# Planet of the Humans: Annotated

## Written, Directed, Produced, Narrated by Jeff Gibbs

### Premiered July 2019 at Traverse City Film Festival and largely ignored. Michael Moore puts it on YouTube for Earth Day 2020, free for 30 days, and....

### From [YouTube page](https://www.youtube.com/watch?v=Zk11vI-7czE):

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| 6,110,951 views on YouTube, Apr 21, 2020 to May 4, 2020 at 0930Michael Moore presents Planet of the Humans, a documentary that dares to say what no one else will this Earth Day — that we are losing the battle to stop climate change on planet earth because we are following leaders who have taken us down the wrong road — selling out the green movement to wealthy interests and corporate America. This film is the wake-up call to the reality we are afraid to face: that in the midst of a human-caused extinction event, the environmental movement’s answer is to push for techno-fixes and band-aids. It's too little, too late. [Interview with Jeff, Michael, and Ozzie](https://youtu.be/HBGcEK8FD3w) (1hr 16min)[Hill TV Response to critics with Jeff, Michael and Ozzie](https://youtu.be/Bop8x24G_o0) (17min)[FAQ](https://planetofthehumans.com/), Discussion Guide, MediaRemoved from the debate is the only thing that MIGHT save us: getting a grip on our out-of-control human presence and consumption. Why is this not THE issue? Because that would be bad for profits, bad for business. Have we environmentalists fallen for illusions, “green” illusions, that are anything but green, because we’re scared that this is the end—and we’ve pinned all our hopes on biomass, wind turbines, and electric cars? No amount of batteries are going to save us, warns director Jeff Gibbs (lifelong environmentalist and co-producer of “Fahrenheit 9/11” and “Bowling for Columbine"). This urgent, must-see movie, a full-frontal assault on our sacred cows, is guaranteed to generate anger, debate, and, hopefully, a willingness to see our survival in a new way—before it’s too late.Featuring: Al Gore, Bill McKibben, Richard Branson, Robert F Kennedy Jr., Michael Bloomberg, Van Jones, Vinod Khosla, Koch Brothers, Vandana Shiva, General Motors, 350.org, Arnold Schwarzenegger, Sierra Club, the Union of Concerned Scientists, Nature Conservancy, Elon Musk, Tesla. [and Robert Heinberg, Richard York, Nina Jablonski, Michael Brune, Steven Running, Steven Churchill, Sheldon Solomon]Website: <https://planetofthehumans.com/>51,386 Comments on YouTube |

### For more fair and balanced, Wikipedia now (5/3/2020) [has an article](https://en.wikipedia.org/wiki/Planet_of_the_Humans) with 29 references, 28 from after Earth Day 2020 when the film could no longer be ignored:

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| Per Wikipedia:Jeff Gibbs has said that the film is designed to prompt discussion and debate beyond the narrow issue of climate change and look at the overall human impact on the environment, including issues such as the contemporary extinction crisis in which half of all wildlife has disappeared in the last 40 years, and whether green technology can solve these issues. |

So, to add to the discussion, some concerned global citizens who think they know enough to have an opinion have annotated the film. Those who would rather know than believe, who want to help their fellow citizens of Spaceship Earth know and understand the world better, offer their comments, notes, and links for further consideration. Concerned citizens will be interested in what they have to offer:

Initials indicate source of comments, notes, and links to more information:

AN: Anne Nonomus
ED: Editor
JD: John Q. Doe

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| Transcript, from YouTube  | Comments/Notes/Links   |
| 00:03 (Intense electronic music, then haunting music.) |   |
| 00:21 - [Jeff Gibbs] I've got a question. How long do you think we humans have?  | For some reason, Jeff seems to have [existential concerns](http://www.sustainable.soltechdesigns.com/index.html) for humanity and the biosphere. [JD] |
| 00:26 - How long does the human race have?  | Various humans give answers. [ED]  |
| 00:28 - Ooh.  |  |
| 00:29 - Um. |   |
| 00:31 - Oh, wow. |   |
| 00:32 - I don't exactly know, but might be soon. |  |
| 00:34 - I have no clue. |   |
| 00:36 - [Jeff] No? (laughing) | Correct answer is 'I don't know and you don't either'. Nature doesn't care what I think, so I'd rather know what Nature 'thinks'. [JD] |
| 00:36 - I hope I get me at least 50 more years. (laughing) |   |
| 00:38 - I think there's infinite amount of time. |   |
| 00:41 - Infinite. |   |
| 00:42 It's infinite, yeah. |   |
| 00:44 - I give us a million. A million years. |   |
| 00:46 - Being kind, I would say probably about 10 years. |   |
| 00:48 - 10, 12 years. |   |
| 00:50 - Thousands of years. |   |
| 00:51 - 47 years, three months, five days. It's approximate. |   |
| 00:55 - We're kind of like cockroaches on the planet, no matter how much damage we'll do, enough of us will survive to procreate and keep it going. |   |
| 01:04 - Unless we can get to another planet, but then we're just gonna fuck it up like we did Earth. |   |
| 01:08 - Well, I think that we will be here for a long time, but we will change. We're gonna turn back into apes. |   |
| 01:16 (suspenseful dramatic music) |   |
| 01:22 - [Jeff] Have you ever wondered what would happen if a single species took over an entire planet? Maybe they're cute, maybe they're clever but lack a certain, shall we say, self-restraint? (somber dramatic music) What if they go too far? What if they go way, way, way, way, way too far? | [Past Lives of Humans](http://www.sustainable.soltechdesigns.com/human-past.html) is a repeating pattern of empire building having an as-usual outcome. For the first time the pattern, the empire is global. [JD] |
| 01:55 (somber dramatic music) |   |
| 01:57 [Jeff] How would they know when it's their time to go? |   |
| 02:05 (intriguing orchestral music) (intensifying orchestral music) (music fading) |   |
| 03:25 (old-timey music, old film clip, 1958, [The Unchained Goddess](https://www.youtube.com/watch?v=gCHVTQ2fLM0)) |   |
| 03:33 - [[Frank C. Baxter](https://en.wikipedia.org/wiki/Frank_C._Baxter) as Dr. Research] Due to our release through factories and automobiles every year of more than six billion tons of carbon dioxide, our atmosphere seems to be getting warmer. |   |
| 03:42 - [Richard Carlson, the writer] This is bad? |   |
| 03:44 - [[Frank Baxter](https://en.wikipedia.org/wiki/Frank_C._Baxter)] Well, it's been calculated a few degrees rise in the Earth's temperature would melt the polar ice caps. (crashing ice into water) And if this happens, an inland sea would fill a good portion of the Mississippi valley. Foreign weather, we're not only dealing with forces of a far greater variety than even the atomic physicists encounters, but with life itself. |   |
| 04:08 (piano synthesizer music, end of film clip) |   |
| 04:12 - [Jeff] That was 1958. We've known about the dangers of climate change for six decades. Back then, there was so much air pollution it would actually block out the sun. There was so much water pollution, rivers caught on fire. |   |
| 04:31 (synthesizer music) |   |
| 04:32 [Jeff} Forget throwing plastic bottles into the water, we tossed our cars in there. We also knew someday we'd run out of oil. |   |
| 04:42 [Robert MacNeil, news anchor] For millions of Americans, this may be the worst weekend they've ever faced for finding gasoline to give them the automobile freedom they take as their due. |   |
| 04:51 - [Jeff] I never doubted humans would find a better way and I wanted to be part of it. A scientist [Rachel Carson] sounded the alarm and the modern environmental movement was born. |   |
| 05:01 - [Rachel Carson, 1963] Unless we do bring these chemicals under better control, we are certainly headed for disaster. |   |
| 05:07 - [Jeff] Students all across the country organized the first Earth Day. |   |
| 05:12 - [Denis Hayes, 1970] This point in time, it's very, very fashionable to talk about the environment but as everyday procedure, find very, very little concrete being done. |   |
| 05:21 - [Jeff] As for me, you might say I was an early environmentalist. When I was nine years old, a bulldozer began knocking down the woods near my home. I retaliated by putting sand in its gas tank. |   |
| 05:35 (mellowly dramatic music) |   |
| 05:37 - [Jeff] When I grew up, I became a tree hugger and moved to the wilds of Northern Michigan to build a sustainable homestead and commune with nature. I wired my cabin for solar panels and heated with wood instead of fossil fuels. I wrote about sustainable living in environmental issues for the Mother Earth News and several news outlets. |   |
| 06:00 (mellow singing) |   |
| 06:03 - [Jeff] I traveled the country documenting invasive species. (banging and clunking, buzzing) Ecosystem collapse. |   |
| 06:11 (eerie music) |   |
| 06:13 - [Jeff] And species threatened with extinction. - (tapping) Come on, girls, boys. (crowd chanting) - I covered protests against destroying mountains for coal. (people shouting and clapping) And was once even confronted by the BP police. (car tires crunching) |   |
| 06:31 - [Sercurity] Journalist. - You're a journalist? |   |
| 06:32 - [Jeff] Yep, yep, yeah. |   |
| 06:33 - [Sercurity] By all means, you can take all the pictures you want. |   |
| 06:35 - [Jeff] Okay. |   |
| 06:36 - [Sercurity] We'll write in our report and then we have to send it to the FBI and the U.S. Attorneys Office. They'll call you. |   |
| 06:41 (traffic whizzing) (slamming) |   |
| 06:44 - [Jeff] Through all of this, I kept wondering, why are we still addicted to fossil fuels? So I decided to begin following the green energy movement. |   |
| 06:56 (mild rock music) |   |
| 06:59 - [Jeff] What better place to check out how our renewable energy revolution is coming along, than a solar festival in the Green Mountain state of Vermont. Powered by 100% solar energy. |   |
| 07:10 (bass guitar and guitar music) |   |
| 07:12 - [Promoter] Solar. (laughing) |   |
| 07:15 - [Jeff] I was having fun. And got a chance to ask about getting solar panels installed. |   |
| 07:20 - [Vendor] You can keep adding, so maybe every time you get a tax return, buy another solar panel? |   |
| 07:25 (singing rock music) |   |
| 07:28 - [Jeff] But then, a little rain began to fall. |   |
| 07:30 (rock band playing and singing) |   |
| 07:33 ♪ Packed up my guitar ♪ |   |
| 07:34 ♪ Headed to the nearest bowling alley ♪ |   |
| 07:36 - [Jeff] My camera man noticed some commotion behind the stage. |   |
| 07:40 (thudding) |   |
| 07:43 - [Jeff] What'd you guys set up here? |   |
| 07:44 - [Man in Cap] This is for biodiesel generators in case we lose power due to the rain. |   |
| 07:51 - [Jeff] So the festival's going on solar energy, primarily? |   |
| 07:54 - [Man in Cap] Primarily. We do need to bring some of this stuff in just 'cause we want to make sure we have enough power not to kill our fancy toys that we have lighting the stage. |   |
| 08:06 - [Jeff] Right. But the biofuel generator wasn't enough, so they wound up plugging into the electrical grid that we all use. |   |
| 08:14 - [Man in Cap 2] The other inverter operating, it's actually pulling power in from the grid, charging the batteries. It's running backwards from the way we originally intended to do it, but. |   |
| 08:24 (guitar music) |   |
| 08:27 - [Jeff] That was disappointing. But after all, it had been raining. Maybe next time things would go better. |   |
| 08:37 (mellow rock music) |   |
| 08:41 [Jeff] Luckily for us, hope was on the way. |   |
| 08:44 - [President Obama] It's been a long time comin' but tonight, change has come to America. |   |
