



Engineering Solutions to Climate Change Problems

Alex Perkins, Sustainable Manufacturing
Nantucket / Vermont

☀ Call to Action

Identify a problem you feel passionate about, and figure out what skills you need to learn so you can do something about it. Then find others who can work with you to create a solution. Learn more about Alex's work in technological solutions to climate change problems: www.roadpitch.co/pitcher/synticos-llc/

☀ Values

- Caring
- Cooperation
- Imagination
- Determination
- Commitment

☀ Lessons Learned

When you see something, do something! Use the resources you have to solve a problem you feel passionately about?

To solve environmental problems, reach out to others, and get them to work collaboratively toward the same goal.

We need to all work together to find alternatives to plastics that are healthier for people, and for our planet.

Alex Perkins grew up in Nantucket, helping his parents take tourists out on their whale-watching boat.

In high school he spent a semester in the Bahamas, where he learned about sustainability issues, and observed the horrible effects of burning plastic waste. He became fascinated with sustainability issues, and especially with finding technical solutions to these problems. First he joined with others to build a wind turbine at his school. Later he became a mechanical engineer, and even developed a machine that can turn plastic waste into fuel. For Alex, passion, technical skills, and collaborating with others are key to fighting the climate crisis. "We need to find innovative solutions to the problems we're facing," he says. "It's all about collaboration: talking about problems with friends, talking about ideas that you can build together."

☀ Language Arts

Imagine you are part of a group of students tasked with convincing your school to start using energy generated by wind power. In order to do this, you will need the support of other students, teachers, and administrators. Create a promotional piece to educate people in your school about the benefits of wind power. Be creative. You can use video, audio, graphic design, music, anything you like to create your campaign. Then write a reflection paper on the choices you made, and explain why you think this would be the most effective way to create awareness of the issue of your choice.

Create a social media post designed to convince people to join your cause. Address just one specific group of people in your school community (students, teachers, or administrators). You can use still images and/or video. Then write a reflection paper explaining why you made the choices you made: why you chose to

address that particular group of people (and how you think they can help your cause); why you addressed them the way you did (the language you used, the tone of the post, etc.); and why you chose the medium you used (video, music, graphics, written word).

Create a PowerPoint presentation about the importance of teaching sustainability in schools. Focus on how including sustainability in the curriculum would add to the quality of kids' educations, and explain why using wind power at your school would contribute to the students' education. Then write a reflection paper explaining why you made the choices you made: why you chose to address that particular group of people (how you think they can help); why you addressed them the way you did (the language you used, the tone of the post, etc.), and why you chose the medium you used (video, music, graphics, written word).

Write a speech to be delivered to the school board on the issue of using wind-generated power for your school district. The speech must address not only the environmental benefits of wind power, but also the practical and financial benefits of this type of electricity. The speech must be no longer than three pages, and it must include facts gathered from research.

STEM Activities

Research areas in and around your community that could be sites for ecotourism. Alex's home in Nantucket is surrounded by the beautiful ocean. But a forested mountain range, a sprawling desert, or a prairie grassland could be equally interesting places to visit. Any places untouched by people are perfect spots to appreciate the beauty of our planet. Remember that it is important to remain respectful of the earth; leave everywhere you go just as it was when you arrived. List three potential ecotourism sites in or near your community, and three global ecotourism sites you may want to visit.

Are there any wind turbines or other sources of renewable energy in your community? If not, do you see any potential sources of renewable energy? For example, if there are large open fields with consistent sunshine upon them, solar panels could be installed to take advantage of the surface area. If you live in a particularly windy area (like Nantucket) a wind turbine could be the perfect answer to providing power to your community! List two renewable energy resources that you think would be a good fit for your community.

Learning is one of the most important steps on any journey; Alex helped his peers by creating a free online library. Check out your local library's selection of online books. Most libraries have books on sustainability and renewable energy; so sign up for a library card online and check out a book on sustainability. The keywords to search for are "sustainability," "renewable energy," "solar power," "geothermal," and "wind power."

Alex used "pyrolysis" to turn plastic waste into fuel. What other waste materials do you think could be recycled into something useful? For example, did you know that scientists have found ways to use corn husks as the base for a biological car fuel? List three items that you do not see being recycled (or that are not recycled efficiently) and think about how they could be turned into something useful.

What is a problem that you struggle with that you think could be aided, or fixed entirely, by technology? Alex says that change can happen even when it's not commercially viable, so don't limit yourselves only to profitable solutions. For example, it costs more money to build elevators in buildings than to simply use the stairs, but we can all agree that 90-story buildings do need elevators!

Sustainability Innovations

SeaAhead¹: SeaAhead is a blue tech startup platform, based in Boston, that helps build companies and facilitates investments. They are helping to catalyze a blue tech cluster in the Northeast.

AirCarbon²: AirCarbon uses natural ocean microorganisms to make PHB from air and greenhouse gases as an alternative to plastic.

ENGIE Impact³: **ENGIE Impact is a sustainability and energy management company.**

Sustainability Career Pathways

Mechanical Engineer. As Alex's story shows, with engineering skills we can redesign our manufacturing processes to make things—from wind turbines to toasters—more efficient and more sustainable! Want to explore the field of engineering? [Start here⁴](#).

Renewable Energy Site Design Consultant. A lot goes into identifying an appropriate site for a new renewable energy project, from figuring out whether it will generate enough electricity, to determining what impact it will have on the surrounding environment. As we transition to renewables, there is a great demand for people who are skilled in helping to set up new projects. For example, [GeoSubSea⁵](#), a consultancy firm, assesses and maps the design of offshore wind farm sites in the Northeastern United States.

Sustainable Finance. With billions of dollars being invested, where the money goes will shape the future of business. Should we be investing in oil companies, or in renewable energy companies? In downtown real estate or suburban malls? Working with a socially responsible investment firm, or with a university or foundation as an asset manager can be a great way to help develop the sustainable business sector. Here is a [brief introduction to the many jobs in the field⁶](#).

Inventor. It's not easy to invent something, and it's even harder to get the world to notice. But a good idea can change the world! Explore these [5 Steps to Inventing Something⁷](#), and these [7 steps to becoming a full-time inventor⁸](#).

1 <https://sea-ahead.com/>

2 <https://www.newlight.com/aircarbon>

3 <https://www.engieimpact.com/>

4 <https://www.topuniversities.com/courses/engineering/which-type-engineering-should-you-study>

5 <https://geosubseaconsulting.com/>

6 http://finanzasostenibile.it/wp-content/uploads/2017/04/13-04-2017_FBicciato_ProfessionistiSRI_SdR.pdf

7 <https://www.popularmechanics.com/technology/a5982/how-to-become-an-inventor-in-5-steps/>

8 <https://www.inc.com/stephen-key/so-you-think-you-want-to-be-a-full-time-inventor.html>

