What is Sustainability? October 12, 2017 Talk to the Sierra Club. John Sagebiel.

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Note to readers: This is intended to be a speech, not a written piece. As such, I have intentionally repeated things several time and some of the pacing and cadence of the sentences were intended to be read out loud.

Introduction: Language

Plenty of people will tell you to open a talk with a joke, so how about this one: "Time flies like an arrow, fruit flies like a banana."

This is funny for me because of the juxtaposition of two pairs of homographs, that is words that are spelled the same but have different meanings. So we have "flies" as a verb and "flies" as a plural noun. In addition, we have "like" as a preposition and "like" as a verb. Context also helps us work out what form of the homographs we have. When I put the modifier "fruit" in front of "flies," the context helps you figure out that I mean the plural noun for the insect in that case. Each statement make sense on its own, but isn't funny, but next to each other, we are forced into this comparison that does not make sense and our response, fortunately, is to laugh.

This is not going to be a stand up comedy routine, nor will it be a discussion of grammar, but I wanted to start by getting you thinking about language.

As you can see, like so many of the great things in life, birth, sex, food, poetry, music, and human relationships, language is messy. It's not always clear and clean, and that is not just a good thing, that is an essential thing. Ambiguity can be a good thing if it makes you think. At some point in this talk, I'm going to be intentionally ambiguous about what I think.

In George Orwell's novel **1984**, he describes the language "Newspeak" created by the Party to control ideas and even thoughts by eliminating words that express opinions they don't want expressed. The goal was clarity and control. Clarity may be enhanced, but the loss of expression is inexcusable. Totalitarian governments ultimately don't care what you think, as long as you all think the same. In the extreme, if you can eliminate subversive words, you can eliminate the subversive ideas and thus eliminate the subversion.

We have the opposite situation in English -- we take in words not just from the languages we grew up near, like French, and Spanish, but also from less related languages -- all languages even, and this enhances and enriches our language and our ideas. In many ways, it is what allows us to think new thoughts, to invent new ideas, and even new things.

While Newspeak may have eliminated certain words, in English, we sometimes try to hide from words we would rather not say. We even have a word for that, we call it a "euphemism." Literally that means "well speaking" or "good speaking," depending on how you translate the greek prefix "eu." I could easily imagine those two words becoming part of the Newspeak vocabulary, which as created by Orwell includes the word "goodthink" to describe approved thoughts. Think about what we have euphemisms for: bodily functions, sex, death, and even political persuasions.

Let's take a small diversion into that last one. Let's talk about two words, "liberal," and "progressive." Now think about how much you've heard either of those recently. I kept thinking that I've not heard people call themselves "liberal" lately. In fact I found an NPR story from last year that discussed this very issue and went so far as to call "progressive" a euphemism for "liberal." Wow, that's like admitting that "liberal" is a slur used against people rather than a label for a set of ideas or approaches. I have seen these kinds of uses of the word liberal myself where it really is thrown out there as a slur or negative label. So it is not unreasonable for those who identify with this to let it go and change their label, their self-identity. The alternative is to try and reclaim the word. I'm not sure I see any effort to reclaim liberal as a positive, but time will tell, and maybe, that word will come back into use.

What's fascinating about this to me is that in the early part of the 20th century, the United States had a "Progressive" party that ran none other than the great progressive politician Teddy Roosevelt for president in 1912. And before that Roosevelt was a Republican. So, the word changes from the political right to the political left within a century. And that's ok, I earlier talked about the messiness and fungibility of words and our language. And that's something I love.

The point is that language matters. What we use to communicate matters. And context matters. As importantly, words carry their history with them, much like we do. And those histories are constantly being written.

I call myself a conservative. And I am, I believe in conserving a lot of things. But that word too has many meanings. I wonder how many of you thought that meant I was a registered republican when I said that? And what if I am? Does that change your attitude toward me speaking to about sustainability? You see, words really do matter.

If I'm a conservative about energy, and I talk about conserving energy what I really mean is eliminating it. Not using, in this context, is "conserving." In the case of electricity this means not generating it in the first place, which means what I'm conserving is actually….. nothing. I'm avoiding creating something. Is that a double negative?

Which makes that use of conservation somewhat different from the notion of conserving our natural resources. In that case it means literally leaving it as it is. Leave the coal in the ground, leave the tree where it is.