| 08:50 (crowd cheering) (guitar music) |   |
| 08:54 - [Jeff] Green activists across the country cheered when newly elected president, Barack Obama, rolled out a trillion dollar stimulus package with nearly 100 billion dollars for green energy. |   |
| 09:04 (guitar strumming and people chanting) |   |
| 09:06 [Jeff] Green was finally ramping up and everyone wanted to be part of it. President Obama brought in environmental activist Van Jones, from the Apollo Alliance, with shovel ready projects. |   |
| 09:18 - [Van Jones] They've gotta put up tens of thousands of wind farms, they gotta put up millions of solar panels. |   |
| 09:23 - [Jeff] Former Vice President Al Gore, who had a few years earlier released an Oscar winning film, shared his ideas with the president. |   |
| 09:31 - [Obama] We have the opportunity now to create jobs all across this country, in all 50 states, to re-power America. |   |
| 09:41 - [Jeff] Al Gore had already encouraged billionaire airline owner, Sir Richard Branson, to invest big-time in green energy. |   |
| 09:49 - [News anchor Miles O'Brien] Branson is pledging future profits from his airline to the tune of perhaps three billion dollars. Three billion, that's with a B, to fight global warming! |   |
| 09:57 - [Interviewer] Is Al Gore a prophet? |   |
| 10:00 - [Branson] Ah, um, ah, how do you spell "prophet?" (laughing) |   |
| 10:05 (all laughing) |   |
| 10:09 - [Jeff] Investors came forward. |   |
| 10:11 - [Newswoman] Investor Vinod Khosla, known as the father of the clean tech revolution, has poured over a billion dollars of his own money into some fifty energy startups. |   |
| 10:22 - [Jeff] Major banks were eager to get involved. |   |
| 10:24 - [Spokesman, Goldman Sachs] By 2020, we think, renewables will require 395 billion on an annual basis. |   |
| 10:32 - [Jeff] Robert F. Kennedy, Jr., was both on the board of major environmental organizations and was leading a green energy investment group. |   |
| 10:40 - [Kennedy] We build wind farms, we build solar farms, once you build our plant, it's free energy forever. |   |
| 10:46 (calm music) |   |
| 10:47 - [Jeff] The Sierra Club received 50 million dollars from billionaire and former New York City mayor, Michael Bloomberg. Their mission?= Fight coal and promote clean energy. |   |
| 10:56 - [Michael Brune, Executive Director Sierra Club] So with the mayor's gift, here's what will happen. We'll have a large and aggressive presence in 46 states. |   |
| 11:02 - [Michael Bloomberg] It's time for America to find a new energy path. One that takes us beyond coal. |   |
| 11:07 - [Voice] So funny-- |   |
| 11:08 - [Jeff] And then Bill McKibben, one of the nation's leading environmentalists and author of a breakthrough book called "The End of Nature," formed an organization called 350.org with the mission of igniting a global climate movement. |   |
| 11:23 (calming music) |   |
| 11:24 - [Bill McKibben] Can I show off my necktie for a minute 'cause they made it for me yesterday. It's got that 350 on it 'cause it's the most important number in the world. |   |
| 11:33 - [Jeff] Things were looking up. And the green energy revolution was under way. Michigan had been hit hard by the Great Recession and hundreds of millions of dollars in green stimulus money was arriving. Now, to do their part for the new green economy, General Motors introduced a new line of electric vehicles. When the Chevy Volt was ready for release, I attended their press conference. |   |
| 11:59 - [David Joos, Consumer Energy] So, these electric vehicles are ready for public consumption and we're ready with the infrastructure, with the rates, with the communications. |   |
| 12:08 - [Spokeswoman, GM] I am extremely grateful to be here today and in fact, this is a chance for me to say, thank you, more formally. The Chevy Volt is upstairs. We'll be able to take a look at it. |   |
| 12:17 (banging metal) |   |
| 12:18 - [Woman] We got about 1,000 photos. |   |
| 12:19 - [Jeff] Yeah. |   |
| 12:20 - [Demonstrator] Here is the plug. (crowd laughing) (clicking) It's as simple as that. |   |
| 12:29 - [Jeff] The batteries are in the trunk? |   |
| 12:31 - [Spokeswoman, GM, Kristin Zimmerman] No, the battery in this particular design is a T-shape, right down the center and across the backseat area. 'Cause everybody thought we killed the electric vehicle. No, we didn't. It's alive and well. |   |
| 12:47 - [Jeff] So, what's charging the batteries right now? What's the source of electricity? |   |
| 12:51 - [Spokeswoman, GM] Well, here, it's coming from the building. |   |
| 12:53 - [Jeff] I mean, is it, what's our mix of power? |   |
| 12:55 - [Spokeswoman, GM] Oh, actually, Lansing feeds the building. |   |
| 12:58 - [Jeff] What's that? |   |
| 12:59 - [Spokeswoman, GM] Lansing feeds power to the building. So, I don't know-- |   |
| 13:03 - [Jeff] They're-- |   |
| 13:04 - [Spokeswoman, GM] I betcha they're a bit of coal? I think they're heavy on natural gas, aren't they? |   |
| 13:08 - [Jeff] Right now, the car's charging off your grid? |   |
| 13:10 - [J. Peter Lark, Lansing Board of Water & Light] Right. It would be charging off our grid, which is about 95% coal. |   |
| 13:18 - [Jeff] How long do you think it will be before there's a solar and wind powered grid? |   |
| 13:23 - [Spokeswoman, GM] Oh, golly. |   |
| 13:24 - [Lark] To suggest that all of the power used for these cars will be generated from wind and solar, in the very near future, would not be correct. In fact, these, we're talking about charging these up at night, so there won't be any solar at that time. So, we're down to wind and very often, at night, the wind does fall off. |   |
| 13:43 - [Spokeswoman, GM] I don't think coal is bad. The what? - The big val-- Mountain top removal. - Oh, mount... Oh yeah, oh yeah. (laughing) |   |
| 13:50 - [Jeff] Yeah. |   |
| 13:51 - [Spokeswoman, GM] It's got lovely BTUs, it's got lovely energy value. How do you burn it more cleanly? I mean, do you see natural gas getting bashed? |   |
| 14:02 - [Lark] We will be delivering power based on natural gas very shortly. And even with that mix, we intend to use biofuels if we can. |   |
| 14:12 - [Jeff] Have you gotten any support? |   |
| 14:14 - [Spokeswoman, GM] Oh, the environment groups are extremely supportive. |   |
| 14:16 -[Lark] We did install the state's largest solar array at my company, The Board of Water and Lights, just down the street from here a few miles if you want to take a look at it. What outfit are you with? |   |
| 14:26 - [Jeff] New World Media, we're doing a segment on the renewable energy. |   |
| 14:28 - [Lark] Oh, excuse, I gotta go for a second. |   |
| 14:30 - [Jeff] Okay, sure. |   |
| 14:30 - [Lark] Thanks. |   |
| 14:31 (people chatting) |   |
| 14:35 - [Jeff] I decided to take him up on his offer to check out their football field sized solar array right down the street. |   |
| 14:43 - [David Gard, Michigan Environmental Council] What we're trying to do with this kind of a tour is, get a sense for what they've already done, as an indication of what we could do to push the envelope even further. |   |
| 14:51 - [Jan Nelson, Lansing Board of Water & Light] We took a hard look at wind and determined that, around here, there's not really any real good wind coming through all the time. That's what we liked about solar. You would get the power when you most needed it. Pass these around, look at 'em. They are pliable. Made in Michigan, that was another good thing. Although, the efficiency of these panels is only about, just under 8%. If you happen to be NASA and you happen to own a rover running around Mars, they have very efficient panels. But, we can't afford those at about a million dollars a square inch. |   |
| 15:26 - [Jeff] How many homes would this array provide electricity for? |   |
| 15:29 - [Nelson] The standard answer that we tell everybody is, that we're providing enough to meet the peak requirements of 50 homes. However, for most of the people that look at it a little bit closer, we generate about 63, 64 thousand kilowatt hours a year. Our average customer uses about six thousand kilowatt hours a year. Six thousand into 64, it's just a little over 10. We can meet the energy requirements for 10 homes. Over a year. |   |
| 15:55 (traffic humming) |   |
| 15:57 - [Woman asking question] Will that be an incentive to put more solar on? |   |
| 16:01 - [Nelson] Well, if you wanted to make all of the energy required for the city of Lansing over a year? |   |
| 16:07 - [Woman asking question] Well, how about-- |   |
| 16:08 - [Nelson] You'd have a solar array that was three miles by five miles. |   |
| 16:11 - [Woman asking question] Right. But-- |   |
| 16:12 - [Nelson] We're not gonna do that. |   |
| 16:13 - [Woman asking question] But, but, I mean. (woman's voice fades out) |   |
| 16:15 - [Jeff] My friend from the Sierra Club wanted him to be more positive, but he was not interested. As a consequence of the big push for green energy, wind farms were arising around the nation, including near my home in northern Michigan. |   |
| 16:34 - [John Wozniak, Engineer] We've done coal and nuclear for years. We've been trying to get in more into the renewable side. These are the largest in Michigan, I think it's 482 foot total. |   |
| 16:43 - [Jeff] How many yards of concrete? |   |
| 16:44 - [John] It was 800 yards of concrete in the base, right around 140 tons of resteel. |   |
| 16:49 - [Jeff] What are those blades made out of? |   |
| 16:50 - [John] That's all fiberglass and balsam. They're about 36,000 pounds a piece. This tower will weigh 800,000 pounds when we're done. Then the cell is 220,000 pounds and the hub rotor assembly is another 160. It's pretty substantial. |   |
| 17:05 (wind blowing) |   |
| 17:08 - [Jeff] They were impressive machines. But is it possible for machines made by industrial civilization to save us from industrial civilization? | Is there an energy shortage, or a longage of demand to run unneeded machines? [AN]  |
| 17:20 (wind blowing) (group talking together) |   |
| 17:27 [Jeff] In environmental leader Bill McKibben's home state of Vermont, the Green Mountain state, a site was being cleared for the installation of wind turbines. A group of citizens was concerned about how the construction might affect the mountains they love. I joined them for a tour. |   |
| 17:43 - [Citizen] It's going to be 21 turbines. |   |
| 17:45 - [Group] 21? |   |
| 17:46 - [Citizen] Yeah. - On this project? |   |
| 17:47 - [Citizen] In this project, yeah. |   |
| 17:49 [Citizen] The estimate was maybe there would be three full-time jobs. |   |
| 17:54 - [Citizen 2] If the goal is to try to make Vermont the leader in climate change, I appreciate looking to the sky in the hopes we can do that. But more importantly, I'm personally looking at the ground thinking, this is not the kind of legacy I want to leave to my kids. When I was a kid we'd go hiking in these woods, we would be able to drink from the waters down the hill here, and now you have to question that. |   |
| 18:18 - [Jeff] And how long are these towers supposed to last? |   |
| 18:20 - [Man] 20-something years, 20-- |   |
| 18:21 - [Citizen] I know, it's just a nanosecond. |   |
| 18:24 - [Jeff] 20 years? |   |
| 18:25 - [Citizen] Oh, it's a nanosecond in the time of energy. |   |
| 18:28 - [Jeff] Has anybody considered that this is mountain top removal for wind instead of coal? |   |
| 18:32 - [Man in Hat] Yeah, and we've even had people say, If you can do mountain top removal in Kentucky and West Virginia for coal, then it's about time the rest of the country shared in mountain top removal, too. Uh-oh. |   |
| 18:46 - [Jeff] You think he's gonna tell us to move out? |   |
