

Reading 6, Project Drawdown

Ok, let's say that we get serious about not only stopping the rise of global greenhouse (GHG) gasses, but getting to the point where these emissions are actually declining. How do we even begin such an undertaking? Specifically, what do we need to do? Install more wind turbines? More solar?

There are two ways of approaching this problem, one personal, one global. Let's start on a personal level, as we hear all sorts of solutions bandied about, from switching light bulbs to unplugging our phone chargers.

In his book [*Sustainable Energy — without the hot air*](#), the late David MacKay drew attention to the fact that the BBC News suggested that, as “[t]he nuclear power stations will all be switched off in a few years. How can we keep Britain's lights on? ... unplug your mobile-phone charger when it's not in use.” This is certainly a good thing to do, but, as MacKay aptly notes,

“Obsessively switching off the phone-charger is like bailing the Titanic with a teaspoon. Do switch it off, but please be aware how tiny a gesture it is. Let me put it this way: All the energy saved in switching off your charger for one day is used up in one second of car-driving.”

So, what then are the big offenders in terms of our individual climate footprints?

A few years ago the ever-reliable [Union of Concerned Scientists](#) put together a concise article on the subject that, among other things, explained where our primary personal emissions come from:

1) Housing can account for a third of your climate footprint, especially if you live in a large suburban or rural home. The main problems are heating, cooling, and home energy use.

2) Transportation. For the average American, owning and driving an automobile accounts for around a quarter of our individual climate footprints.

3) All the stuff that we buy, “from tangible items like clothes and furniture to services like haircuts and healthcare,” also amounts to around a quarter.

4) Finally, rounding out the big four, the production of our food also is responsible for an extraordinary greenhouse gas (GHG) emissions.

As I noted in a previous lecture, if you just addressed these issues (by getting rid of your car, living in efficient housing, and eating a largely plant-based diet and wasting less food), as well as reconsider your relationship to stuff, you could likely cut your climate footprint in half, perhaps even a good deal more.

Alternately, we can approach this issue globally, rather than personally. [Project Drawdown](#), which is arguably the “most comprehensive plan ever proposed to reverse global warming,” considered and ranked the “100 most substantive solutions to global warming.” If enacted, these solutions could not only halt the rise of GHGs, but actually drawdown these emissions.

While all of these solutions are needed, the top 25 are particularly noteworthy, especially as, taken together, the top three solutions would do more to drawdown global GHG emissions than the bottom 75 combined.

What is perhaps surprising is that many things that we might imagine would be in the top 25 are absent and, alternately, some that we may have never heard of top the list.

For example, we are often told that switching to energy-efficient lighting in our houses can make a meaningful difference in the climate crisis. While doing so is certainly important and can indeed make a difference, its relative importance needs to be taken into account, as globally reducing food waste can have nearly ten times the impact of switching to LED lightbulbs residentially.

Similarly, even though electric vehicles have taken on an iconic, almost savior-like status as a solution to the climate crisis, they are, at #23, near the bottom of the top-25 solutions, while the

#1 solution, reducing food waste, is rarely mentioned in the press – especially when compared to electric vehicles.

Perhaps surprisingly, the #1 thing that we can do to roll back global greenhouse gas emissions does not involve wind turbines, solar panels, electric vehicles, or any sort of similar technologies.

Instead, when taken together, wasting less food and eating a largely plant-based diet (#1 & 3 on the list) is bigger than anything else on the list at 152 gigatons of GHG emissions for the pair. This is considerably more than either wind or solar.

Food waste is the single largest producer of greenhouse gasses on the planet. Although many people have gotten the memo that switching to a largely plant-based diet would have profound climate consequences, food waste is a considerably larger issue that receives very little press.

Part of the problem is that we waste between 1/3 and 1/2 of the food that we produce. For Americans, much of this happens at the consumer level.

Let me repeat that to be clear, if we just stopped wasting food, we could cut the single largest greenhouse gas emissions problem on the planet nearly in half.

I know, this shift in diet doesn't sound nearly as glamorous as a self-driving electric car, but it would nonetheless be ten times better for the planet.

