:56.030 Okay, so this is...

748 00:42:56.030 --> 00:42:58.670 Well, I think this is my next to last slide.

749 00:42:58.670 --> 00:43:02.410 This was a symbolic protest that was held here

750 00:43:02.410 --> 00:43:05.480 in Puerto Rico after hurricane Maria.

751 00:43:05.480 --> 00:43:08.820 The shoes represent people who passed away

752 00:43:08.820 --> 00:43:11.340 as a result of the hurricane

753 00:43:11.340 --> 00:43:16.340 and to a large extent of not having electric power.

754 00:43:16.460 --> 00:43:18.810 And that number is disputed

755 00:43:18.810 --> 00:43:22.993 but it's anywhere between about 3000, 5000 people that died.

756 00:43:24.310 --> 00:43:29.310 And so this in the map here on top shows Puerto Rico

757 00:43:29.640 --> 00:43:32.663 prior and after the hurricane.

758 00:43:33.590 --> 00:43:37.570 And so, I wanna emphasize

759 00:43:37.570 --> 00:43:41.380 that when we talk about the transformation

760 00:43:41.380 --> 00:43:43.100 that's needed here in Puerto Rico,

761 00:43:43.100 --> 00:43:46.210 it's not just about not burning fossil fuels.

762 00:43:46.210 --> 00:43:51.120 It's also about not transmitting energy long distances

763 00:43:51.120 --> 00:43:54.620 because as we said, these transmission systems

764 00:43:54.620 --> 00:43:58.250 and distribution systems are vulnerable and can,

765 00:43:58.250 --> 00:44:00.470 even with renewable energy projects being,

766 00:44:00.470 --> 00:44:02.710 say, down here in Southern Puerto Rico,

767 00:44:02.710 --> 00:44:04.300 they need to be transmitted.

768 00:44:04.300 --> 00:44:07.550 And so that's why we talk about onsite and rooftop solar

769 00:44:07.550 --> 00:44:10.680 as being a better solution.

770 00:44:10.680 --> 00:44:14.520 And because these transmission systems lose energy

771 00:44:14.520 --> 00:44:18.080 on the way, and also are very expensive

772 00:44:18.080 --> 00:44:21.450 and represent sort of an opportunity cost

773 00:44:21.450 --> 00:44:26.450 against actually onsite energy generation,

774 00:44:28.550 --> 00:44:31.780 which by definition has to be cleaner

775 00:44:31.780 --> 00:44:33.893 so as not to impact public health.

776 00:44:35.200 --> 00:44:40.200 And so that I think is the issue.

777 00:44:40.240 --> 00:44:42.810 Should we be rebuilding with the existing

778 00:44:42.810 --> 00:44:45.490 centralized fossil fuel system?

779 00:44:45.490 --> 00:44:49.970 Or can we convince FEMA, HUD and the federal government

780 00:44:49.970 --> 00:44:53.850 to allow for onsite generation.

781 00:44:53.850 --> 00:44:55.450 Rooftop solar primarily coupled

782 00:44:55.450 --> 00:44:58.150 with battery energy storage systems

783 00:44:58.150 --> 00:45:02.760 and thereby protect public health here.

784 00:45:02.760 --> 00:45:06.740 And that I think is all.

785 00:45:06.740 --> 00:45:10.483 And if you have any questions, please feel free.

786 00:45:12.290 --> 00:45:13.270 - Thanks, Ruth.

787 00:45:13.270 --> 00:45:15.350 This is very wonderful presentation.

788 00:45:15.350 --> 00:45:19.020 And you talk about the environmental and racial justice

789 00:45:19.020 --> 00:45:20.850 not just within Puerto Rico

790 00:45:20.850 --> 00:45:25.130 but also in the frontline communities in Colombia

791 00:45:25.130 --> 00:45:27.990 and also in the Dominican Republic.

792 00:45:27.990 --> 00:45:30.920 So a lot of powerful messages here.

793 00:45:30.920 --> 00:45:35.120 I do have a lot of questions students already submitted.

794 00:45:35.120 --> 00:45:38.550 And for all the audiences, if you have questions,

795 00:45:38.550 --> 00:45:42.410 please type in your questions in the chat box.