| 18:47 - [Man in Hat] Probably. The thing is that you've got to have a fossil fuel power plant backing it up and idling 100% of the time. Because if you cycle up or cycle down, as the demand on the wind comes through, then you actually generate a bigger carbon footprint than if you just ran it straight. |   |
| 19:05 - [Jeff] Do you ever go to things where they just go, "That's not true. It doesn't matter, we're gonna have a smart grid." |   |
| 19:10 - [Man in Hat] Doesn't make any difference, they still gotta-- They're using it. - Have it idling. Because, let's just say the wind stopped right now. Just stopped for an hour. You've got to have that power. |   |
| 19:21 - [Jeff] What do you do? |   |
| 19:22 - [Man in Hat] I'm an environmental health and safety consultant. I usually work with businesses to help them do things, but I would never work with scum like this. |   |
| 19:30 (leaves crunching) |   |
| 19:33 - [Man ducking under barrier] You didn't get me on camera doing this, did ya? Not being judgmental or trying to play God, but we've got to deal with population growth and sustainable resources, we've all gotta cut back. All this energy's supposedly going to heat a water park. We can find unique and different ways to waste energy. This is not a Vermont company. Green Mountain Power will be bought out by Gaz Metro and Gaz Metro is owned by Enbridge, as I understand it, which is a big resource company in Canada which is exploiting the PowerSands that wants to build the XL pipeline. See, it's-- |   |
| 20:14 - [Woman] And they're all in bed together. |   |
| 20:18 - Still we don't know the whole story. |   |
| 20:20 - [Jeff] Have you asked Mr. McKibben to come see this? |   |
| 20:22 - [Woman] He thinks anything renewable is good. |   |
| 20:25 - [Jeff] Yeah. |   |
| 20:25 - [Woman] So that's what I've heard people say. |   |
| 20:27 (wind blowing) (up tempo music) |   |
| 20:38 - [Jeff] I am in a strange position. I'm against our addiction to fossil fuels and have long been a fan of green energy. But everywhere I encountered green energy, it wasn't what it seemed. |   |
| 20:54 - [Spokesman, electric car] This is like a perpetual energy battery. |   |
| 20:58 - [Jeff] And where do you get the hydrogen from? |   |
| 20:59 - [Spokesman] The hydrogen that's in, the hydrogen is sourced from any hydrocarbon material. So, you can get it from natural gas, you can get it from any petroleum oil based product. |   |
| 21:15 - [Jeff] I read about a zoo that was said to be powered by elephant manure. But it turned out the elephants didn't even produce enough manure to heat the elephant barn. |   |
| 21:24 - [Zoo Keeper] Yeah, we don't even really make enough and what we had, elephant wise, couldn't even do that. We would need a lot more. |   |
| 21:29 - [Jeff] More elephants? |   |
| 21:30 - [Zoo Keeper] Yep, (woman laughing) more elephants or manure. |   |
| 21:33 - [Jeff] Ethanol plants also seem to have a secret ingredient. |   |
| 21:37 - [Spokesman] This is the most productive farmland in the world and we're not that far west of the biggest coal mines in the world, as well. So, bring the two together and have an ethanol plant. |   |
| 21:47 - [Jeff] Great, so ethanol was reliant on two things. A giant, fossil fuel based, industrial agricultural system to produce corn and even more fossil fuels, in the form of coal. All of this in the attempt to replace fossil fuels? It was enough to make my head explode. I was getting the uneasy feeling that green energy was not going to save us. And I wasn't the only one. |   |
| 22:18 - [Richard Heinberg, Author, The End of Growth] I've counted something like 25 different alternative energy options. So surely, among all of those, there are enough sources of energy to keep us living basically the way we are in perpetuity. That's not the reality. Currently, we're getting, in some cases, no energy from these potential options. |   |
| 22:39 - [Jeff] Richard York, of the University of Oregon, published a study in the Journal of Nature in which he posed a question, "Do non-fossil energy sources "actually replace fossil fuels?" |   |
| 22:50 - [Richard York] What we implicitly assume, often, the substitute pushes out the thing you want it to substitute for. What you find is, nations that add non-fossil energy sources do not seem to see a particular suppression of fossil fuels. |   |
| 23:05 - [Jeff] That's pretty mind blowing. You've got billions of dollars beings spent and green energy is not even replacing fossil fuels? |   |
| 23:12 - [York] They don't even know that that's a question, yes. |   |
| 23:15 - [Nina Jablonski, Anthropologist, Penn State University] The story that we're in, right now, is okay, we're in ecological hot water, but there are technological fixes and if we're just creative enough, if we're just ingenious enough and if we just work hard enough, we will triumph. Seeking technological fixes, one after another, is simply going to lead us to another level of catastrophe sooner rather than later. |   |
| 23:40 - [Richard Heinberg] We wanna believe that these things are gonna be available for us, so if we get a little worried and somebody comes up with a new thingy and promises that this will do it for us, we wanna believe it. |   |
| 23:56 (guitar strums) |   |
| 23:59 - [Jeff] Because we're a little worried, are we desperate to accept any idea that sounds alternative? Or green? |   |
| 24:07 (guitar strumming) |   |
| 24:09 [Jeff] Are we avoiding looking too closely because we don't want to know the answer? Ozzie Zehner, a visiting scholar at UC Berkeley and Northwestern University was asking some of the same questions. |   |
| 24:27 - [Ozzie Zehner] I mean, I thought that solar and wind were probably very good solutions. It wasn't really even that long ago. One of the most dangerous things right now is the illusion that alternative technologies, like wind and solar, are somehow different from fossil fuels. What I hear a lot of times is solar cells are made out of sand. |   |
| 24:44 - [Announcer] Have you ever thought about solar panels? The main ingredient that makes them work is silicon, or sand. |   |
| 24:50 - [Announcer] This is the raw material chips are made of, sand. |   |
| 24:53 - [Zehner] They don't use sand at all. I'll show you what... So, this is one of the ingredients, it's actually mined quartz. |   |
| 25:04 (rocks clattering) (rock exploding) |   |
| 25:09 - [Announcer] Spruce Pine, North Carolina, regarded as the finest source of high purity quartz in the world, the semiconductor, solar and communication applications. |   |
| 25:18 - [Zehner] You can't use sand because sand has too many impurities. So, you start with very high quality quartz and a very high quality coal, and then you put those two together into an arc furnace and you melt them. |   |
| 25:30 - [Woman] The quartz is then melted with coal in a large furnace at temperatures of up to 1,800 degrees. |   |
| 25:38 - [Zehner] And so you need more coal to do that. I'll get another coal out. When we melt these together, we get silicon metal and carbon dioxide. The carbon dioxide just goes off and you got rid of the carbon and you're left with silicon metal. This is not clean coal. (laughing) |   |
| 25:52 - [Jeff] Not clean coal. Ozzie Zehner said it was an illusion that renewables were replacing coal or any fossil fuel. Environmental groups continue telling a different story. |   |
| 26:03 - [Michael Brune, Executive Director, Sierra Club] We've already seen more than 25% of the U.S. coal fleet has already either retired or is on a schedule to retire. |   |
| 26:11 - [Jeff] Coal plants were closing, but Ozzie explained that well meaning people were being misled. |   |
| 26:16 - [Zehner at Reid Gardner Power Plant, Nevada] NV Energy's now gonna go ahead and shut down the plant and go with renewable. One of the largest solar plants and that's gonna happen right behind me. Since you can't replace a coal plant with solar, they're actually replacing the coal plant with two natural gas plants. And natural gas is a fossil fuel. This is the Las Vegas Co-Gen natural gas plant. This is one of the facilities that's replacing the coal plant that's being shut down. This is the Sun Peak generating facility. This is the second natural gas plant that was used to replace the coal plant. And you hear the same story in Iowa. |   |
| 26:48 - [News Woman] Instead of using energy generated by coal-fired power plants, the solar farm will now avoid about 2.1 million pounds of carbon pollution. |   |
| 26:57 - [Zehner] But then they're building a larger natural gas plant. This is a 650 megawatt natural gas plant. That's four times more megawatts than the coal plant over there that it's replacing. And they're doing the same thing in North Carolina, which was that subject of that Years of Living Dangerously series. |   |
| 27:15 - [Mary Anne Hitt, Directer, Beyond Coal] Duke Energy operates a coal plant right outside of Asheville that is the biggest source of climate pollution in western North Carolina. And we are working to retire that plant and replace it with clean energy. |   |
| 27:25 - [Zehner] But what they don't tell you is that we're also building a larger natural gas facility. |   |
| 27:29 - [Van Jones] So, we'll be retiring a two-unit 376 megawatt coal plant. We'll invest $750 million to build a state-of-the-art natural gas plant. |   |
| 27:39 - [Zehner] When Michael Brune stands up and talks about clean energy, he's using solar cells and wind turbines. |   |
| 27:43 - [Michael Brune, Sierra Club] This is the new world. 100% clean energy. |   |
| 27:46 - [Zehner] When Michael Bloomberg stands up and says, "Cleaner energy," he's talking about natural gas. |   |
| 27:51 - [Bloomberg] Create cleaner energy, solar, wind and natural gas. |   |
| 27:55 - [Ozzie Zehner] In fact, the Sierra Club's Beyond Coal campaign actually coincides with one of the largest expansions of fossil fuel production that we've ever pulled off. Most of that being natural gas. |   |
| 28:06 - [Jeff] Ozzie's assertion that renewables were not replacing fossil fuels, if true, would upend all of our assumptions about green energy and what was going to save us. |   |
| 28:17 (tranquil piano music) |   |
| 28:18 [Jeff] What would happen if I asked the same question to industry insiders? Like, where do solar panels come from? |   |
| 28:25 - [Vendor, Intersolar Expo] Well, you do have to start with a mine. |   |
| 28:26 - [Jeff] Wait till you see my-- |   |
| 28:27 (laughing) |   |
| 28:29 [Jeff] Or, what's stopping us from running the world on 100% solar and wind? |   |
| 28:33 - [Vendor, Intersolar Expo] Well, intermittency is one of the major challenges. |   |
| 28:36 - [Vendor 2, Intersolar Expo] Good stability. |   |
| 28:37 - [Vendor 3, Intersolar Expo] The sun's everywhere, except when it's not there. |   |
| 28:40 - [Adriann McCoy, Electrical engineer] There's a lot of developers that were flocking to California, wanting to connect their solar farms and wind farms. The utilities would turn to me and my team to help them look at what the impact to their grid would be. |   |
| 28:51 - [Jeff] When we add solar cells or wind turbines to a grid, do we get to shut off a coal plant? |   |
| 28:56 - [Adriann McCoy] That's certainly the goal, the problem is, or the difference is that renewables are intermittent. All of the sudden, a cloud cover could come over and your solar generation could drastically decrease. And if you don't have something else there to meet whatever the load is at that moment, then you're gonna have power outages. |   |
| 29:14 - [Jeff] So, we don't get to turn a fossil fuel power plant off when the sun is shining or the wind is blowing? |   |
