It is my pleasure to introduce the 2018-19 Atmosphere/Energy Program newsletter. During the past 15 years of the A/E program, over 400 MS students, 50 undergraduates, and 15 PhD students have graduated. Our graduates have entered the workforce and have affected ideas, technologies, policies, and action in business, government, academia, and nonprofits. Many are also connected together through the A/E alumni pages on Linkedin and Facebook.

This year, students were involved in several major activities. The Solutions Project student group helped to update roadmaps to transition 143 countries of the world and dozens of cities to 100% clean, renewable energy. Previous roadmaps, developed with the help of many A/E alumni, have become the scientific justification for recent 100% or near 100% renewable electricity laws in California, Hawaii, Washington D.C., Puerto Rico, and New Mexico as well as the Green New Deal. The roadmaps have also inspired dozens of additional cities and businesses to commit to 100% renewables.

During the last years, some A/E students were involved in Stanford Energy Club activities. Others attended a spring break course at the Rocky Mountain Institute. This newsletter also reports on the annual rafting trip, the Halloween Party, a ski trip to Lake Tahoe, football tail-gaiters, weekly A/E seminars, and other activities. I would like to thank the A/E Newsletter Staff for their help this year in putting together the newsletter: Chengliang Fan, Catherine Hay, Kemp Gregory, Corey Shono, Tim Yeskoo, Zhenhua Zhang, and Kevin Zhu. Finally, I would like to welcome the new A/E class.

Mark Z. Jacobson, Director
Program Evolution

The Atmosphere/Energy program continues to evolve and produce amazing students. A/E students have diverse backgrounds and experiences but come together with common interests in clean renewable energy, climate, air pollution, and health. The program includes students at the undergraduate, masters, doctorate, and post-doctorate levels.

Class of 2019 A/E MS Graduate Statements

Amanda Maki - I feel very fortunate to have been a part of the Atmosphere/Energy program at Stanford. Through the program I have been able to expand my knowledge in many aspects of the energy field, from engineering to policy to business. I have made very valuable connections through the A/E network as well as some amazing friends these past two years. I am excited to use everything I have learned in A/E to make my own positive changes in the energy and sustainability sectors.

Avery McEvoy - A/E was where I found motivation, direction, and camaraderie. The people are truly what make the program succeed -- they are passionate, friendly, active, and inspirational. I found a home in the A/E program. Being surrounded by hardworking people who share one common interest is extremely empowering, comforting, and motivating. The courses offered are challenging, intriguing, and above all, applicable. I think what sets A/E apart from other programs is just how much of what you learn can relate to the real world. Having those skills be directly transferable to my career after graduation is one of the things for which I am most grateful. Thank you to A/E for aligning my life and giving me one of the most wonderful communities out there! Let's go save the world!

Bianca Draud - The Atmosphere and Energy masters program has been absolutely life-changing. The network of people is a group of leaders in clean energy who will make grand strides in improving the state of sustainability in a variety of industries. I am so honored to be a member of this group of people. Being in this circle has afforded me invaluable opportunities toward making my own impact in clean energy industries. I look forward to having the resources to provide a similarly incredible opportunity for future masters candidates in A/E!!!

Matt Alexander - Filled with some of the brightest, most passionate, and fun people I’ve ever met, the Atmosphere and Energy program was an incredibly unique and wonderful experience. I feel so fortunate to have had the opportunity to learn from some of the most influential leaders in the energy field about such important topics, and to have made lifelong friendships and connections along the way. In a time where everything around us seems negative and to be spiraling out of control, knowing that there are so many people who are devoted to making a difference is extremely uplifting. I have had such a blast in my two years at Stanford and can’t wait to see what the future holds for my fellow alums and A/E!
Overview of PhD Research

Scott Katalenich is researching how to make warfare more environmentally friendly. Scott has built three models to investigate how the world’s largest consumer of oil can instead use clean, renewable energy. His first model quantifies the potential for converting military tanks, helicopters, airplanes, and watercraft to either battery electric or hydrogen fuel cell platforms. His second model quantifies the cost benefits of using wind and solar in lieu of diesel generators for electricity production at forward operating bases. His third model quantifies the wind and solar infrastructure required to provide 143 Army installations worldwide with all of their energy needs by 2050. In all cases, the goal is to improve energy security, energy resilience, and mission readiness.

Dan Sambor studies how we can provide clean, reliable, and affordable electricity to the over 1 billion people in the world who still lack access. Specifically, he is working with remote indigenous communities in Alaska and Malaysia to design renewable microgrids to enhance energy security. His thesis proposes that predicting and optimizing demand-side management strategies, as part of his renewable microgrid design tool, can provide more affordable energy access while also improving food and water security through the addition of new load technologies.

Anna-Katharina von Krauland’s research focuses on optimizing and expediting the process of wind farm siting through the creation of digitized maps for the United States. Her project aims to reduce uncertainty before the macro-siting stage of a new wind project and is expected to reduce the development time of projects with a high concentration of infrastructure. This will help wind farm developers, city planners, policy makers, scientists, and utilities make more informed decisions regarding the numbers, locations, and physical sizes of wind farms needed for wind to supply a substantial portion of a state’s power demand.