796 00:45:42.410 --> 00:45:47.410 So Ruth, you mentioned about the coal ash waste

797 00:45:47.630 --> 00:45:52.160 and how it could be, you know, during the hurricane,

798 00:45:52.160 --> 00:45:55.800 during the big storms, the ashes can flood into the water

799 00:45:56.710 --> 00:45:59.250 and this makes no doubt

800 00:45:59.250 --> 00:46:02.870 that the coal ash waste are very vulnerable

801 00:46:02.870 --> 00:46:05.680 to this climate disaster.

802 00:46:05.680 --> 00:46:07.450 For the students that are actually wondering,

803 00:46:07.450 --> 00:46:09.950 a lot this clean energy options

804 00:46:09.950 --> 00:46:14.130 like the solar, roof solar energy projects.

805 00:46:14.130 --> 00:46:16.110 Have you considered

806 00:46:16.110 --> 00:46:19.710 how that this new renewable energy system,

807 00:46:19.710 --> 00:46:23.800 the resistance to the climate disasters

808 00:46:23.800 --> 00:46:25.573 in particular, the hurricanes?

809 00:46:26.630 --> 00:46:30.380 - Okay, well, if I'm understanding correctly,

810 00:46:30.380 --> 00:46:34.210 so, are you saying how resistant

811 00:46:34.210 --> 00:46:37.940 are rooftop solar installations to the climate,

812 00:46:37.940 --> 00:46:39.810 to the increased hurricanes?

813 00:46:39.810 --> 00:46:43.997 Well, what we found is that they do pretty well because...

814 00:46:46.460 --> 00:46:49.090 I don't have official data, but it's between

815 00:46:49.090 --> 00:46:52.580 five and 10% of the panels were impacted by the hurricane

816 00:46:52.580 --> 00:46:56.053 as opposed to 80% of the transmission system.

817 00:46:57.230 --> 00:47:00.500 And the interesting thing about panels.

818 00:47:00.500 --> 00:47:05.500 One, is they can be hardened to withstand very strong winds.

819 00:47:05.820 --> 00:47:08.480 Second, because of the latitude where we are,

820 00:47:08.480 --> 00:47:11.100 especially here in Puerto Rico, they're almost flat.

821 00:47:11.100 --> 00:47:13.640 They don't need that 45 angles,

822 00:47:13.640 --> 00:47:17.420 as, you know, further a jurisdiction further in the north.

823 00:47:17.420 --> 00:47:21.570 And third, people here even have contests

824 00:47:21.570 --> 00:47:25.673 to take down their panels and see how fast they can do it.

825 00:47:26.600 --> 00:47:30.970 So I've heard 20 minutes for a very smaller rate.

826 00:47:30.970 --> 00:47:33.550 We also promote very smaller rates for critical needs

827 00:47:33.550 --> 00:47:38.550 within the household, like four to six panels and batteries.

828 00:47:38.570 --> 00:47:40.890 And so they can be taken down as well.

829 00:47:40.890 --> 00:47:42.780 So there are many options.

830 00:47:42.780 --> 00:47:47.780 And like I said, even what we saw is that solar farms

831 00:47:50.830 --> 00:47:54.390 and wind farms did not hold up during the hurricane

832 00:47:54.390 --> 00:47:57.250 as well as the panels on rooftops.

833 00:47:57.250 --> 00:47:58.780 For example, there was a wind farm

834 00:47:58.780 --> 00:48:01.480 on the eastern coast of Puerto Rico, which no longer exists.

835 00:48:01.480 --> 00:48:03.570 It was called Punta Lima.

836 00:48:03.570 --> 00:48:06.600 The hurricane took it away.

837 00:48:06.600 --> 00:48:09.410 And the panels on the east coast there

838 00:48:09.410 --> 00:48:14.410 that were on a wind farm also would severely damaged.

839 00:48:15.930 --> 00:48:18.243 But yeah, the rooftop holds up pretty well.

840 00:48:19.672 --> 00:48:21.540 - I think, yeah, that's very promising

841 00:48:21.540 --> 00:48:23.193 and very interesting.