| 29:19 - [Philip Moeller, Federal Energy Regulatory Commissioner] Well, it's not that easy. We need to be able to back up that power to keep the system steady all the time so it doesn't collapse. Most likely that's through fast-acting gas plants, but also what we call the base load plants, either nuclear or coal that are on all the time but that maybe can be dialed down during the day and dialed up when demand starts rising. |   |
| 29:44 - [Jeff] Does it affect the efficiency to turn fossil fuel power plants on and off? |   |
| 29:48 - [Moeller] Oh, yeah. They don't like to be dialed up and down. It does make, that's wear and tear for them. |   |
| 29:54 - [Adriann McCoy] Turning them on, turning it off, there's energy used and lost and any time, kind of like when you turn on your car and off, you use a little extra gas to get it turned on. I do still think you have to maintain a base load of some kinds. |   |
| 30:06 - [Jeff] What's the solution then? |   |
| 30:07 - [Spokesman] You need energy storage. |   |
| 30:08 - [Moeller] Without storage, you can't count on it. |   |
| 30:12 - [Adriann McCoy] If you can store the energy that's created off of things that are intermittent like solar and wind, you can store that, now you're reducing your need for a base load. |   |
| 30:23 - [Jeff] But would adding storage like batteries increase the carbon footprint? |   |
| 30:27 - [Expert] Yeah, absolutely. In a big way, actually. And as more energy storage gets on the grid, it has a mass scale implication. |   |
| 30:37 (piano music) |   |
| 30:38 - [Jeff] When I looked up how much battery storage there is, it was less than one-tenth of one percent of what's needed. In a couple years, they begin to degrade and need to be replaced a few years later. I learned that the solar panels don't last forever, either. |   |
| 30:53 - [Vendor] Some solar panels are built to last only 10 years. So, it's not as if you get this magic free energy. I don't know that it's the solution, and here I am helping to sell the materials that would go into photovoltaics. |   |
| 31:10 - [Jeff] And so to overcome profound limitations of solar and wind, rarely discussed in the media, a new generation of technology was rising in the California desert. |   |
| 31:20 - [Woman] What is this? |   |
| 31:21 - [Joseph Desmond, BrightSource Energy, Marketing & Government Affairs Senior Vice President] What we're using is a field of mirrors to focus sunlight onto a tower. The power plant itself, at 377 megawatts, will be the largest of its kind in the world. |   |
| 31:31 - [Arnold Schwarzenegger] This will become the biggest solar plant in the world! (crowd clapping and cheering) There's some people that look out in a desert, they see miles and miles of emptiness. I see miles and miles of a gold mine. |   |
| 31:44 - [Jeff] But this next generation had a fossil fuel secret, too. |   |
| 31:49 - [Zehner at Ivanpah Solar Array, Mojave Desert] This solar facility burns natural gas pretty much every morning in order to get it started up. |   |
| 31:53 - [Jeff] How long do they have to burn it for it? |   |
| 31:55 - [Zehner] Hours, usually. This is the incoming natural gas for the facility. This plant would work about as well without natural gas as I would without coffee in the morning. (laughing) |   |
| 32:03 - [Jeff] Or maybe how you would be without food. |   |
| 32:05 - [Zehner] Without food, yeah. (laughing) They have to file for acid rain permits, permits for nitrous oxide emissions, they have to apply for carbon offset permits. Because they're producing carbon dioxide here, so they have to offset that. The whole thing is built using fossil fuel infrastructure, from the concrete to the steel to the mirrors, to the backing on the mirrors. The sun is renewable, but the solar arrays are not. |   |
| 32:29 - [Jeff] Oh, come on. There's got to be something renewable. Glass is renewable. |   |
| 32:32 - [Zehner] Glass. (laughing) Glass is not renewable. |   |
| 32:34 - [Jeff] Iron's renewable. |   |
| 32:36 [Zehner] (laughing) |   |
| 32:38 [Jeff] Aluminum? That's renewable. I recycle my soda cans. (laughing) I know it's renewable. |   |
| 32:42 - [Zehner] Yeah, the problem with all of these materials is that it takes an incredible amount of energy to mine and process all of the materials that go into building something like this. You use more fossil fuels to do this than you're getting benefit from it. You would have been better off just burning the fossil fuels in the first place, instead of playing pretend. |   |
| 33:03 - [Jeff] That green energy has nothing to do with fossil fuels is apparently a story only meant for you and me. Here is Robert F. Kennedy, Jr., speaking to oil and gas company insiders. |   |
| 33:14 - [Kennedy] It's a combination solar gas plant. It's a turbine that we just take from a gas plant, suspend it from a big scaffolding, a tower, and surround it by giant mirrors in the desert. The plants that we're building, the wind plants and the solar plants, are gas plants. |   |
| 33:29 - [Jeff] What kind of game is being played? |   |
| 33:32 - [Zehner] Well (gusting wind) we're basically just being fed a lie. For instance, you'll hear about Germany running on wind and solar. |   |
| 33:39 - [News clip] 35% right now. |   |
| 33:41 - [News clip 2] 50% of their power. |   |
| 33:43 - [News clip 3] They were days this past summer when the Germans were generating 80% of their power from the sun. |   |
| 33:48 - [Ozzie Zehner] But Germany is still Europe's largest consumer of coal. |   |
| 33:51 - (speaking in foreign language) |   |
| 33:58 - Uhh. |   |
| 33:59 - [Ozzie Zehner] Only a small fraction of their energy actually comes from wind and solar. In fact, Germany just built a large terminal to import natural gas from the United States. Elon Musk, the founder of Tesla, when he announced his Gigafactory battery plant, he said it would power itself with wind and solar energy. |   |
| 34:16 - [Elon Musk] Through a combination of geothermal wind and solar, it will produce all energy that it needs. |   |
| 34:22 - [Ozzie Zehner] But in fact, it has lines connecting it to the same electrical grid that we're all connected to. Electric cars, wind turbines and solar panels use rare earth metals. And in fact, the rare earth mine is right up the street from here. In mining these deep deposits, about 90% of what they pull up out of the ground contains uranium, thorium and low level of other radionuclides. Radioactive waste that has to be disposed of somehow, they kind of turn into a paste and spread it over the desert floor. |   |
| 34:57 - [Jeff] Well, that's good for the desert, right. |   |
| 34:58 - [Zehner] Yeah, the desert loves that. (laughing) Tesla's electric cars are built with aluminum, which uses eight times more energy to manufacture than steel. They use lithium, which also rely on toxic mining. And even more graphite, which is one of the rarest forms of carbon. In fact, the investors wanted to open several new graphite mines after Tesla announced the Gigafactory. Apple claims to be 100% renewable. |   |
| 35:23 - [Apple Spokeswoman] We never stop thinking about what's best for the planet. We now run Apple on 100% renewable energy. (clapping and cheering) All of our facilities, worldwide. |   |
| 35:34 - [Ozzie Zehner] And they did chop down a forest to put up solar panels near their North Carolina plant. But they didn't disconnect from the grid and they can't. |   |
| 35:41 - [Suzanne Goldenberg, The Guardian] Duke says energy hungry companies like Apple can never go entirely off the grid. |   |
| 35:46 - [Thomas Williams, Duke Energy] They're still hooked up to our grid. |   |
| 35:48 (fast paced energetic music) |   |
| 35:49 - [Ozzie Zehner] Despite all the claims, I haven't found a single entity anywhere in the world that's running on 100% solar and wind alone. |   |
| 35:57 (suspenseful music) |   |
| 35:59 - [Jeff] It turns out, you don't just need fossil fuels to run a place like Ivanpah, you need the devil himself, or in this case, themselves. |   |
| 36:09 - [Ozzie Zehner] All of the mirrors that you see there are built by the Koch brothers, Guardian Glass Industry, a company that they control. Koch Carbon creates a lot of the inputs that are used to create the cement and the concrete and the steel. And not only that, they build the plants that builds polysilicon for solar cells. They have, actually, their own solar line called Solar Molex. From every step of the process, the Koch brothers are there. |   |
| 36:31 - [Jeff] But, they're the evil doers. |   |
| 36:33 - [Zehner] Yeah (laughing), the funny part is that when you criticize solar plants like this, you're accused of working for the Koch brothers. (laughing) That's the idiocy in all of this. This absolutely can not extend civilization's life. This relies on the most toxic and industrial processes that we've ever created. |   |
| 36:52 (drum rolling) (small triangle dinging) (pulsating dramatic music) (music building in intensity) (up tempo dramatic music) (music building) (music tempo increasing) (music ending dramatically) |   |
| 39:12 - [Spokesman] The beauty of a solar facility, and particularly this technology, is that it is so environmentally benign. |   |
| 39:19 (roaring of large machinery) |   |
| 39:39 [Jeff] I, too, had once thought that deserts could be sacrifice zones. I was wrong. Deserts are not dead. They are, in fact, full of ancient life. |   |
| 39:53 (powerful music) |   |
| 40:03 In the desert, the Joshua tree stands, waiting, waiting for the giant ground sloths and the mammoths that shall never return. The Joshua tree depended on the giant mammals to reach up high and eat their seeds, and thus disperse the Joshua tree. |   |
| 40:22 (mystical vocal music) |   |
| 40:25 [Jeff] But now, stranded in time and space, the Joshua tree awaits a new fate. To be sacrificed in the name of progress. |   |
| 40:37 - [News Anchor] Joshua trees are torn down to make way for solar projects. 23ABC's Cassie Carlisle travels to the Mojave Desert to talk to neighbors. |   |
| 40:45 - [Cassie Carlisle] They're not your usual tree. More like something from fiction, but these Joshuas are causing quite an uproar. |   |
| 40:51 - [Resident] No, it makes me sick that they're clearing them off, killing them real quick. And now they're grinding them up, getting rid of all the evidence. |   |
| 40:59 (powerful dramatic music) |   |
| 41:06 - [Jeff] Not far from Ivanpah Solar, Daggett, California was home to several generations of solar arrays. Including some of the first on the planet. Ozzie and I thought we would take a trip to see where it all began. |   |
| 41:28 (wind blowing loudly) |   |
| 41:37 - [Zehner] This is one of the sunniest places in the planet, really, and it's the center of the solar industry and they've been building and dismantling and building arrays here for about 40 years. |   |
| 41:49 (man's voice on loudspeaker) |   |
| 41:50 - [Jeff] Then we happened to run into the mayor of Daggett. |   |
| 41:53 - [Mayor] And then the solar plants out there, my husband, back in, I'd say '83, '84, they worked out there building that solar plant out there. |   |
| 42:01 - [Zehner] Yeah, the SEGS. |   |
| 42:02 - [Mayor] And everybody here worked. |   |
| 42:04 - [Zehner] How's that hold up? Is it, are the jobs still here? |   |
| 42:07 - [Mayor] No. Jobs went bye-bye. They have their normal people that run the plant, plant operators and stuff like that the big wigs, you know, they have that. Where that energy's going, I don't know. |   |
| 42:18 - [Jeff] Were you originally optimistic that the solar would bring more jobs and development for people? |   |
| 42:23 - [Mayor] Yeah, we really did, we really did. A lot of things come into this town, they come and go. They go really fast. |   |
| 42:28 (loud wind blowing) |   |