Some people speak more broadly of "conserving nature." This is a funny idea to me because I've alway disliked the distinction between "nature" and "human," as if we aren't part of nature. What are we then, synthetic? We are not only a part of nature, we are a product of it. But even that I dislike because it suggests that nature produces something. Nature just is. It has no objective, no plan.

As for this nature/human distinction, I think the better outcome would be if we really came to embrace nature as us and us as nature. That way, I hope we would better see that saving nature is really saving us. Years ago when there was an attempt to eliminate or reduce the harvesting of whales there were lots of T-shirts around with "Save the Whales" on them, but I think my favorite were the cleaver people who printed shirts with a pod of whales and the phrase "Save the Humans." Again there's humor in that with the juxtaposition, but there's also the more important message that saving the whales means saving the humans. The two are inexorably linked, as is all of nature. Which includes us. Rather than a declaration of independence, we might need a declaration of interdependence. As we'll see a bit later, there are examples of this and they are bleak.

But I must be careful, because I don't want you to think of my desire to conserve things as a desire to preserve them. I don't want to preserve nature, as many have done, because that makes me think of a fish floating in formalin, not water. Now, that fish may be very well preserved, but I'm not sure she's happy about it.

You see, language matters.

Sustainability: The word, the options, good and bad

This was all to serve as an introduction to talking about Sustainability which is a word that describes a concept or set of concepts. What are we saying when we say something is "sustainable?" What does that word really mean, and are there better words?

So, let's start by looking at this word and how's it's been used, and why people are starting to use other words to describe these ideas. What are we trying to sustain, and is sustainability the best word to convey the intention?

Sustainability is most commonly defined as a way of meeting our needs while not limiting the ability of future generations to meet their needs. This comes from a 1987 UN commission, known as the Brundtland Commission and is often called the Brundtland definition. Other ways it has been defined it have everything be renewable or reusable -- no waste anywhere in the system. There are some more poetic definitions that I'll get to later, but we'll start here.

Is it actually possible to be sustainable? Is that even a reasonable goal? Is there a time frame on that? Time is an important aspect of this, and one that is not often acknowledged. Over a 1 year time frame it's easy, over 100 years, a bit harder, but what about 4 billion years? That last once was chosen because it's about the amount of time the planet has left before the sun becomes a red giant and kills off everything on earth. And probably Mars to, hopefully someone has told Elon that. Putting that in perspective, the earliest hominid species came around about 200,000 years ago. Do a little math and there are about 20,000 of those 200,000 year periods left. That means 20,000 different species of human might evolve in the time we have left. It may be unreasonable to try and predict what's going to happen in 4 billion years, but my larger point is that there really is an implied time constraint on any discussion of sustainability.

Back to the Brundtland definition, Let's consider this word "needs?" What does that really mean? Food, water, and shelter? Or more than that? Who decides? Same thing with the phrase "future generations." How far forward are we to consider? One generation, or 4 billion years' worth of them. I don't have solid answers to these questions.

Sustainability is often associated with the environmental movement, but this limits its impact and importance. I'm happy to call myself an environmentalist, though often feel the need to clarify what that means. I am certain the earth and some kind of living ecosystems will be here for a long time, with or without humans. When I talk of the environment, I mean an ecosystem and planet-wide environment capable of supporting human habitation and advancement. Sustaining that kind of global system, therefore, becomes a necessary prerequisite to this end.

This is where I think those of us who promote sustainability have a problem. And it is what has started people looking for other words. When someone can dismiss sustainability by associating it with "tree huggers" (no sap on my clothes). Then we have a problem and we have a bunch of people tuning out. That's not good, because this is important and we need to engage people.

The word "sustainability" has challenges, as many writers on the subject have pointed out. The architect William McDonough has argued against the word sustainability on the basis of its blandness. He asks, "…shouldn't we really be looking for something that is actually fecund—you know that's full of blood and vigor and excitement?" He also twists this around a bit and says, "If I asked how your relationship with your husband is and you said, 'sustainable,' I'd almost feed like I would have to say, 'gee, I'm sorry to hear that.' "

So McDonough is saying sustainability is not a very interesting or exciting idea. But I am here to reclaim this word and make you think it is interesting, exciting, and essential. I think the key way I am going to do this is by broadening the parts of human society that we should all be thinking of when we think of sustainability. At the same time, I will argue that the word's blandness is both a strength and a good reason to keep it. First of all, who can be offended by something as mild as being sustainable? The word also travels well. We can talk of sustainable energy, but also of a sustainable food system or water source or cultural or artistic community. As I hope to show soon, all of these are essential components of a truly sustainable culture.