842 00:48:24.661 --> 00:48:28.790 That is great news to the transition.

843 00:48:28.790 --> 00:48:32.370 This second question the students are kind of wondering

844 00:48:32.370 --> 00:48:35.250 is regarding the renewable energy.

845 00:48:35.250 --> 00:48:38.050 Here, we're mostly talking about the solar energy,

846 00:48:38.050 --> 00:48:41.240 but have you, could you give us more information

847 00:48:41.240 --> 00:48:44.250 regarding other types of renewable energy

848 00:48:44.250 --> 00:48:49.250 like the tide power or other, like offshore wind power?

849 00:48:52.870 --> 00:48:53.870 - Right. Yeah.

850 00:48:53.870 --> 00:48:57.230 We've discussed that a lot of those other options.

851 00:48:57.230 --> 00:49:00.500 Offshore wind largely has the problem with the hurricanes.

852 00:49:00.500 --> 00:49:05.500 I think jurisdictions that are prone to hurricanes

853 00:49:05.650 --> 00:49:10.650 would be probably better served by systems

854 00:49:12.860 --> 00:49:17.290 that don't don't have these vertical structures

855 00:49:17.290 --> 00:49:21.090 because they are impacted by hurricanes.

856 00:49:21.090 --> 00:49:24.700 And as you know, even the hurricanes now

857 00:49:24.700 --> 00:49:29.700 are even reaching the northeast US.

858 00:49:29.930 --> 00:49:34.930 So I don't know how well offshore wind

859 00:49:35.020 --> 00:49:36.470 is gonna hold up to that.

860 00:49:36.470 --> 00:49:38.010 That remains to be seen.

861 00:49:38.010 --> 00:49:39.340 That on the one hand.

862 00:49:39.340 --> 00:49:41.950 In terms of tidal energy,

863 00:49:41.950 --> 00:49:43.710 there's an experiment going on right now

864 00:49:43.710 --> 00:49:46.720 in southeastern Puerto Rico offshore.

865 00:49:46.720 --> 00:49:49.680 I don't know too much about it, but I am concerned

866 00:49:49.680 --> 00:49:53.560 and I think those of us who are in the environmental field

867 00:49:53.560 --> 00:49:56.403 are concerned about impacts to the water column,

868 00:49:57.300 --> 00:50:00.300 because a lot of the reproduction

869 00:50:00.300 --> 00:50:05.220 of marine species like egg larvae,

870 00:50:05.220 --> 00:50:09.450 and egg and fish larvae and eggs can,

871 00:50:09.450 --> 00:50:14.450 I think be impacted by a manipulation of the water

872 00:50:14.720 --> 00:50:19.720 from the shallow, sorry, the bottom part of the ocean

873 00:50:19.790 --> 00:50:20.623 to the top.

874 00:50:20.623 --> 00:50:23.120 And I think that's how basically it works.

875 00:50:23.120 --> 00:50:26.810 So I think that might create some unexpected impacts

876 00:50:26.810 --> 00:50:28.453 in the marine environment.

877 00:50:30.480 --> 00:50:33.790 So that also to me is a question mark.

878 00:50:33.790 --> 00:50:34.623 - Ruth, thanks.

879 00:50:34.623 --> 00:50:37.260 Yes, we do need to consider not just human health

880 00:50:37.260 --> 00:50:40.793 but also like the coastal environmental ecosystems.

881 00:50:41.640 --> 00:50:45.750 So another question from the audience is,

882 00:50:45.750 --> 00:50:49.570 the first one is from Maggie asking.

883 00:50:49.570 --> 00:50:53.090 I was going to ask how much interconnectivity

884 00:50:53.090 --> 00:50:57.520 there is in support of Puerto Rico's advocacy

885 00:50:57.520 --> 00:51:00.150 as part of global advocacy.

886 00:51:00.150 --> 00:51:05.150 I'm not sure it's a question or just a comment.

887 00:51:07.460 --> 00:51:08.630 - Okay.