| 42:32 - [Zehner] Do you see this? |   |
| 42:34 - [Jeff] Then Ozzie and I discovered that the giant solar arrays had been razed to the ground. |   |
| 42:40 - [Zehner] Oh, my God. |   |
| 42:42 (wind whooshing) |   |
| 42:43 - [Jeff] I mean, this was huge. It suddenly dawned on me what we were looking at. A solar dead zone. Look at the blowing sand. |   |
| 42:57 - [Zehner] Yeah. There's sand everywhere, there's sand dunes forming around this area. |   |
| 43:01 - [Jeff] Wow. |   |
| 43:04 (humming of solar factory) (solemn music) |   |
| 43:17 [Jeff] So, after all the mining, the fossil fuels,\ the toxins, the environmental destruction, here's what happens next. Only a few years after it was built,\ things at Ivanpah began to fall apart. Broken mirrors littered the desert. |   |
| 43:43 (music intensifying) |   |
| 43:44 [Jeff] Yes, these giant solar and wind technology installations may last only a few decades, (somber music) then tear it down and start all over again. |   |
| 43:55 (somber music) |   |
| 43:59 [Jeff] If there is enough planet left. (somber music) It was becoming clear that what we have been calling green, renewable energy and industrial civilization, are one and the same. Desperate measures not to save the planet, (thunder crashing) but to save our way of life. |   |
| 44:23 (somber music) |   |
| 44:26 [Jeff] Desperate measures rather than face the reality, humans are experiencing the planet's limits all at once. |   |
| 44:36 - [Steven Running, Ecologist, University of Montana] Every different perspective I look at and imagine, well, we could do more of this, or go to a larger area or use more of that. Well, it turns out, there isn't more. I looked at marine production and fish production and found that peaked 20 years ago. More and more of what we eat is from fish farming. The current acres of actively farmed land, that has peaked also. The rivers are already being irrigated to about the limits of what they can sustain. The Colorado River doesn't get to the ocean anymore. Well, then you start looking at ground water, the southern great plains, and I think they can almost predict when they will run out of ground water and it's in a decade or two. |   |
| 45:26 (somber music) |   |
| 45:27 [Steven Running] A human vulnerability at the global scale, that any one of them we could maybe compartmentalize, but we're seeing them propagating across topic after topic of society and the earth system. And I don't think the people in charge are near nervous enough. |   |
| 45:54 - [Jeff] Though each of them takes climate change seriously, every expert I talked to wanted to bring my attention to the same, underlying problem. |   |
| 46:02 - [Robert Heinberg] They're too many human beings using too much, too fast. |   |
| 46:07 - [Steven Churchill, Anthropologist] As a global community, we really have got to start dealing with the issue of population. |   |
| 46:12 - [Nina Jablonski] Population growth continues to be the, not the elephant, the herd of elephants, in the room. |   |
| 46:18 - [Jeff] Can a single species that's come to dominate an entire planet-- |   |
| 46:21 - [Steven Running] Be smart enough to voluntarily limit its own presence? |   |
| 46:26 - [Jeff] Is there any precedence for that in nature? |   |
| 46:28 [Running] (laughing) Wow. |   |
| 46:31 - [Nina Jablonski] We have to have our abilities to consume reined in. Because we're not good at reining them in if there are seemingly unrestrained resources. |   |
| 46:43 - [Steven Churchill, Anthropologist] Species hit the population wall a lot and then they crash. I mean, that's a common story in biology. If that happens to us, in a way, it's the natural order of things. And I don't think we're gonna find a way out of this one. I don't. |   |
| 46:58 - [Jeff] As a scientist, what leads you to that conclusion? |   |
| 47:01 - [Churchill] Well, because right now, a large percentage of that number is supported by industrial agriculture, which is heavily subsidized by oil. And it's not sustainable. And there's no going back. Without seeing some sort of major die off in population, there's no turning back. |   |
| 47:23 - [Jeff] What's the thing that nobody ever asked you that you want-- |   |
| 47:25 [Robert Heinberg] (laughing) Nobody's ever asked me if I'm scared. |   |
| 47:30 - [Jeff] Yeah. |   |
| 47:31 - [Heinberg] And, I am. I actually am scared. I lose sleep over all of this. |   |
| 47:36 (somber music) |   |
| 47:42 - [Jeff] It took modern humans tens of thousands of years to reach a population of 700 million. And then we tapped into millions of years of stored energy, known as fossil fuels. Our human population exploded. It increased by 10 times in a mere 200 years. Our consumption has also exploded. On average, ten times per person, and many times more in the Western world. You put the two together, the result is a total human impact 100 times greater than only 200 years ago. |   |
| 48:16 (mellow music) |   |
| 48:18 [Jeff] And that is the most terrifying realization I have ever had. We humans are poised for a fall from an unimaginable height. Not because of one thing. Not climate change alone. But all the human-caused changes the planet is suffering from. | The height is easily imagined: look around. It is the way down that can't be imagined. [JD] |
| 48:41 (slow tempo music) |   |
| 48:43 [Jeff] So, why are bankers, industrialists and environmental leaders only focused on the narrow solution of green technology? Is it the profit motive? And why, for most of my life, have I fallen for the illusion green energy would save us? |   |
| 49:00 (waves) (squeaking door) |   |
| 49:06 [Jeff] Clearly, to answer this question, I needed professional help. |   |
| 49:10 - [Sheldon Solomon, Social Psychologist, Skidmore College] Keep my stuff. No, I never heard... |   |
| 49:13 - [Jeff] I'll just be honest with you about my dilemma. You can be my clinical social psych-- (laughing) It's like, the right has religion. And they have a belief in infinite fossil fuels. Our side says, "Oh, it's gonna be okay", we're gonna have solar panels. "We're gonna have wind towers." Soon as I heard you talk about our denial of death, I'm like, "Could that be it? Could it be that we can't face our own mortality? Could we have a religion that we're unaware of?" | Therefore, don't take sides. Listen to Nature who has all the answers. [JD] |
| 49:42 - [Sheldon Solomon] Absolutely. I think you've hit the proverbial nail on the head. What just differentiates people from all other forms of life is that, we're not only here but that we know that we're here. If you know that you're here, then you recognize, even dimly, that you'll not be here someday. And on top of that, we don't like that we're animals. So, we don't like that we're gonna die someday. We don't like that you could walk outside and get hit by a fuckin' meteor. What human beings did back in yesteryear is to envelop ourselves in culturally constructive belief systems. You know, call them cultures, call them world views, schemes of things. Whatever you call them, every human community has them. Every culture has an account of the origin of the Universe. Every culture has a prescription for how you're supposed to behave while you're here. And every culture offers its denizens hope of immortality, either literally or symbolically. |   |
| 50:44 [Sheldon Solomon] Then the question is, well, what happens when you bump into people who don't share those beliefs? Whether you know it or not, whether you like it or not, but that's undermining the confidence with which you subscribe to your own views. And exposing you to the very anxiety that those beliefs were constructed to eradicate in the first place. If we're to make progress, whatever that word means, or even to persist as a form of life, we're gonna need to radically overhaul our basic conception of who and what we are, and what it is that we value. Because the people that you referred to earlier, both on the left and the right that think we're gonna be able to discover more oil. Or solar panel ourselves into the future, where life will look pretty much like it does now. You know, only cleaner or better. |   |
| 51:45 - [Jeff] Either with more oil or greener oil. |   |
| 51:47 - [Sheldon Solomon] Or both. I think that's just frankly delusional. |   |
| 51:51 - Jeff] What I'm hearing is that, if I haven't come to grips with my own anxiety about death and life, and presented with a reminder of that, I'm highly likely to make some tragic decisions for the community. |   |
| 52:07 - [Sheldon Solomon] Yes. The only solution in principle is, as Albert Camus put it, he said, "There's only one liberty, to come to terms with death, thereafter anything is possible." I find that downright inspiring. |   |
| 52:25 - [Jeff] As for our environmental leaders, who dwell in comfortable illusions, how tragic of decisions were they capable of making? I was about to find out. |   |
| 52:38 (humming of machinery) (leaves crunching) |   |
| 52:51 - [Josh Schlossberg, Energy Justice Network] They claim they're just using forest residues, but actually a great deal of what the McNeil facility, and lots of biomass facilities burn, is whole trees. As you can see by this pile that's stacked right outside of the facility, these are trees. |   |
| 53:06 - [Jeff] It turns out that the biggest source of green energy in Vermont is something called biomass. Burning trees to create electricity. |   |
| 53:16 - [Josh Schlossberg] This is definitely not the way. At the first step is actually looking at our lifestyles, how we can reduce our energy consumption. This is all the ash that has varying levels of toxic metals, a great deal of radiation because these trees have been absorb... Oops, there's the... |   |
| 53:35 (machinery humming) |   |
| 53:38 - [Security] You're in unforbidden territory there. |   |
| 53:40 - [Jeff] Are we? |   |
| 53:41 - [Security] May I ask both of you to come up to our office, okay. |   |
| 53:44 - [Josh Schlossberg] Is that something you're interested in doing? |   |
| 53:45 - [Security] It's not an interest, you've got five seconds or I'm calling 911. |   |
| 53:49 - [Jeff] Okay. |   |
| 53:49 - [Security Guard] We've got two individuals here-- |   |
| 53:53 (loud crunching footsteps) |   |
| 53:54 [Security] Police will be down here in about two minutes. |   |
| 53:56 - [Josh Schlossberg] You asked us to leave and we're doing so. |   |
| 53:57 - [Security Guard] I'm not asking you to leave. I'm asking you to come up to the office. |   |
| 54:01 - [Josh] Okay, thanks for the offer. Maybe next time. (electronic beeping) (machinery humming) You got everything here. You have the number one polluter in the state that people think, and it's magical fairy dust from the smokestack. Reality is what you have is a facility that burns 400,000 green tons a year of trees. This facility burns thirty cords of wood per hour. |   |
| 54:25 - [Jeff] That's a hell of lot of wood. |   |
| 54:26 - [Josh] And on top of that, it actually burns natural gas, as well. |   |
| 54:30 - [Jeff] And to think you would have to have 10 of these to replace one average coal-fired power plant. It's just not gonna work. |   |
| 54:36 - [Josh Schlossberg] It's just nuts. It takes great deal of fossil fuels to cut down all these trees, to truck 'em in, to use the big machinery to dump the wood chips everywhere. So, the idea that somehow this is not anything to do with fossil fuels just doesn't even make any sense. It couldn't happen without fossil fuels, in fact. |   |
| 54:53 - [Jeff] How did the environmental groups get pulled into this? |   |