McDonough does offer suggestions for some parts of sustainability, such as rather than talking about something having zero impact, why not reverse that expression and say we have something that is 100% positive impact? Who woke up this morning and wanted to achieve zero today? No matter how good that might be. That works maybe for energy (think 100% renewable vs. 0 carbon energy), but as I'll discuss this does not work elsewhere in what I see as key elements of sustainability.

The historian William Cronon has written and spoken extensively on this history of the use of sustainability, and also criticizes the word for several reasons among them that it is often associated with further consumption, by being used to encourage people to consume more, but in a "sustainable" way. McDonough collaborated with the chemist Michael Braungart to write "Cradle-to-Cradle: Rethinking the Way We Make Things." The book's key idea is to eliminate the very concept of waste. Thus, they write, "waste equals food." In other words the endgame for everything we make is not that it becomes waste, but that it becomes food; either food in the way we normally think of it, like something that can be composted (food for microbes) or a "technical nutrient" – something that feeds into a manufacturing process with 100% recovery. That's sustainable, but almost never achieved at the present time. Most of our commodity recyclables are not recyclable. Plastics are the worst, almost none of which is recycled most is "decycled" or "downcycled" into lower grade plastics. I call this one-step out of the landfill, not recycling. Glass is recyclable, but doesn't save much energy and is a non-issue in a landfill. It's essentially sand. The exception is metals, which are not only 100% recyclable but easy to extract from a waste stream and they give you back a perfectly good product. This is why I am a strong advocate for drinking beer from cans — and some very good beers come in cans.

The writer Jeremy Butman argued in the New York Times against the word and even the concept of sustainability, pointing out the word often is used in the context of "preserving" as in wanting to sustain a certain natural system. The bigger challenge with this, as my discussions with ecologists have shown me, is that we humans often seek to preserve or sustain what we think an ecosystem should **look** like, as opposed to how it really should function. Visual landscapes vs. functional landscapes is how the ecologist Dr. Mary Cablk presented it and I think this is a valuable way to consider this. We want to see a forest as a specific mix of tree species, but forget the functions of providing habitat, oxygen, and cleaning and infiltrating rainwater. This gets us back to the distinction between sustaining what we see as opposed to supporting the systems necessary to continue the full functionality of the system. Supporting what it is we seek allows us to speak in positive terms: we support clean air and clean water. It becomes a statement of a goal. Then we have to figure out how to make

our systems work toward that goal. Still, the words seem to either come up short, or require too much explanation to be useful.

Other words have been used to substitute for sustainability and expand what we mean by it. Some have argued for "resilience" or "resiliency" – a usage borrowed from the field of ecology. In this context, a resilient system is one that can survive shock and impacts of various kinds. However, the resulting system may look quite different from the initial case, but is still functioning in a broad sense. This has some real advantages when looking at issues surrounding sustainability since it is likely our systems will have to change, I think the lack of understanding of the deeper meaning of this word argues against its use.

I also think resilience was picked up as a term much as "progressive" was by many liberals because users of the term wanted to distance themselves from something that was seen as weak or tree-hugging, and wasn't playing well. Resilience, sounds tough and strong, you know you are resilient to floods or hurricanes or icebergs. What I think these people don't understand is that ecologically resilient systems are subject to massive upheavals and changes -- changes that I think most people do not want. Again, I come back to this notion of preservation; I think those using "resilience" mean a strong system that never changes. That's just not reality. **If** resilience means strength to people, then we have to ask what is it being strong against. The danger in this is it implies that we are facing a global weather pattern that is the product of our extractive society and is something we have to fight against. That global warming and ecosystem destruction are inevitable and we better steel ourselves against these onslaughts. To me, this implies that it's coming and there's nothing we can do about it. I feel like that's a surrender position and I want to oppose that notion. I know we can correct things and not have to build massive infrastructure to fight the monster we made.