888 00:51:08.630 --> 00:51:11.580 Well, in terms of this, for example,

889 00:51:11.580 --> 00:51:14.630 the work that we've done on coal,

890 00:51:14.630 --> 00:51:19.630 anti-coal combustion and especially coal ash waste work,

891 00:51:20.480 --> 00:51:23.103 it is almost on a global scale.

892 00:51:23.970 --> 00:51:27.640 We have been working with groups throughout the US.

893 00:51:27.640 --> 00:51:32.640 We were actually part of a listserv throughout the US.

894 00:51:34.100 --> 00:51:37.090 I think there are people from other countries as well,

895 00:51:37.090 --> 00:51:40.220 and we've done, had some connections, as I said,

896 00:51:40.220 --> 00:51:45.220 with the Dominican Republic, Colombia, Virgin islands,

897 00:51:45.310 --> 00:51:47.850 here in the Caribbean basin area,

898 00:51:47.850 --> 00:51:52.850 and some experiences in other countries as well,

899 00:51:53.840 --> 00:51:57.560 on especially the coal ash waste issue.

900 00:51:57.560 --> 00:51:58.830 It's a huge problem.

901 00:51:58.830 --> 00:52:03.630 It's like the asbestos of our time

902 00:52:05.320 --> 00:52:07.450 in terms of the implications that it has

903 00:52:08.320 --> 00:52:12.850 for dispersing into air, water, land

904 00:52:13.700 --> 00:52:15.433 and affecting public health.

905 00:52:16.640 --> 00:52:18.210 In terms of renewable energy,

906 00:52:18.210 --> 00:52:21.850 also, we're linked with groups throughout the States

907 00:52:25.520 --> 00:52:30.520 and a little bit now with groups in the Dominican Republic.

908 00:52:30.730 --> 00:52:32.268 Yeah.

909 00:52:32.268 --> 00:52:33.440 - Yeah. So, yeah.

910 00:52:33.440 --> 00:52:35.910 Since we're talking about like the kind of connection

911 00:52:35.910 --> 00:52:39.720 with the mainland, there's one question from the students.

912 00:52:39.720 --> 00:52:41.560 Is particular interested about,

913 00:52:41.560 --> 00:52:44.490 after the major storms, Hurricane Maria,

914 00:52:44.490 --> 00:52:48.420 lots of interests from the mainland paid to Puerto Rico

915 00:52:48.420 --> 00:52:51.250 and especially after the Green New Deal.

916 00:52:51.250 --> 00:52:54.710 So do you feel that there are more positives

917 00:52:54.710 --> 00:52:58.410 that come out of this increased attention

918 00:52:58.410 --> 00:53:01.290 from the mainland, the politicians and the public

919 00:53:01.290 --> 00:53:02.653 or the other way?

920 00:53:04.540 --> 00:53:05.720 - Okay.

921 00:53:05.720 --> 00:53:06.553 Certainly.

922 00:53:06.553 --> 00:53:09.030 Puerto Rico after Hurricane Maria

923 00:53:10.740 --> 00:53:13.810 became a better known place.

924 00:53:13.810 --> 00:53:18.520 I've often been to places where...

925 00:53:18.520 --> 00:53:20.360 And that's why I put the map on my slide there

926 00:53:20.360 --> 00:53:23.500 because I've been to places where people don't really know

927 00:53:23.500 --> 00:53:26.080 what or where Puerto Rico is.

928 00:53:26.080 --> 00:53:30.650 People in the States often, especially before the hurricane,

929 00:53:30.650 --> 00:53:34.070 did not know that Puerto Rico was part of the United States.

930 00:53:34.070 --> 00:53:36.023 That happened to me quite a lot.

931 00:53:37.230 --> 00:53:38.063 Yes.

932 00:53:38.063 --> 00:53:40.223 So this attention, this renewed attention,

933 00:53:41.160 --> 00:53:43.570 I think is largely positive.

934 00:53:43.570 --> 00:53:46.520 I think people have good faith in the States

935 00:53:46.520 --> 00:53:49.620 and the Puerto Rican diaspora were life savers

936 00:53:49.620 --> 00:53:53.550 after the hurricane because the government did not respond.