| 54:56 - [Josh Schlossberg] Obviously, the main factor is delusion. A lot of these environmental groups have been saying that all we have to do is, for instance, switch our fossil fuel economy over to a few solar panels and windmills, and we can continue living life as normal. Some of the environmental groups have been, for years, touting facilities like this saying that, number one, it's carbon neutral. That this will actually help us fend off climate change because there are no CO2 emissions. |   |
| 55:27 [Josh Schlossberg] It actually emits over 400 thousand tons per year of carbon dioxide. Oh, but once we but them, they'll grow back. They'll grow back over a period of decades to centuries. We cut every tree in the United States, it would be able to power the country for a year. Then what happens when those trees are gone? |   |
| 55:49 (wind blowing) |   |
| 55:53 - [Jeff] I discovered biomass plants were not even always biomass plants. |   |
| 55:58 - [Catherine Andrews, Citizen Activist] It's actually a solid waste incinerator that's posing as a biomass plant. The impact in this community is severe. The plant is right next Head Start school for preschool kids. There is Green Hill Manor and that's an assisted living senior residence. And there's also a Catholic elementary school right next door. |   |
| 56:24 - [Jeff] How do you know they're polluting? Can you see it ever? |   |
| 56:26 - [Catherine Andrews] We can see it. The snow at the elementary school and at the preschool is covered with black, some kind of black soot. We just had it analyzed and it came back as mostly tire chips. They have to add tire-derived fuel to raise the temperature of the fire, because anybody whose tried to burn green wood or wet wood, knows that it doesn't burn very well. |   |
| 56:56 - [Jeff] But this biomass plant had yet another surprise. |   |
| 57:00 - [Catherine Andrews] They admit that they burn 20.1 tons per hour of creosote treated railroad ties. Besides that, they are allowed to burn 500 pounds per hour of PCP treated railroad ties. These are shipped in from Canada. It's not green, it's not renewable, it's not carbon-neutral, it's not anything that they claim it to be. Yet, they got $11.5 million grant because it was classified as renewable. |   |
| 57:31 [Catherine Andrews] The plant owner told us that they were having trouble getting enough wood chips. And he even asked us if we had any scrap wood where we lived, would we call the plant and let them know so they could come up and pick it up. |   |
| 57:47 - [Jeff] We're not talking about some old industrial site, we're next to one of the most beautiful places in the world. |   |
| 57:52 - [Catherine Andrews] We re next to Lake Superior, this is Keweenaw B... This is actually L'Anse Bay, it's part of Keweenaw Bay. It's Lake Superior, our lake. (voice breaking) So, it's a very sacred place to many people. |   |
| 58:12 (clopping horse feet) |   |
| 58:13 - [Passerby] Are you with the news? |   |
| 58:15 - [Jeff] No, there's supposed to be a climate change rally. |   |
| 58:17 - Oh. |   |
| 58:18 - (group chanting) |   |
| 58:22 - [Jeff] Michigan State University students, inspired by 350.org, were holding a rally for the clean energy future they'd been promised. |   |
| 58:31 - (crowd shouting and cheering) |   |
| 58:36 - [Student] Imagine when I found out that it is the largest on-campus coal plant in the nation. The goal is to get the whole world moving beyond fossil fuels. |   |
| 58:45 (crowd cheering and clapping) |   |
| 58:47 - [Student] Who wants to do a 350 sign on the steps?" |   |
| 58:51 - [Jeff] But it turned out Michigan State had a form of green energy in mind the students did not support. |   |
| 58:58 - [Adam Liter, MSU Student] The university contracted with a energy contracting company. They put together a modeling tool. First two or three months that the steering committee was using this modeling tool, it didn't even contain data for wind or solar. So there was (voice fading out) |   |
| 59:12 - [Jeff] Adam told me they were planning on substituting coal burning with biomass burning. |   |
| 59:16 - [Adam] But the permit that is currently being considered by the state is a permit for 24,000 tons of biomass, I think per year. And the plan is to do that in all four boilers. Unfortunately, the steering committee considers biomass renewable at the moment. Which we're not happy with. |   |
| 59:35 (students laughing) |   |
| 59:36 - [Jeff] Michigan State wasn't the only university to go green. |   |
| 59:41 - [University spokesman] I'm happy to announce that Carolina will be going beyond coal in the next decade. Now, as we begin to wean ourselves on coal, we are about to try another alternative energy source, biomass. |   |
| 59:54 - [Jeff] And who was here to help the University of North Carolina switch from burning coal to burning trees? |   |
| 60:01 - [Bruce Nilles, Director, Sierra Club 'Beyond Coal'] So, it is a great pleasure to be here today to celebrate the remarkable step that the university is taking to say, "We're gonna do our part." |   |
| 60:09 (solemn music) |   |
| 60:10 - [Jeff] A remarkable step, indeed. We're to do our part by getting out of bed with coal companies and into bed with logging companies? Where did the idea of colleges going green by burning trees come from, anyway? A little college called Middlebury in the heart of Vermont. |   |
| 60:32 - Welcome to the celebration of the opening of Middlebury's new biomass gasification system. |   |
| 60:38 [Middlebury Spokesman] It's now my great pleasure to introduce this afternoon's speaker, Bill McKibben. |   |
| 60:43 (audience clapping) |   |
| 60:44 - [McKibben] What powers a learning community? And as of this afternoon, the easy answer to that is wood chips. It's incredibly beautiful to stand over there and see that big bunker full of wood chips. You can put any kind of wood in, oak, willow, whatever you want. Pretty much anything that burns, we can toss in there if we can chip it down to the right size. And there are very few similar cases anyplace in this country of that kind of change over that scale. But it shows it could happen anywhere and it should happen anywhere. In fact, it must happen everywhere. |   |
| 61:21 - [Jeff] It must happen everywhere. And now it's time for a nature break. Enjoying our sustainably managed Michigan forests. |   |
| 61:31 (classical piano music) |   |
| 61:32 - [Man] If you walk through here and you look, there's virtually nothing growing. A little bit of grass occasionally. |   |
| 61:39 (increasing classical music) |   |
| 61:40 - [Jeff] And it seemed that biomass plants, indeed, were suddenly everywhere, like this one in Cadillac, Michigan. |   |
| 61:47 (truck engine rumbling) |   |
| 61:49 [Jeff] In Detroit, an incinerator that burned garbage was considered green. |   |
| 61:53 (classical piano music) |   |
| 61:55 - [News Anchor] The Detroit incinerator is known to emit horrible smells and pollutants that neighbors say make them feel sick and put their health at risk. |   |
| 62:02 - [Resident] It's a stink, it's a horrendous stink. |   |
| 62:05 - [Jeff] A proposed biofuel plant for the Upper Peninsula of Michigan would consume trees from tens of thousands of square miles. |   |
| 62:12 - [Pat Egan, Local Timberland Owner] In order to create 40 million gallons of ethanol, they are going to have to use up over a million tons of green wood. We pointed out that they were gonna be using more natural gas than they were gonna be creating ethanol to displace the natural gas. If you continue to do this, you're gonna be fertilizing the forest. |   |
| 62:29 - [Jeff] Fertilizing forests with? Fossil fuels? |   |
| 62:30 - [Pat Egan] Fossil fuel based fertilizers. |   |
| 62:33 - [Jeff] Made from natural gas? |   |
| 62:34 - [Pat Egan] Yeah. |   |
| 62:35 (frenzied piano music) |   |
| 62:36 [Jeff] Then came a ballot proposal backed by Bill McKibben and nearly every major environmental group, requiring Michigan to get 25% of its electricity from renewable sources by the year 2025. |   |
| 62:48 - [News Anchor] This year, Michigan voters have a choice: keep burning dirty coal and oil or move Michigan to clean, renewable energy like wind and solar. Vote yes on Proposal three. |   |
| 62:59 - [Jeff] Surprisingly, Proposal three, also known as 25 by 25, was the brain child of an organization that was 100% biofuels and biomass. |   |
| 63:11 - [Read Smith, Co-Chair, 25x'25 Steering Committee] Allowing America's farms, ranches and forest lands to be active participants in contributing to America's energy future. |   |
| 63:18 - [Jeff] These are the biomass and biofuel plants across the U.S. How did this happen? And it wasn't just the U.S.A. It was all around the world. Wood chips, which is just a euphemism for trees, are being exported to Europe from America, British Columbia, Brazil and Indonesia. Wherever they can get them from. |   |
| 63:48 (classical piano music) |   |
| 63:49 [Jeff] Biomass, especially when you add in biofuels, is by far the largest portion of green energy around the world, even in Germany, source of the solar miracle. But maybe I was missing something. Maybe I had it all wrong. |   |
| 64:07 (woman's voice on loudspeaker) |   |
| 64:09 [Jeff] I decided to ask people protesting fossil fuels how they felt about biomass and biofuels as green energy. Would you say we don't need to do biofuels and food and forests for energy? |   |
| 64:20 - [Protester] No, no, definitely not. Of course not, of course not. |   |
| 64:23 - [Protester 2] Burning biomass, any kind of combustion, is something we just need to move away from. |   |
| 64:28 - [Protester 3] The more trees we have, the better. |   |
| 64:29 - [Protester 4] A lot of that didn't grow overnight. If we cut it down, we don't know the impact of that. |   |
| 64:32 - [Jeff] You're here as an oak tree? |   |
| 64:33 - [Man dressed as Tree] Yes. |   |
| 64:34 - [Jeff] If I had a chainsaw, that wouldn't be saving the planet, would it? |   |
| 64:36 - [Tree] No, it's painful. It's a painful way to go. I can tell you that right now. |   |
| 64:39 - [Jeff] It would take you a while to regrow. |   |
| 64:41 (laughing) |   |
| 64:42 - [tree] Yeah, oh yeah. But it wouldn't be me, it'd be an off-spring. |   |
| 64:45 - [Protester 5] With so many people doing it on such a massive scale, all of a sudden at once, that's pretty serious. |   |
| 64:52 - [Protester 6] No, I think we should not be burning trees. |   |
| 64:54 - [Group] No, no. |   |
| 64:56 - Why would we cut down trees? |   |
| 64:57 - We shouldn't replace one terrible way of getting energy with another terrible way of getting energy. Because it's one thing. |   |
| 65:03 (girl's voice fading) |   |
| 65:04 - [Jeff] Clearly, most citizens are opposed to biomass and biofuels. But what about environmental leaders? At times, they have promoted biomass but other times, they sound like they are against biomass. Like this Sierra Club policy, "We are deeply concerned about the implications of wood-to-energy for native forests." Or this statement signed on by 75 environmental groups, "Burning forests for energy will destroy one of our best defenses against climate change." But then again, their language leaves loopholes that enable biomass. The NRDC says you must use the "right types of biomass." The Dogwood Alliance says maybe small biomass plants are okay. And the Sierra Club flat out states, "Biomass can be sustainable." |   |
| 65:58 (pensive guitar music) |   |
| 66:00 [Jeff] Which side are they really on? I thought for sure with the camera rolling, environmental leaders would speak for the trees. |   |
| 66:07 - [Group] No frackin' way. Where's the science, where's the science? |   |
| 66:14 - [Speaker] We're here to tell a story about what the forests of this state, of our commonwealth, mean to us. |   |
| 66:22 - [Jeff] Does your organization have any stance on that? |   |