There are many instructive examples to be found that help define sustainability. Perhaps my favorite is the island analogy. I talked earlier of the earth and, in a very literal way, the earth is an island. An island in the cosmos, the only place we are currently aware of capable of supporting life like us. On this earth there are many islands and in times past they were functionally not unlike this earth -- the inhabitants may not have known of any place else that would support them. One of the most fascinating of these is Easter Island the place with the large elongated human head statues called "moai" and the stone platforms they sat on called "ahu." Easter Island today is a fairly desolate place, but the archeological record indicates it was once a very lush, forested island with a rich and productive ecosystem.

Easter is a small island, only about 66 square miles with the longest straight line you can walk being just 14 miles. A nice day hike. It is the most isolated land mass on earth. We know about the ecological history of the island because of pollen analysis of sediment core samples that show a wide variety of species including some of the biggest palm trees ever seen. These have also been preserved in castings in the volcanic flow. These trees had trunks in excess of 7 feet in diameter, and perhaps 70 feet tall. This was a productive place.

The apparent cause of the collapse of this society was the complete deforestation of the island by the residents there. There's a great summary of this Jared Diamond's book "Collapse: How Societies Choose to Fail or Succeed." As the society grew, it's demand for resources grew and it continued to cut down trees as it needed more fuel and building materials, and eventually destroyed the ecosystem that supported them on this small island. This is one of the most extreme examples of deforestation and habitat destruction ever, but it still is an excellent example of what can happen in isolation. The loss of the trees led to the loss of the major source of materials and fuel for the islanders, essentially the end of their supply chain. This also led to a loss of most of their wild foods, both land and sea based because without the big trees, they could not make the canoes to get out and fish for the larger fish. They also lost their

crops because of massive erosion and loss of the groundwater storage. The wind breaks were gone, the soil desiccated and collapse ensued. Due to its subtropical location at 27 degrees south latitude there is a need for fuel for heat in the winter and all of this was lost. The tradition prior to this collapse was for cremation as a burial technique and the loss of this option caused further collapse in the spiritual and cultural traditions of the island. This led to wars among fractions that had previously cooperated and even significant amounts of cannibalism. They began toppling the statues and destroying everything. That the islanders themselves destroyed their own ancestors' work bring an overwhelming sense of tragedy to this whole story.

From an estimate high of 30,000 people on this island at its peak to one estimate of 111 native islanders left after all the devastation. Why would a people destroy the forest that provided everything? Similar questions could arise for any culture of which we now live in a global one. They got to a tipping point, and then kept going. The analogy to extinction of a species is another way to look at this. One definition of extinction is no individual of that species left but there is a functional definition, when maybe one or only a few very isolated species left — they become functionally extinct. It's then just a matter of waiting out that last individual's lifetime.

In his book, Diamond asks an intriguing question: "What did the Easter Islander who cut down the last palm tree say while he was doing it?" Did he shout "Jobs not trees!"; or perhaps "technology will solve our problems, never fear, we'll find a substitute for wood."; or maybe "we don't have proof that there aren't palms somewhere else on the island, your proposed ban on logging is premature and driven by fear mongering."

I extend Diamond's question a few steps to ask what the person thought who cut down the second to last tree, or even the third to last tree, or more importantly, the person who cut down that tree that could not be replaced at the consumption rate. Because consuming any natural resource faster that its self-replacement rate is, by definition, not sustainable. I guess overconsumption is another potential definition for sustainability. Various organizations measure what is called earth overshoot day — the day where we have consumed the resources that the planet can restore in one year. In 2017, the day was August 2. That means from there to December 31 we are consuming material we cannot restore in the same time.

Yes, there are differences between Easter Island and the earth as a whole, but if a few thousand people with muscle power and hand tools made of stone can destroy an entire island and society, what can seven and a half billion people with metal tools and machine power do?

How green: Rating Sustainability

I work at the University of Nevada, Reno. We are, in some ways, an island surrounded by other parts of the city. We have our own economic and cultural influences. But I also think we have a special responsibility in this community and are very much part of this community. We take a lot of steps to make ourselves more sustainable, but what does that really mean. There is a way to find out.

The Association for the Advancement of Sustainability in Higher Education (AASHE) has a program called the Sustainability Tracking Assessment & Rating System (STARS), "… a transparent, self-reporting framework for colleges and universities to measure their sustainability performance." Essentially this is a point-based system to assess sustainability efforts, inform universities about how they are doing and identify what they might look to do in the future. The University of Nevada, Reno is currently undertaking an effort to complete a STARS rating. It is enlightening to look at the categories included in STARS because these show what current thinking really values in sustainability.