937 00:53:53.550 --> 00:53:58.020 And people, we were in touch with so many people

938 00:53:58.020 --> 00:53:59.880 and groups throughout the States

939 00:53:59.880 --> 00:54:01.890 that were trying to help the situation

940 00:54:01.890 --> 00:54:04.790 and in the solar energy field,

941 00:54:04.790 --> 00:54:09.260 not just in terms of providing, first being,

942 00:54:09.260 --> 00:54:14.260 the first provision of food and clean water and et cetera

943 00:54:14.330 --> 00:54:19.330 but also bringing in more and more of the solar technology.

944 00:54:19.540 --> 00:54:22.090 So, I think it's definitely positive.

945 00:54:22.090 --> 00:54:25.400 Now, I should say, there's this one negative part about it.

946 00:54:25.400 --> 00:54:29.040 And it was the natural gas industry.

947 00:54:29.040 --> 00:54:33.270 The LNG industry also came in right after the hurricane.

948 00:54:33.270 --> 00:54:36.350 And you saw that Siemens Industry map

949 00:54:36.350 --> 00:54:39.950 talking about building all of this LNG infrastructure

950 00:54:39.950 --> 00:54:40.930 on the island.

951 00:54:40.930 --> 00:54:44.770 And there has been, there is sort of a battle going on

952 00:54:44.770 --> 00:54:47.260 for the electric system here,

953 00:54:47.260 --> 00:54:51.250 to rebuild it either as it was with so-called hardening

954 00:54:51.250 --> 00:54:55.230 and undergrounding versus what we are proposing

955 00:54:55.230 --> 00:54:59.070 in Queremos Sol, which is a civil society,

956 00:54:59.070 --> 00:55:03.573 prosumer oriented, energy democracy focus.

957 00:55:04.830 --> 00:55:05.880 - Ruth, thanks, yeah.

958 00:55:05.880 --> 00:55:10.880 I think regarding the gas energy alternative

959 00:55:11.250 --> 00:55:13.970 on the fracking way is another heated topic,

960 00:55:13.970 --> 00:55:18.090 which hopefully will help some other speakers

961 00:55:18.090 --> 00:55:19.540 cover this in the future.

962 00:55:19.540 --> 00:55:22.130 But I do have another question from the audience,

963 00:55:22.130 --> 00:55:23.130 from Kyle Wyche.

964 00:55:23.130 --> 00:55:26.373 So, Kyle, do you want to ask yourself.

965 00:55:29.380 --> 00:55:31.750 - Sure, I'm happy to ask.

966 00:55:31.750 --> 00:55:33.210 I was kinda curious.

967 00:55:33.210 --> 00:55:35.330 We talked a lot about solar energy

968 00:55:35.330 --> 00:55:37.660 and that being a perfect renewable energy,

969 00:55:37.660 --> 00:55:38.810 but I'm also curious,

970 00:55:38.810 --> 00:55:41.320 what happens to the local food waste in Puerto Rico?

971 00:55:41.320 --> 00:55:42.950 And if that is being reused,

972 00:55:42.950 --> 00:55:45.300 if it's going to compost, anything like that.

973 00:55:45.300 --> 00:55:47.530 I'm particularly interested in turning food waste

974 00:55:47.530 --> 00:55:49.850 into renewable energy, and then also

975 00:55:49.850 --> 00:55:52.040 a nutrient dense liquid plant fertilizers

976 00:55:52.040 --> 00:55:54.700 that can be used again for crops or hydroponics

977 00:55:54.700 --> 00:55:57.310 instead of creating new land for agriculture

978 00:55:57.310 --> 00:55:58.313 and things like that.

979 00:55:59.400 --> 00:56:01.300 - Okay, thanks for the question, Kyle.

980 00:56:02.180 --> 00:56:05.620 Yeah, we have a huge problem here with our landfills.

981 00:56:05.620 --> 00:56:08.230 The first environmental case I ever worked on

982 00:56:09.700 --> 00:56:13.340 back in the '90s was what would have been

983 00:56:13.340 --> 00:56:14.950 the largest landfill here.

984 00:56:14.950 --> 00:56:17.780 It was again over the South Coast Aquifer.