| 66:24 - [Spokesman] I'm not sure I would say we support it as much as we can wrap our heads around it. We've almost made a peace with the timber industry. |   |
| 66:32 - [Jeff] I'm just curious, what's your group stance on using forests for biomass? |   |
| 66:37 - [Spokesman 2] Biomass is renewable, biomass is sustainable. |   |
| 66:42 - [Spokesman 3] And I'm with Clean Water Action, we don't really have a stand on it.\ If the director of the Sierra Club was here, she'd be able to talk your ear off about it. |   |
| 66:55 - [Spokeswoman] I'm the director for the Sierra Club in Pennsylvania. |   |
| 66:59 - [Jeff] Does the Sierra Club support or not support biomass? |   |
| 67:05 - [Spokeswoman] I'm not totally prepared to talk about our policy on biomass today. Our position is somewhat nuanced, so I just want to be careful not to... |   |
| 67:14 (crowd talking) |   |
| 67:16 - [Jeff] So, you're with 350? |   |
| 67:17 - [Man wearing 350 shirt] I am. |   |
| 67:18 - [Jeff] Do 350 have a position on biomass |   |
| 67:20 [Man] 'cause I'm kind of actually--can't really speak for 350. |   |
| 67:23 - [Jeff] Do you personally have an opinion about whether we should be burning green trees for green energy? |   |
| 67:28 - No, I don't have an opinion on that. I like a fire. (laughing) |   |
| 67:33 - [Jeff] One of my biggest concern as an environmentalist is that we're trying to burn trees. There are tree burning power plants. Are you aware of the problems with biomass or biofuels? |   |
| 67:40 - Van Jones] Yeah, yeah, I'm not as aware of that as I could be or should be. |   |
| 67:45 - Jeff Gibbs, working on a documentary. In Michigan where I live, where I'm from, there's large plants that burn trees for energy and pretty much whole trees chopped up. Do you have a thought about whether that should be a part of green energy or not? |   |
| 67:57 - [Robert F. Kennedy Jr.] The great thing about green energy is you don't have to pick a favorite. |   |
| 68:00 - Jeff Gibbs. |   |
| 68:01 - Oh, hello. |   |
| 68:02 - [Jeff] My biggest concern is that in Germany, for instance, they're moving toward solar and wind but 60% of their actual energy is coming from biomass. 60% of what's considered renewable energy. Burning trees for energy? |   |
| 68:13 - [Bill McKibben] I don't know the details out of Germany. What Germany's really doing is a lot of sun related and that's really powerful to see. |   |
| 68:20 - [Jeff] I'd like to see us come out against any burning of trees. |   |
| 68:22 - [McKibben] All right, well go and do it. |   |
| 68:23 - [Jeff] For clean energy. Would you? |   |
| 68:25 - [McKibben] Although I confess I stoke my wood stove almost every night of the winter, so I'm not really the right person to ask. |   |
| 68:30 - [Jeff] But designating green energy for power plants. |   |
| 68:32 - [McKibben] Yeah, yeah, I don't know. It's not what this day's about. |   |
| 68:36 - [Jeff] But if we're burning trees instead of fossil fuels. |   |
| 68:41 - (crowd drowns out) from Taiwan. |   |
| 68:42 - [McKibben] Oh, good. |   |
| 68:44 - [Questioner] We're wondering what role do you want to play in this (voice fading out)? |   |
| 68:48 - [Jeff] I think the biomass question's a non-starter. I found only one environmental leader willing to reject biomass and biofuels. |   |
| 69:02 - [Vandana Shiva] So we are talking of the old oil economy trying to maintain itself now through another raw material, the green planet. The only reason corn and soy has been planted for biofuel in this country is the subsidies make it profitable. I think the big crisis of our time is our minds have been manipulated to give power to illusions. We shifted to measuring growth, not in terms of how life is enriched but in terms of how life is destroyed. |   |
| 69:36 (peaceful guitar) |   |
| 69:39 - [Jeff] Her honesty was refreshing. But as for the rest of them, I wondered, what are they hiding? And why are they hiding it? Is it their ignorance? Or is it something else? |   |
| 69:59 (music increasing in tempo) |   |
| 70:01 [Jeff] What if they, themselves, had become misguided? What if they've made some kind of deal they shouldn't have made? And are leading us all off the cliff? |   |
| 70:18 (light upbeat music) |   |
| 70:22 [Jeff] It was long past time for me to come to grips with the other elephant in the living room. The profit motive. The only reason we've been force fed the story, climate change plus renewables equals we're saved, is because billionaires, bankers and corporations profit from it. And the reason we're not talking about over-population, consumption and the suicide of economic growth is that would be bad for business. Especially the cancerous form of capitalism that rules the world. Now hiding under a cover of green. |   |
| 71:00 - [Bloomberg] Today Bloomberg Philanthropies is making, I'm happy to announce, a new investment of $30 million in the Beyond Coal campaign. |   |
| 71:08 (crowd cheering and clapping) |   |
| 71:11 [Bloomberg] We have more. I'm glad to say that more than a dozen additional funders have committed to match that $30 million. |   |
| 71:17 (clapping and cheering) |   |
| 71:20 - [Jeff] And who were these new partners? One of them was Jeremy Grantham. Billionaire, world's leading timber investment advisor. They were not investing in trees to turn them into nature preserves. Which might answer another riddle, why is this name redacted on the Sierra Club's tax return? Would they be embarrassed to take three million dollars from a man who made his living selling the forest to the world? |   |
| 71:49 [Jeff] Bloomberg, bringing a timber investment billionaire to the party, was no coincidence. Bloomberg sponsored a U.N. climate session to discuss wrapping up biomass and biofuels around the world. Billionaires were in love with the idea of turning what was left of nature into green profits. Remember when Al Gore had gotten Richard Branson to invest billions into saving the planet? |   |
| 72:15 - [News Anchor] Richard Branson, founder of Virgin Atlantic, powered a Boeing 747 from London to Amsterdam on a coconut oil mixture to highlight the potential of this amazing oil as a clean energy biofuel. |   |
| 72:28 - [Jeff] Branson had actually invested in biofuels. He was attempting to replace the jet fuel damaging the planet with biofuels that required the consumption of the living planet. And it was game-on for the airline industry. |   |
| 72:42 - [News Anchor] Dozens of researchers from all over the northwest gathered in Missoula the past two days to explore the idea of converting the region's mass of reserves of wood into jet fuel. Especially with the demand for aircraft fuel expected to grow by a billion gallons in the northwest alone. |   |
| 72:55 - [News Anchor] United Airlines will buy a $30 million stake in biofuel company, Fulcrum BioEnergy. The airline used 3.9 billion gallons of fuel last year. |   |
| 73:06 - [Jeff] What technology was Silicon Valley billionaire Vinod Khosla hoping to profit from? |   |
| 73:12 - [Vinod Khosla] Nature takes a million years to produce our crude oil. KiOR can produce it in seconds. |   |
| 73:18 - [Lesley Stahl, 60 Minutes] The company took over this old paper mill where logs are picked up by a giant claw, dropped into a shredder and pulverized into wood chips. Clean gasoline? |   |
| 73:29 - [Vinod Khosla] Clean, green gasoline. |   |
| 73:31 - [Lesley] There must be a downside. |   |
| 73:33 - [Vinod Khosla] There is no downside. |   |
| 73:35 - [Jeff] The bank that crashed the economy, ruined millions of lives and has their tentacles on the levers of power, what would their favorite form of green energy be? |   |
| 73:45 - [Goldman Sachs] One of the very interesting markets that we deal with is Brazil. It's unlike any other market in that today, alternative energy isn't really alternative energy. It's so much a part of the fabric of the society. The country began to utilize its vast resources of sugar cane to produce ethanol. |   |
| 74:03 - [Jeff] There was a man from Goldman Sachs who was particularly in love with turning forests into profits. |   |
| 74:09 - [David Blood] Has everybody got enough coffee? Might want to get some more. |   |
| 74:14 - [Jeff] Meet David Blood, former CEO of Asset Management for Goldman Sachs. How much money did Mr. Blood believe should be invested in green energy? |   |
| 74:24 - [David Blood] A natural alignment for something in the order of $40-50 trillion worth of capital. |   |
| 74:31 - [Jeff] $40-50 trillion. And who was going to help the man from Goldman Sachs? Help him raise that astronomical amount of money? |   |
| 74:41 - [Host] A gentleman some of you may recognize and know, Bill McKibben. |   |
| 74:45 - [McKibben] It's entirely dependent on what kind of political will we can muster. And if we do not get this done very fast, then we're not gonna get it done. |   |
| 74:57 - [Jeff] And so Bill McKibben went forth to generate the political will for trillions of dollars in green investments. |   |
| 75:04 - [David Letterman] Our next guest has been called our nation's leading environmentalist. |   |
| 75:07 - [Host] And you are, in some sense, the Grand Poobah of the environmental movement. |   |
| 75:11 - [Cobert] My guest tonight is on a global crusade. |   |
| 75:16 - [Jeff] On a global crusade for what? |   |
| 75:18 - [McKibben] Commit to divesting from fossil fuels. We can't justify investing our money into companies that are basically running genesis backward. |   |
| 75:26 - [Jeff] So when you divest from fossil fuels, and invest in green funds, what are you investing in? I took a deep dive into Securities and Exchange Commission filings to find out. For instance, in the Green Century Funds, recommended by 350.org and Bill McKibben, I found less than one percent solar and wind and 99% things like mining, oil and gas infrastructure companies, including a tar sands exploiter, McDonald's one of the companies driving meat consumption across the planet. Archer Daniels Midland, one of the world's largest producers of biofuel, Coca Cola, the largest creator of plastic pollution on earth, logging and paper companies including one that brags about biomass burning and banks. |   |
| 76:32 (dramatic music) |   |
| 76:34 [Jeff] Lots of banks. Including BlackRock, the largest financer of deforestation on earth. |   |
| 76:44 - [Woman] The business that they're engaged in is actually destroying our life support system. |   |
| 76:49 (dramatic music) |   |
| 76:51 - [Jeff] The Sierra Club, also partners with a green fund called Aspiration. Aspiration also includes dozens of companies profiting from the destruction of the planet. Including Chevron, ExxonMobil, Chesapeake Energy. |   |
| 77:10 - [Announcer] In order to maximize the production potential of the well, the shale formation will be hydraulically fractured. |   |
| 77:17 - [Jeff] The Russian gas giant, Gazprom. |   |
| 77:20 - [Announcer] Gazprom owns the world's largest explored gas reserves, 36 trillion cubic meters. |   |
| 77:27 - [Jeff] And in perhaps the most bizarre twist of all, the Sierra Club's green fund's biggest holding is in Viva, the world's largest consumer of forests, to be incinerated in green energy biomass plants. Of course, one investment option is a green fund, run by Bill McKibben's buddy, David Blood. And who was the chairman of this fund? Someone familiar. |   |
| 77:58 - [Al Gore] Use capitalism, it gives incentives for people to do their best. |   |
| 78:04 - [Jeff] Al Gore and David Blood partnered to form a company called Blood and Gore. No, scratch that, Generation Investment Management. And within this fund, Blood and Gore designated a special investment category targeting $650 million of biomass and biofuels. Funny thing was, they partnered before Al Gore's film came out. Was that movie just about climate change or something else? |   |