For example, Academics covers both teaching and research, and includes such metrics as what courses are taught and how much the institution makes its campus a living laboratory which is sometimes called the Shadow Curriculum. I love the idea of the shadow curriculum because it's such a perfect analogy to the academic curriculum. As we teach in the classroom, so can we instruct how we operate the campus. This is teaching in the shadows, it it also the part of the curriculum that literally casts a shadow. The Research section includes a metric on open access to research; I think this is making the argument that the best outcome for research is for the knowledge to be widely available and applied.

The second category is Engagement with sections for both Campus (internal) engagement and Public (external) engagement. The internal engagement covers item like student orientation and student life and employee orientation. Essentially telling our internal community what we are doing and how well. The external components include continuing education and service, but also participation in public processes and partnerships with the local community. The point here is that we need to be engaged with our community and ultimately our world in order to be sustainable. Building a wall around the campus, or anything else for that matter, doesn't help, no matter how well we are doing inside.

These two sections get us through half the rating system and haven't even touched some of my favorite topics like energy and water. Those come in the third section, Operations. Here we see subsections you might expect like Air & Climate, Buildings, Energy, Transportation, Water, and Waste, but also sections on Food & Dining and Purchasing. Since we are a significant economic entity here in Northern Nevada, what we buy and how we can encourage our suppliers through those purchases can really matter.

The last section is Planning & Administration and covers areas like Coordination & Planning, Diversity & Affordability, Investment, and Wellbeing & Work. Again, what I see just by reviewing these categories is that most of them have nothing to do with the ecological or climatological impacts of our campus; they have to do with our place in this community. What this rating system is saying is that we cannot just build an isolated campus, we have to be engaged at all levels. Maybe that's the word I'm looking for, after all, being engaged, with all the implications of that word, is what sustainability is about.

More importantly, as a campus and a community, talking about sustainability allows us to address our values, our hopes, our intentions, and our aspirations. When we talk about sustainability we are, in part, recognizing that many of our current systems are based on resource extraction and consumption more than they are on resource regeneration. Thus, a good starting point is striving to be more resource efficient; to look to and build for the long term; and to constantly evaluate how we operate. That must include both that internal and external engagement I have talked about. Sometimes, it might appear that there are inconsistencies by talking about sustainability while we burn non-renewable petroleum fuels to heat our buildings. To me, recognizing the inconsistencies is not about compromise or acceptance as much as it is about education and always looking for ways to improve.

That is important as we are an educational institution. This is, in many ways, why we are here. As we educate in the classroom, so should we educate on the walkways around campus. The way we operate our campus – what I earlier called the shadow curriculum – informs our entire community about these issues, and at the same time lets everyone see some of these practices put into use. As I said earlier this is not about compromise, but about recognition and appreciation. I'd like to summarized this idea with a quote from Wendell Berry from his essay, The Pleasures of Eating:

> "I mentioned earlier the politics, esthetics, and ethics of food. But to speak of the pleasure of eating is to go beyond those categories. Eating with the fullest pleasure —

pleasure, that is, that does not depend on ignorance — is perhaps the profoundest enactment of our connection with the world. In this pleasure we experience and celebrate our dependence and our gratitude, for we are living from mystery, from creatures we did not make and powers we cannot comprehend."

Replacing the word "eating" with the word "living" we can get:

"Living with a pleasure that does not depend upon ignorance is perhaps the profoundest enactment of our connection with the world."

That, to me, is what talking about sustainability really means – it means knowledge and understanding with the hope that this will lead us to changing how we act and moving toward a more sustainable path forward. I think most people will respond more positively once they obtain a clearer understanding of the impacts of their actions and decisions. And once they have options that are truly viable. We are at that nexus now.

Earlier I told you I wanted to reclaim the word sustainability by expanding the part of human society that we need to include. What I've tried to do by presenting the STARS rating system is not just show what a University can do, but to show that a large consensus-based rating system takes into account so much more than our energy and water consumption or greenhouse gas emissions. It encompasses our relationship with our larger community and the world. I have tried to bring in this broad educationally-based way of looking at sustainability and quoting writers not engineers. I'm often more comfortable with the hard numbers of kilowatt hours and therms, but I know I'm going to loose people that way. But engaging with these broader community-based approaches is hopefully going to reach everyone. We all have to live here, this place. We have to be native to place and that place has to be the planet.