985 00:56:17.780 --> 00:56:21.280 So we were totally against creating a big hole

986 00:56:21.280 --> 00:56:26.280 in the earth to potentially contaminate the water supply.

987 00:56:26.580 --> 00:56:31.580 And we worked for many years at Comite Dialogo Ambiental

988 00:56:32.394 --> 00:56:33.833 and many, many other groups.

989 00:56:35.153 --> 00:56:40.153 I have worked for the reduction, reuse or recycling programs

990 00:56:42.500 --> 00:56:44.890 and composting, of course.

991 00:56:44.890 --> 00:56:47.700 It has not been successful at all.

992 00:56:47.700 --> 00:56:50.840 I have to say in all honesty that we have a law

993 00:56:50.840 --> 00:56:55.733 with very ambitious goals that have not been achieved.

994 00:56:56.870 --> 00:56:57.803 It's a fiasco.

995 00:56:59.495 --> 00:57:04.495 There've been numerous waste energy projects proposed here

996 00:57:04.610 --> 00:57:09.610 that basically involve some kind of some incineration

997 00:57:09.750 --> 00:57:13.270 or paralysis of those materials,

998 00:57:13.270 --> 00:57:17.640 that have been not acceptable to civil society groups.

999 00:57:17.640 --> 00:57:20.550 In fact, one of the co-founding groups

1000 00:57:20.550 --> 00:57:24.980 of Queremos Sol, it's called, Coalicion Anti-Incineracion,

1001 00:57:24.980 --> 00:57:27.160 anti-incineration coalition.

1002 00:57:27.160 --> 00:57:32.160 They have been very active in fighting that sort of thing.

1003 00:57:32.980 --> 00:57:37.640 I don't know enough about the technologies

1004 00:57:37.640 --> 00:57:40.520 for waste management or...

1005 00:57:43.080 --> 00:57:44.043 Yeah.

1006 00:57:49.667 --> 00:57:51.413 Bio energy programs.

1007 00:57:51.413 --> 00:57:54.450 I confess, I don't know enough about those.

1008 00:57:54.450 --> 00:57:57.660 In fact, I wanna say something interesting though.

1009 00:57:57.660 --> 00:58:00.330 On Thursday, I think it is,

1010 00:58:00.330 --> 00:58:04.080 Yale is having a conference

1011 00:58:04.080 --> 00:58:08.670 or we're having this little symposium or discussion

1012 00:58:08.670 --> 00:58:13.640 between groups from Puerto Rico and Cuba.

1013 00:58:13.640 --> 00:58:17.590 And in the materials that the Cuban contingent sent,

1014 00:58:17.590 --> 00:58:22.590 they apparently do a lot of that composting and biofuels

1015 00:58:24.190 --> 00:58:26.230 but I don't know.

1016 00:58:26.230 --> 00:58:29.733 I'm gonna learn, so sorry about that.

1017 00:58:31.400 --> 00:58:32.233 - Thanks, Ruth.

1018 00:58:32.233 --> 00:58:34.170 I think we are almost on time

1019 00:58:34.170 --> 00:58:37.410 and I do have one final question from the audience

1020 00:58:37.410 --> 00:58:42.210 is regarding other system of renewable energy,

1021 00:58:42.210 --> 00:58:44.020 you're talking about these projects.

1022 00:58:44.020 --> 00:58:45.480 Are they facing oppositions

1023 00:58:45.480 --> 00:58:47.660 from the coal plants in Puerto Rico?

1024 00:58:47.660 --> 00:58:51.530 What about the political atmosphere there?

1025 00:58:51.530 --> 00:58:54.860 Obviously, students are also kind of wondering this.

1026 00:58:54.860 --> 00:58:55.870 - Oh yeah.

1027 00:58:55.870 --> 00:58:56.703 Okay.

1028 00:58:56.703 --> 00:59:00.660 So, the coal plant issue is, right now,

1029 00:59:00.660 --> 00:59:05.660 it's the the most known, well-known environmental issue

1030 00:59:08.370 --> 00:59:10.280 and problem in Puerto Rico.