| 78:38 - [Al Gore] On one side, we have gold bars. Mm, mm, mm. (audience laughing) Don't they look good? I'd just like to have some of those gold bars. On the other side of the scales, the entire planet. (audience laughing) If we do the right thing, then we're gonna create a lot of wealth. |   |
| 79:00 - [Jeff] And when it came time for Al Gore to choose between the entire planet and getting him some of them gold bars, what choice did he make? Here's Al Gore earning his keep by pretending to care about the rain forest while lobbying Congress on behalf of the sugar cane ethanol industry. |   |
| 79:20 - [Mr. Dodd, Global Climate Change, Senate Foreign Relations Committee] Let me come in on the Brazilian effort here with the issue of the possibility of expanding into that Amazon River basin with further deforestation to produce more ethanol out of sugar cane is a worry. And apparently you're not as concerned about that. |   |
| 79:31 - [Al Gore] No, no, I am, I simply forgot. (motor roaring) (children screaming & crying) What's been going on there, it is really very troubling. |   |
| 79:43 (speaking in foreign language) |   |
| 79:48 [Al Gore] And with your permission, I'll show you a very quick example of it over a period of 25 years. |   |
| 79:55 (loud tapping) |   |
| 79:59 - [Announcer] The invasion of sugar cane on the cultures in the region clashes with the indigenous people's right to land. These are images of a last ditch attempt by the Guarani-Kaiowá to resist eviction. |   |
| 80:10 - [Al Gore] Important to note that the exploitation of the sugar cane growing areas in Brazil does not have to inevitably have the knock on consequence of causing destruction in the Amazon. |   |
| 80:28 - [Announcer] Sugar cane fields are burning. They're set alight before the harvest to eliminate the leaves and tops of the plant, which makes cutting more efficient. Environmentalists blame the seemingly endless sugar cane fields, the air and water pollution on an epic scale. And along with deforestation, the threat it poses to the environment is becoming clear. Once the indigenous families were expelled, the land owners set their homes on fire. |   |
| 81:01 (dramatic music) |   |
| 81:06 - [Jeff] Is there anything too terrible to qualify as green energy? |   |
| 81:11 - [Richard Branson] Thank you very much, Secretary Mabus and U.S. Navy for, once again, inviting me to speak with you today. The Navy's work to help launch this new fuel industry is invaluable. |   |
| 81:22 (roaring plane engine) |   |
| 81:24 - [Announcer] The U.S. Navy has a special message this year. It is time to turn green. Joining the vessels is what the U.S. Navy calls, it's great green fleet of warships, powered by fuel from renewable sources like algae, grass and animal fat. |   |
| 81:39 - [Jeff] Animal fat? |   |
| 81:42 (thudding and pounding) |   |
| 81:48 - [News Anchor] The next time you fill up at your neighborhood gas station, you might find yourself pumping a little alligator into your tank. That's right, U.L. Lafayette researchers have developed alligator fat into a renewable source for biofuels. |   |
| 82:04 - [Jeff] And once we run through the animals, what's next? GE, who brings you nuclear energy and wind turbines, is ready with a plan. |   |
| 82:15 - [Spokesman] I believe that liquid fuels, chemicals, are eventually gonna have to be made from sustainable raw materials. We believe that seaweed is one of the most attractive opportunities. |   |
| 82:29 (majestic music) |   |
| 82:39 - [Jeff] Better hurry. One year after it was filmed, the seaweed forest was dead. You might ask yourself, how could men destroy what remains of nature to enrich themselves? Well, that's why they're billionaires and you're not. |   |
| 83:06 (laughing) |   |
| 83:10 [Jeff] The takeover of the environmental movement by capitalism is now complete. Environmentalists are no longer resisting those with a profit motive, but collaborating with them. The Nature Conservancy is now the logging conservancy. |   |
| 83:25 - [Michael Carr, Executive Director Adirondack Chapter, Nature Conservancy] We will capture the most important pieces biologically\ and there will be another large block sold to timber investment groups. |   |
| 83:34 [Jeff] The Union of Concerned Scientists has become the union of concerned salesmen, having taken millions, not for science, but to create markets for electric cars. The Sierra Club sells electric cars and solar panels right from their website. |   |
| 83:53 - [Michael Brune] The best thing about Sungevity is that they make it easy for you. All that you have to do is to say yes. |   |
| 84:00 - [Jeff] The New York Times partners with ExxonMobil to bring you the good news about biofuels. |   |
| 84:05 - [Announcer] Algae derived fuel could help us meet growing demands. |   |
| 84:09 - [Jeff] Treehugger.com, which claims to be the largest single source of environmental news, was founded and funded by Georgia Pacific, a logging company. In fact, they are neighbors. Georgia Pacific is owned by our friends, the Koch brothers, who are likely the largest recipient of green energy biomass subsidies in the United States. Yes, the merger of environmentalism and capitalism is now complete. But maybe it's always been complete. |   |
| 84:42 - [Karyn Strickler, Journalist] How is 350.org funded? |   |
| 84:45 - [Bill McKibben] Well, not very well. |   |
| 84:46 - [Karyn] (laughing) Who are your funders? |   |
| 84:49 - [McKibben] To the degree that we have any money at all, it's come from a few foundations in Europe and U.S. |   |
| 84:53 - [Karyn] Which ones? |   |
| 84:55 - [McKibben] Ah, let's see. The, I'm trying to think who the biggest funders are. There's a foundation in, based in Sweden called, I think it's called the Rasmuson Foundation that I think has been the biggest funder. |   |
| 85:18 - [Karyn] So you don't get money from Pew or Rockefeller or any of those big foundations? |   |
| 85:22 - [Bill McKibben] No, we did. Rockefeller Brothers Fund gave us some money right when we were starting out. That's been useful, too. |   |
| 85:29 - [Karyn] But they no longer fund you? |   |
| 85:31 - [McKibben] I don't know, I don't have this sort of- |   |
| 85:34 - [Karyn] (laughing) Really? |   |
| 85:36 - [McKibben] Funders sitting in front of me. |   |
| 85:38 - [Karyn] That's usually something that people know. |   |
| 85:40 - [McKibben] Rockefeller's been one of our, is one of our, is a great ally in this fight. |   |
| 85:46 - [Interviewer] You just sold your TV network to Al Jazeera. |   |
| 85:50 - [Al Gore] Right. |   |
| 85:51 - [Interviewer] And that government is basically nothing but an oil producer. |   |
| 85:54 - [Al Gore] Gas, mainly and oil. |   |
| 85:55 - [Interviewer] Your take on that, about a hundred million dollars pre-tax from a country that bases it's wealth on fossil fuels. Isn't there a bit of hypocrisy in that? |   |
| 86:05 - [Al Gore] Well, I get the criticism, I just disagree with it. I'm proud of the transactions. |   |
| 86:09 - [Jon Steward] You couldn't find, for your business, a more sustainable choice? |   |
| 86:15 - [Al Gore] What is not sustainable about it? |   |
| 86:16 - [Steward] Because it is backed by fossil fuel money. |   |
| 86:19 - [Al Gore] I get it, I get it, I get it. |   |
| 86:21 - [Jeff] And so, if you got yourself an environmental movement and environmental leaders, why not buy the holy day itself? |   |
| 86:28 - [Man] (crowd screaming) Happy Earth Day! |   |
| 86:30 ♪ Oh, oh, oh, oh, oh ♪ Oh, oh, oh, oh, oh ♪ |   |
| 86:35 ♪ You make me want to say Ah, you make me want to say ♪ |   |
| 86:42 - [Denis Hayes, Founder, Earth Day] Now we are facing the greatest sets of issues that we've seen in my lifetime. It's time now for a new generation to jump up on the stage and create a habitable country, a habitable planet, that we can all enjoy. Are you that generation? |   |
| 86:58 (crowd screaming and cheering) |   |
| 87:01 [Hayes] I need to thank Building Energy which provided so much solar power to this that we powered the entire event with solar energy. |   |
| 87:09 (crowd cheering and screaming) |   |
| 87:13 - [Jeff] But when I went backstage to see what was really going on. |   |
| 87:17 - [Backstage Tech] It ain't running this whole thing on that, Jack. I can tell you that. For a toaster is 1200 watts. So, that run right there could run a toaster. |   |
| 87:27 - [Jeff] I found the installer. |   |
| 87:29 - Hi. |   |
| 87:30 - [Jeff] Are they running the festival on these solar panels? |   |
| 87:33 - [Installer] The concert is run by diesel generation system. They didn't ask us to energize the concert. |   |
| 87:43 - [Jeff] Oh, okay. |   |
| 87:45 - [Hugh Evans, CEO, The Global Poverty Project] And we'd also like to thank our incredible corporate sponsors have been behind the movement to end extreme poverty and tackle climate change since the very beginning. I want to thank Toyota. (loud roaring engine) Citibank. (clanging bell and cheering) We want to thank Caterpillar. |   |
| 88:03 - [Amy Goodman, Democracy Now!] We're standing at the destruction site of the Dakota Access Pipeline. It looks like there are at least three bulldozers actually bulldozing the land. (group yelling and cheering) People have gotten through the fence, the bulldozers are still going (people screaming) and they're marching over the dirt mounds. |   |
| 88:24 (loud angry screaming) |   |
| 88:26 - [Man In Orange Shirt] Get the fuck off! Get the fuck out of here! |   |
| 88:28 - [Hugh Evans] Without these partners, it wouldn't be possible. Let's give them a round of applause, everyone. |   |
| 88:32 (crowd cheering and clapping) (slow solemn music) |   |
| 88:45 - [Jeff] Now I know this all might seem overwhelming. It's a kind of thing that we normally don't try and think about. But by not thinking about it, it stands a good chance of doing us in. I truly believe that the path to change comes from awareness. That awareness alone can begin to create the transformation. There is a way out of this. We humans must accept that infinite growth on a finite planet is suicide. We must accept that our human presence is already far beyond sustainability. And all that that implies. We must take control of our environmental movement and our future from billionaires and their permanent war on Planet Earth. They are not our friends. Less must be the new more and instead of climate change, we must at long last accept that it's not the carbon dioxide molecule destroying the planet, (slow solemn music) it's us. |   |
| 90:17 (slow solemn music) |   |
| 90:19 [Jeff] It's not one thing, but everything we humans are doing. A human-caused apocalypse. If we get ourselves under control, all things are possible. And if we don't.... |   |
| 90:39 (ominous music) (chainsaw buzzing) (crashing trees) (sad mournful music) (trees crashing) (slow solemn music) |   |
| 91:23 (trees scrapping) (orangutan chirping) |   |
| 91:33 ♪ Ah-Ooh ♪ (mournful orchestral music) (music fading) |   |
| 92:08 (snapping tree branch) (slow solemn music) (roaring crackling fire) |   |
| 92:31 ♪ Ah-Ah-Ooh Ooh-Ooh (increasing in intensity) ♪ |   |
| 92:46 ♪ Ah-Ooh ♪ (orangutan chirping) (female singing mournfully) |   |
| 93:05 (orangutan squealing) |   |
| 93:07 - Yeah, yeah, yeah. (low talking) ♪ Ah-Ah-Ah Oh-Oh-Ah Oh-Oh-Ah Ooh-Ah Oh-Oh-Oh Ooh ♪ |   |
| 93:54 (somber music) |   |

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### 'Humankind is challenged, as it has never been challenged before, to prove its maturity and its mastery—not of nature, but of itself.' —Rachel Carson, Silent Spring 1962