There's also a more focussed rating system specific to buildings that many of you may be familiar with. The Leadership in Energy and Environmental Design standard, also known simply as LEED was developed by the US Green Building Council and rates buildings on their performance. Even the early versions of LEED included educational components about the building. Expanding that, the Cascadia Green Building Council created the Living Building Challenge as an even higher standard building rating. This rating system includes my favorite rating category, "Beauty and Spirit." The entire description of this category is:

"The project must contain design features
intended solely for human delight and
the celebration of culture, spirit and place
appropriate to its function and meaningfully
integrate public art."

Although I might take delight in a kWh meter, that's not going to fly here. The way I read this, even features that have dual purpose including a function within the building do not count. The word "solely" means that's its only function. Think of those "design feature" as parts of the building that could be art. Why is this in a green building rating system? Because it matters. Have you ever seen a 1950's era Soviet-bloc apartment building? I get depressed looking at photos of those, imagine what it was like living in that? I'm sure a good engineer could make a building that horrible-looking ultra-efficient, but why? We are not kilowatt hour meters, we are human -- we are inspired by beauty, by natural systems, by light and color and unexpected features put there solely for our delight. This is important to recognize and it's why these sustainability rating systems do just that.

Just over 16 years ago I started a process of designing and building my own home. And true to type, I was immediately focussed on the solar energy systems I wanted, the grey-water recovery system and other things I could measure. Fortunately I found an architect who was

well versed in green design (this before there even was a LEED for homes rating), not just to be green, but to be great design. He taught me that materials, color, shapes, and this idea of "relating to place" mattered as much as my kilowatt hour meter. I learned a lot and ended up with a really great home and no fewer than four kilowatt hour meters.

One of the items in my house is an old mechanical clock that was built about 1810, according to the craftsman who rebuilt it after it fell off a wall in my parents' house. It's been in our family, on my father's side, as long as anyone can remember. It still keeps great time, needs winding only about every 5 days. We all should be so useful at over 200 years old. According to my clock repair expert, it's rather rare. It was most likely made by an apprentice of the great American clock builder, Simon Willard, in New England. Willard popularized this "banjo" style clock and it was widely copied. What makes it rare is not its unknown maker or its style, but the fact that it was made before the US Civil War. The gears are brass, hand cut. The weights are lead, and we think original. Brass was used for cannon and lead for bullets. Lots of these clocks were melted down for war materiel. It means to me that this clock was prized by someone. It might have been hidden for many years so it couldn't be melted down. I'm glad someone cared enough to hold this so we can still look at it, and reflect.

What I hear when I listen to this clock count time is history. When this clock started working, the United States of America was a mere 34 years old. Not even old enough to be elected president according to its own constitution that wasn't finally ratified by Vermont until 1791, which means the constitution would have been a mere 19 years old when this clock started counting time. In 1810 when this clock was made, it was legal to own black slaves in the United States, and it was illegal to vote if you happened to have been born female.

What this reminds me of and why this is important today is that we should build for the long term – build clocks that last over 200 years, build constitutions that last even longer. At the same time, be willing to tear down institutions that are wrong or destined for the dust bin of history anyway – slavery and voting restrictions fit there. So build good things, tear down bad ones, and know the difference.

When this clock started counting time, the second and third presidents of the United States, John Adams and Thomas Jefferson were both still alive. They died with hours of each other (Jefferson first) on July 4, 1826, the 50th anniversary of the signing of the Declaration of Independence. At the time of Jefferson and Adams' deaths, this clock had been ticking for 16 years. Since then, we fought the Civil War, two world wars, and faced many other challenges, both internal and external. And this clock keeps marking time.

What's really important in all that has happened as this clock worked is that people came together to solve problems. Adams and Jefferson were often political adversaries, but worked together to nurture the young nation – to build a future that they would not live to see. Through the challenges like wars and economic depressions this clock has seen, people have always come together to get done whatever was needed, to secure that future. Now it's our turn to come together, to work for a sustainable future.