Similarly, the education of women and girls and family planning are together #2. Simply put, we need to educate more people with uteruses, as well as promote family planning (globally, there are roughly 85 million unintended pregnancies every year). These two things together would roll back 85 gigatons of GHG emissions.

Throughout the 20th century, there were large-scale efforts to reduce population. Perhaps the most famous was the one- (and two-) child policy in China during the closing quarter of the 20th century and the beginning of the 21st. [It has been argued that because of this policy](#), “provincial governments could, and did, require the use of contraception, abortion, and sterilization to ensure

compliance, and imposed enormous fines for violations.” For obvious reasons, these policies were exceptionally controversial, as well as being arguably ineffective.

We now know that there is a much simpler solution: educate people with uteruses, which dramatically curbs population growth, as the more education a person with a uterus has, the fewer children they have. No one has to force a person with a uterus to make this decision, as this is simply their choice.

This is not to say that we should place responsibility for this particular issue with girls and women. To the contrary, the responsibility lies with the institutions that restrict a woman’s access to education and control of her own body. And too, it is obviously the case that contraception is a male responsibility as well.

Why is population so important? Sixty years ago, the global population was about 3 billion. At the time of this recording, it is 7.75 billion. By 2050 it will be approaching 10 billion. The simple fact is that this many people are profoundly taxing the resources of our planet. Hence, reducing the population of our species is one of the main things that we can do to mitigate the climate crisis. But how, exactly, do we go about doing this?

So, in order, the top three solutions to the climate crisis are 1) reducing food waste, 2) educating women and girls and family planning, and 3) shifting to largely plant-based diets.

Taken together, these three cultural changes alone can take us nearly a quarter of the way to where we need to go to get GHG emissions under control. As I noted above, these three changes would do more to drawdown global GHG emissions than the bottom 75 things on the Project Drawdown list combined.

Note that very little is needed by way of technology here, as the necessary changes can be made right now by both individuals and a range of groups and institutions.

Note also that quite a few of the suggestions made by Project Drawdown involve land use, relating to tropical forests, silvopasture, regenerative agriculture, temperate forest, peatlands, and so forth. In fact, eleven of the top 25 things that we can do to draw down emissions involve land use of one sort or another.

Interestingly, nine of these eleven issues related to land use also involve food production. Hence, eleven of the top-25 things that we can do to draw down emissions involve food, if we add to this list reducing food waste and switching to largely plant-based diets.

It is worth pausing on this fact for a moment. If you happen to be looking for a career path that could make a major climate intervention, focusing on land use and food systems are (in light of the Project Drawdown data) an obvious choice.

In any event, while land use and food production dominate the top 25 “solutions” suggested by Project Drawdown, all-in-all, a diverse group of actions are required to draw down GHG emissions.

I am curious what you make of this compelling list of solutions to the climate crisis.

After all, this is what many, many people have been asking for: a roadmap to globally reducing our greenhouse gas emissions.

Class discussion of Project Drawdown

(Note that the following observations, which are in italics, have not been paraphrased or altered, though I do correct the occasional typo and, because of space concerns, often just part of the comment is reproduced here along with my reply. In working through these, I will first quote an observation by a student, followed by my thoughts.)

When I look through the website, and spoke to myself, “Yes! This is exactly what I want! Specific solutions to reduce personal carbon footprint.” I feel surprised by the various actions we can take to contribute to CO2 reduction, and I also enjoy reading it. To be honest, I prefer to read articles and websites that give people a specific way to solve problems or guide us to the same goal. I am not denying the significance of raising questions or discovering issues that already existed, but I am saying that reading materials that give people instructions can be more encouraging and hopeful. I grew up in China, and I am sure that our media is displaying advertisements about saving food, water, and electricity. However, it is not until the moment when I read this week’s reading then I know that there are even more things we can do.

Many, many people made comments similar to this one.

If you follow the news, you will hear about the climate crisis on a daily basis. You will hear about its disastrous impacts in the form of droughts, wildfires, hurricanes, and so forth. The political squabbling over the issue also receives a great deal of attention. And, of course, climate change deniers are also doing what they can to get in the news.

What is frustrating is that very little media attention is given to climate solutions. When it is, things like switching off your lights and unplugging your phone charger are often rolled out.