1031 00:59:10.280 --> 00:59:12.500 And there've been massive mobilizations

1032 00:59:12.500 --> 00:59:14.970 and all kinds of laws and regulations

1033 00:59:14.970 --> 00:59:18.460 and just everything possible that fortunately

1034 00:59:18.460 --> 00:59:22.930 all of Puerto Rico has basically joined in this fight.

1035 00:59:22.930 --> 00:59:25.430 And so there's a law that require,

1036 00:59:25.430 --> 00:59:27.210 and in the IRP, in fact,

1037 00:59:27.210 --> 00:59:29.150 the Integrated Resource Plan that I mentioned

1038 00:59:29.150 --> 00:59:30.420 that we were a part of,

1039 00:59:30.420 --> 00:59:33.520 it states that the coal burning power plant

1040 00:59:33.520 --> 00:59:35.610 has to shut down by 2027,

1041 00:59:35.610 --> 00:59:37.810 because that's when the power purchase

1042 00:59:37.810 --> 00:59:40.200 and operation agreement ends.

1043 00:59:40.200 --> 00:59:43.303 And actually the groups want to shut it down before then.

1044 00:59:44.440 --> 00:59:49.440 So there has been quite a lot of opposition to the coal.

1045 00:59:52.020 --> 00:59:54.500 And what we're saying is that instead,

1046 00:59:54.500 --> 00:59:59.180 we can use massive rooftop solar installation

1047 00:59:59.180 --> 01:00:02.893 to substitute that plant and other plants as well.

1048 01:00:04.200 --> 01:00:07.220 And we are seeing, for example,

1049 01:00:07.220 --> 01:00:10.750 there is also an ongoing privatization process

1050 01:00:10.750 --> 01:00:12.960 of the Puerto Rico Electric Power Authority.

1051 01:00:12.960 --> 01:00:15.740 And the company is a conglomerate

1052 01:00:15.740 --> 01:00:19.160 between Quanta Services and ATCO which,

1053 01:00:19.160 --> 01:00:22.660 one is a US and one is a Canadian company

1054 01:00:22.660 --> 01:00:25.550 that put together something called Luma Energy

1055 01:00:25.550 --> 01:00:28.067 in order to operate the transmission

1056 01:00:28.067 --> 01:00:29.930 and distribution system here.

1057 01:00:29.930 --> 01:00:33.020 And they are very much against onsite solar,

1058 01:00:33.020 --> 01:00:35.250 because their business is to keep

1059 01:00:35.250 --> 01:00:37.350 those long distance transmission

1060 01:00:37.350 --> 01:00:39.320 and distribution lines going

1061 01:00:39.320 --> 01:00:41.930 and take all those federal funds to do...

1062 01:00:41.930 --> 01:00:45.080 I call it trickle down energy.

1063 01:00:45.080 --> 01:00:49.340 When you do long distance transmission distribution,

1064 01:00:49.340 --> 01:00:53.330 you're doing indirectly what you can do more efficiently

1065 01:00:53.330 --> 01:00:57.220 with onsite generation, rooftop solar.

1066 01:00:57.220 --> 01:01:00.210 And, but so yes, we're seeing resistance

1067 01:01:00.210 --> 01:01:05.180 from the big gas and oil and Siemens Industry

1068 01:01:05.180 --> 01:01:10.040 that sells big combined cycle generators

1069 01:01:10.040 --> 01:01:15.040 and Luma Energy and just the usual fossil fuel

1070 01:01:15.180 --> 01:01:18.483 and centralized generation companies.

1071 01:01:19.450 --> 01:01:21.660 - Yeah, thank you for sharing this perspective.

1072 01:01:21.660 --> 01:01:25.070 So with that, I think we can end today's seminar.

1073 01:01:25.070 --> 01:01:27.230 So once again, thank you, Ruth

1074 01:01:27.230 --> 01:01:29.970 for giving this excellent presentation.

1075 01:01:29.970 --> 01:01:31.430 Very much appreciate.

1076 01:01:31.430 --> 01:01:34.630 And thank you all for coming on this thing at the end.

1077 01:01:34.630 --> 01:01:35.693 - My pleasure.