I have come to believe that the unknown maker who built this clock was an optimist. The reasonI believe that is that is because he built it to last. He built it with the belief that there would be a future, that 200 years after its construction it would still be working as well as the day he started it, and that people much like him would still be around to wind it, care for it, and enjoy it. Like my clock's builder, I too am an optimist. That's yet another way of looking at sustainability.

So understanding of what we are doing and interpreting sustainability as broadly as we can are going to bring the most people we can into this conversation and understand what we must do to move forward in a sustainable direction.

Closing: Call to action, call for hope

The great writer of the American west, Terry Tempest Williams once wrote: "The eyes of the future are looking back at us and they are praying for us to see beyond our own time." Seeing beyond our own time is, for me, one of the greatest definitions of sustainability. In five short words it captures perhaps more than I have said all evening. It implies a responsibility we shoulder for future generations of our actions, and at the same time it recognizes that this vision is with us. That should be enough motivation to do something. I'm standing here in front of an organization that has done so much, and yet I'm still often curious about why people sometimes feel paralyzed when they think about speaking out on these issues. We should not have everyone speaking as I do, my voice is my own -- and diversity of voices, as in ecosystems, is strength. I come from a technical background but have found that is not always the best way to reach people. So I wondered how do we best reach people? What are the modes of speaking or writing or singing that work? The answer is all of them. If you are wondering what kind of voices those are and if you can find a place for yours, I made a list of approaches, maybe you'll hear one that resonates with you. Or maybe you'll make your own.

You could write the drum-head pamphlet. Like Thomas Paine, writing on the head of a Revolutionary War drum, lay it out. Lay out the reasons why extractive cultures must change their ways. Lay out the reasons that inspire the activists. Lay out the reasons that shame the politicians. Lay out the reasons that guide the decision-makers.

Or you could sing the "broken-hearted hallelujah." Like Leonard Cohen, singing of loss and love, make clear the beauty of what we stand to lose or what we have already destroyed. Celebrate the microscopic sea-angels. Celebrate the children who live in the cold doorways and shanty camps. Celebrate the swamp at the end of the road. Leave no doubt of the magnitude of their value and the enormity of the crime, to let them pass away unnoticed. These are elegies, these are praise songs, these are love songs.

Or be The Witness. Like Cassandra howling at the gates of Troy, bear witness to what you know to be true. Tell the truths that have been bent by skilled advertising. Tell the truths that have been concealed by adroit regulations. Tell the truths that have been denied by fear or complacency. Go to the tarfields, go to the broken pipelines. Tell that story. Be the noisy gong and clanging cymbals, and be the love.

Or bing the narrative of the moral imagination. With stories, novels, and poems, take the reader inside the minds and hearts of those who live the consequences of global warming. Who are they? How do they live? What consoles them? Powerful stories teach empathy, build the power to imagine oneself into another's place, to feel others' sorrow, joy, and love. And in doing so take readers outside the self-absorption that allows the destruction to continue.

Or try the radical imaginary. Re-imagine the world. Push out the boundaries of the human imagination, too long hog-tied by mass media, to create the open space where new ideas can flourish. Maybe it is easier to imagine the end of the world than the end of capitalism or fossil fuels or terminal selfishness. But this is the work that calls us—to imagine new life-ways into existence. We may not be able to save the old world, but we can help define the new one. Make it a good one.

Or bring the Indictment. Like Jefferson writing the Declaration of American Independence, listing the repeated injuries and usurpations, let facts be submitted to a candid world. We Hold These Truths to Be Self Evident. That all creatures have a right to live, to breathe clean air, to drink clean water. This is the voice of outrage. How did we come to embrace an economic system that would wreck the world? What iniquity allows it to continue?

Or finally, with a deep bow to Terry Tempest Williams, offer the apology. Talk to the future. Try to explain how we could allow the devastation of the world, how we could leave those who follow us only an impoverished, stripped, and dangerously unstable place. Beg their forgiveness. This is the literature of prayer. Is it possible to write on your knees, weeping?

I don't want to close this letting you think that I am anything less than an optimist about the future. To paraphrase Paul Hawken, if you look at the science of what is happening to our planet and you are not a pessimist, you don't understand the data. But on the other hand, if you look at the people who are doing great things, people like you coming together to build a better future. If you look at all of that – all of that strength, that energy, and that goodness and you're not an optimist, well then you don't have a pulse.

I still have one.