Which is why I think that Project Drawdown is so important, as it lays out solutions in order of their climate impact. Hence it is not surprising that this person exclaimed that “Yes! This is exactly what I want! Specific solutions to reduce personal carbon footprint.” And I hasten to add that these things can not only help us all reduce our personal carbon footprints, but also addresses changes that we can only make collectively, like installing offshore wind turbines.

This person makes another great point, as “reading materials that give people instructions can be more encouraging and hopeful” than “raising questions or discovering issues.” However, to get people to the position where people are ready to do something about the climate crisis, they need to be fully aware of the severity and enormity of the situation. This is why we spent a good bit of time looking at the problem.

In other words, if you are going to ask people to stop doing something that they enjoy, like eating beef, you better give them a good reason. For example (to borrow the word used by David Wallace-Wells), keeping our planet from becoming “uninhabitable” for

our species. Then, when people are, like this person, ready to roll up their sleeves and do something about the climate crisis, laying out the solutions in order can be, to again quote this person, “encouraging and hopeful.”

To state the obvious, when we can do something - anything - about a problem, it is generally far better than feeling helpless. This is arguably why Project Drawdown is, in addition to being a terrific roadmap to the future by laying out the top-100 things that we can do, “encouraging and hopeful.”

It is fabulous that we have these solutions in hand to solve the climate issues, but it is required from us and our government to implement these as quick as possible to save ourselves before sinking in the mud of desperation.

This comment makes two great points.

First, we really do indeed have the “solutions in hand to solve the climate” crisis.

Many people seem to be under the impression that, if we are to mitigate the climate crisis, we need a range of new and better technological solutions. There is some truth to this, as we do need to for example, work out how to make offshore wind turbines (#6 on the list) practical and economical. However, most of the top-100 (as well as the top-25) things that we can do to mitigate the crisis do not require a great deal of new technology.

Hence, technologically, there is nothing stopping us from jumping right in to solve this crisis.

So, what is standing in our way? As this person aptly and succinctly notes, what “is required from us and our government [is] to implement these [largely cultural changes] as quick as possible.”

In other words, the chief barrier standing in our way is us. If, individually and collectively, we resolved to solve this problem, I believe that we most definitely could. This leads to the next comment:

Disheartening is a good word to describe the Solutions list. Backed by governmental and political action, implementing many of these changes would be swift and effective...How impactful would this list be if it was widely made public knowledge. It is 100% frustrating and disheartening to come to the realization that our government chooses not to act in the interest of our well-being.

Two more great points.

First, effective communication and education is essential here. As this person succinctly notes, “[h]ow impactful would this list be if it was widely made public knowledge.” As we have seen, unfortunately, climate education at the K-12 and even university levels is

at best spotty. Moreover, the media is hardly doing an effective job at communicating solutions to the public.

Hence, many people absolutely want to do something (and would no doubt, feel much better if they were), but they just don't know where to begin or what to do.

Second, although the public may not necessarily know what to do, informed by experts and agencies like the EPA, government officials certainly have access to this knowledge. Nonetheless, as this person notes, "our government chooses not to act in the interest of our well-being," which is, as this person notes, "100% frustrating and disheartening."

So, what's the solution here? It's simple enough:

First, educate the public, as early as elementary school, about both the problem and solutions.

Second, vote in politicians who care about, to again quote this person, "our well-being" rather than the well-being of the fossil fuel industry and other corporations.

When I first looked at Project Drawdown, I assumed the list of solutions would be the things I have heard before. Things like you should eat less meat and you shouldn't drive your car. I did not expect to see so many new solutions. Education of women? As a woman, this is something I have been passionate about ever since Malala was shot for going to school.

Many people commented that they discovered all sorts of new solutions on the list that had never occurred to them. After all, most people have never heard of Silvopasture, Tree Intercropping, Regenerative Annual Cropping, and so forth. This turns back on the question of communication and education, as it is startling that these solutions are not better known. (I should confess that a number of things on the list were, in fact, new to me too.)

As this person notes, Malala Yousafzai, who is a Pakistani activist advocating for women's rights, was, indeed, "shot for going to school" when she was fifteen years old. Astonishingly, she survived the assassination attempt after undergoing a range of operations.

Although obviously an extreme example, it makes clear that what is seemingly a simple solution, providing education for girls and women - which is not only good for the climate, but for women across the planet - can sometimes be met with fierce opposition. The same is obviously true with giving women access to contraception, which is resisted across the planet, including in the United States - as the following comment makes clear.

The most interesting solutions I read about were "Educating Girls" & "Family Planning." According to Project Drawdown, 225 million women in lower income countries say they want the ability to choose whether or when to become pregnant but they lack access to necessary contraceptives. Also, there are 62 million girls around the world that are not able to access an

education because of economic, cultural, and safety related barriers. As a female and a Latina living in the US, I sometimes forget how hard people before me fought for someone like me to get an education. Still, there are girls all around the world that are not given the opportunity to get an education.

Across the planet, hundreds of millions of women want, but are denied, access to education and contraception. That's too mild a way of putting it: these women *need* access to education and contraception. Not only would they benefit, but so would the planet.

As this person aptly noted, "people before me fought for someone like me [a Latina living in the US.] to get an education." I would add that decades of activists also fought hard to give women in the US. access to contraception and, as a last resort, abortion.

There are two things to note here:

First, the problem here is not with women, as hundreds of millions of women clearly know what they want (i.e. education and contraception), but rather, as I noted in my introduction, with the institutions that restrict a woman's access to education and control of her own body.

Second, if you were under the impression that we were going to need to largely address the climate crisis through the deployment of new and expensive technology, such as offshore wind turbines, you may have found it heartening that the health and education of women is #2 on the Project Drawdown list.

After all, giving women access to contraception is quick, easy, and inexpensive. Moreover, [studies have shown](#) that the cost of educating women is deferred by the fact that, by entering the workforce, they greatly add to the economic health of a country.

In short, as there is no need to wait for a new technology or to spend a fortune on infrastructure, this is something that we can jump right in and do. What's stopping us?

As it turns out, quite a bit. Giving women access to education and contraception has been fiercely fought across the planet for hundreds of years now.

Hence, this is a situation that will not be easy to remedy. It may well be easier to install offshore wind turbines across the planet.

Nonetheless, thinking back on this comment, what is now needed is a new generation of activists to fight for both women's rights and the planet. Proving once again that you do not need to be a climate scientist or a technology specialist to make a real difference in the climate crisis.

When I first checked out the site, I was a little confused but then became very amazed. It really is a roadmap, and it makes it so easy to tell how much each of these factors is contributing to our global emissions, how much investing in it costs and then how much it can save us.

This is a great point regarding the actual financial benefits that implementing these 100 changes can have. We are often told (often by politicians who receive funding from fossil fuel companies) that it would simply be too expensive to mitigate the climate crisis. For example, a number of Republican politicians have argued that the Green New Deal would cost \$93 trillion to implement. [Donald Trump rounded this number up to \\$100 trillion.](#)

However, as Project Drawdown makes clear, implementing the necessary changes could actually save us money - and lots of it.

Let's take Improved Clean Cookstoves (#9 on the list) as an example. As Project Drawdown notes, "[a]round the world, 3 billion people cook over open fires or on rudimentary stoves. The cooking fuels used by 40 percent of humanity are wood, charcoal, animal dung, crop residues, and coal. As these burn, often inside homes or in areas with limited ventilation, they release plumes of smoke and soot liable for 4.3 million premature deaths each year. Traditional cooking practices also produce 2 to 5 percent of annual greenhouse gas emissions worldwide."

What would it cost to solve this problem? Project Drawdown estimates \$129–264 billion. That's quite a bit of money.

But, what if we fail to spend this money, what then? It would cost us somewhere around \$2-4 trillion dollars. In other words, it would cost us around 10 to 20 times more if we do not act. Expressed another way, it would cost, as they say, just five or ten cents on the dollar if we address this problem now. I admit that I am no economist, but that seems like a terrific deal to me.

And, as with so many of these issues, addressing this problem would help reduce human suffering across the planet.

The fact that there are "4.3 million premature deaths each year" caused by breathing in this smoke and soot is really just the tip of the iceberg. [According to the WHO](#) (World Health Organization), those "3 billion people cook[ing] over open fires or on rudimentary stoves" suffer from a range of health issues, such as stroke, heart disease, obstructive pulmonary disease, and an increase in pneumonia. Indeed, "[c]lose to half of deaths due to pneumonia among children under 5 years of age are caused by particulate matter (soot) inhaled from household air pollution." "Exposure is particularly high among women and young children, who spend the most time near the domestic hearth."

So, not only would acting on this issue save us trillions (that's with a "T") of dollars, it could reduce human suffering worldwide, especially among women and young children.

It was great to finally see that among all the false theories surrounding climate change and global warming that there are still genuine climate scientists out there who still are fighting to get the real message about the climate crisis out to the public and make them more aware of what's truly going on in the world around them...It's because of well knowledgeable & well-respected climate scientists such as these that issues of climate change continue to surface and inspire new newer generations of people to rise up and tackle the climate crisis as a whole.

I could not agree more. I know that sometimes I am quick to shift from science and technology to cultural solutions; however, I too feel that we owe an enormous debt of thanks to climate scientists, especially as they frequently suffer attacks from climate change deniers.

It is not just that climate change scientists identified the problems being brought about by the greenhouse gasses that we have been emitting, they then set about to finding solutions. While Project Drawdown should be absolutely applauded for bringing all these solutions together into one place, they are really just aggregating the work of countless unsung scientists and researchers.

This is not to say that the job of mitigating the climate crisis should fall to climate scientists. They have done wonderful work in identifying the problem and coming up with solutions.

However, it is up to us, individually and collectively, to implement those solutions.

As Ken pointed out, 11/25 solutions are related to land use and food. This just shows how important it is for us to monitor and regulate what we are consuming and how our food is getting on to our plates. Restorative, regenerative, and conservation agriculture are the three most important ways farmers should shift to reduce CO2 emissions. ...Most of the solutions, however, are not things that I can do personally right now. I cannot switch to wind power, solar power, or nuclear power when I am currently living on campus. I also cannot implement agricultural practices or improve my rice cultivation methods. It is a little frustrating knowing that it is up to the people in power and control of our energy and agricultural industries.

This is such a good point, as none of us can improve “rice cultivation methods” ourselves.

In his book [*Meatonomics: How the Rigged Economics of Meat and Dairy Make You Consume Too Much*](#), David Robinson Simon argues that “A \$5 Big Mac would cost \$13 if the retail price included hidden expenses that meat producers offload onto society. Animal food producers impose \$414 billion in hidden costs on American society yearly. These are the bills for healthcare, subsidies, environmental damage, and other items related to producing and consuming meat and dairy. That means that each time McDonald's sells a Big Mac, the rest of us pay \$8 in hidden costs.”

The simple fact is that the US. government provides enormous subsidies for the agricultural sector, but virtually none of it goes to mitigating the climate crisis. In fact,

since most of it goes to the beef and cattle industry, US. tax dollars are actually supporting a prime driver of climate change. (How frustrating is that?)

So, while we can personally switch to a plant-based diet, doing so will not bring about the necessary changes to the agricultural sector. Hence, as this person noted, it is “frustrating knowing that it is up to the people in power and control of our energy and agricultural industries.”

As with so many issues, this brings us back to activism and being politically active, as we need to put into positions of power people that will act to mitigate the climate crisis. While voting is obviously important here, so are activists, as they I need it to create awareness of the problem.

Project Drawdown allowed me to better understand the amount of change humanity can make in restoring the Earth and ultimately combat the climate crisis. Being able to visually see both the economic and environmental impact such changes can make to heal the Earth makes this desire to create a more sustainable future more realistic. Past readings and videos have often left me thinking that it is too late to act, yet I feel like these upcoming years will be the most vital in reversing the damage.

Perhaps the most important message coming out of Project Drawdown is that we can, as this person succinctly put it, “create a more sustainable future.” However, as this person also rightly notes, the “upcoming years will be the most vital in reversing the damage.”

Ideally, we should have acted decades ago when scientists realized the enormity of the problem. However, there is no use crying over spilled milk, as there is still time to act.

But we need to act now, immediately. While we should definitely welcome new technology and solutions as they become available, there is no need to wait for them. As Project Drawdown makes clear, we have all the solutions that we need, right now.