Alumni Updates

Grace Hsu, Class of ‘09
Grace is an in-house renewable energy attorney specializing in project finance and development for Clearway Energy Group (formerly NRG Renewables), one of the largest clean energy developers in the United States, where she negotiates power purchase agreements, equipment supply agreements, and financing agreements for community solar, utility solar and utility wind projects and advises on the company's safe harbor tax strategy. Combining a law degree with her engineering degree has been a great way to continue to develop a broad perspective on climate and energy challenges that she enjoyed so much from her time at A/E.

Charlotte Franzellin, Class of ‘16
Charlotte is a Principal at The Renewables Consulting Group (RCG), a technical consultancy working in the renewable energy space, with a key focus on offshore wind. After having spent one year in the company's New York office, she has recently relocated to London where she is getting exposed to a wider range of markets. At RCG, Charlotte has been leading on several key strategic market entry assignments, technical site characterizations, LCoE modelling and risk analyses for projects all over the world. The A/E program helped Charlotte learn about the energy industry, gain consciousness about the urgency of climate change and make valuable connections and friendships that will last a lifetime.
The Stanford Energy Club was well represented this year by A/E students! Kevin Zhu and Catherine Hay helped organize and run the first annual Stanford Cleantech Challenge sponsored by Google, Total, Silicon Valley Clean Energy, and RNG Coalition. Many A/E students participated and 3 out of the 4 finalist teams were represented by A/E. The winner was Team Home with A/E’s Robbie Harding followed closely by Team AC/DC with Velvet Gaston from A/E. Other A/E finalist included Robert Spragg, Timnah Zimet, and Justin Luke. Congratulations to all the participants! Going into next year, A/E’s Zhenhua Zhang will be leading the business development team for SEC!

This year, a group of A/E students spent their spring break in the beautiful mountains of Colorado to expand their thinking during an intensive six-day course at Rocky Mountain Institute (RMI), directly working with energy efficiency guru Amory Lovins and his team. The course was CEE 107R/207R: E³ – Extreme Energy Efficiency, focusing on whole system thinking, integrative design, and energy efficiency in industry, mobility, buildings, and electricity.

**2018-2019 Visiting Scholar Testimonial**  
*Joshua Eichman - National Renewable Energy Laboratory (NREL), CO*

I work at the National Renewable Energy Laboratory in Golden, CO and I am currently a visiting scholar at Stanford. In support of renewables and environmental and economic goals, grid management of existing and new resources continues to increase in importance. At NREL, I support grid integration activities related to energy storage, demand response and electric vehicles. Being at Stanford surrounded by driven and talented students and staff performing cutting edge research and development activities that will shape our energy system in the future has been very a rewarding experience. Also, California provides an important testbed for these activities and Stanford is plugged into what is happening in the state and around the world. For these reasons, I find the interactions that I have at Stanford with students and staff represent a very valuable collaborative opportunity.

**E³ Course at Rocky Mountain Institute**

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**Stanford Energy Club**

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A/E Social Activities

Rafting Trip
The annual tradition of rafting along the South Fork of the American River continued with old and new A/E graduate students and alumni before the start of classes. This year’s cohort had a great time getting to know the new master’s students, catching up on everyone’s summers, and getting wet. As always, this trip is only possible due to Teddy Kisch’s generosity in organizing and leading this event so thank you Teddy! We would also like to thank Beyond Limits for their wonderful hospitality and food.

Halloween Party
Another annual tradition, this year’s Halloween party had the entire cohort dressed in their best Atmosphere and Energy themed outfits! From the cumulonimbus clouds to a particle accelerator, this year’s costumes were definitely creative and eclectic. However, the winner of the costume contest was Cullen Sarles who 3D printed his own wind turbines and wore them as a wind farm! We can’t thank Mark Jacobson enough for hosting this event at his wonderful home and Tim Yeskoo for bartending and serving out delicious, Halloween themed drinks! We even had a spider pinata this year which was taken down swiftly by a Stormtrooper, power ranger and drowning polar bear.

Happy Hours and Tailgates
A year in A/E wouldn’t be complete without its regular happy hours throughout the year and tailgates during football season! Happy hours consistently served as a great de-stresser to the end of our long weeks and were filled with great bonding, games, and late nights. Fall quarter is highlighted by tailgates before every home football game. Tim Yeskoo organized and hosted every tailgate this year so a huge shoutout to Tim for organizing everything, providing food, drinks, and cornhole, and always showing his unrelenting support of Stanford Football.
More A/E Social Activities!

Nature
Stanford is blessed to have incredible outdoor activities in practically every direction you go! A/E students had the opportunity to hike in Muir Woods and hike Mt. Diablo, surf at Pacifica Beach, climb in Yosemite, and trail run in the Santa Cruz mountains.

Miscellaneous
Besides all of the other activities written about here, we still managed to have even more fun through various other events. Some of the highlights included students dressing up for Grad Formal, the first annual A/E field day, a thanksgiving potluck and tennis and ping-pong games!

Tahoe Ski Trip
With a record-setting season of snowfall that blanketed Tahoe in over 50 feet of snow, this year’s A/E ski trip was undeniably one of the highlights of the year! Over 25 students and alumni spent a weekend during winter quarter in an incredible lakefront house enjoying all that Tahoe has to offer. Whether it was shredding the pow pow at Squaw, cross-country skiing, hiking in the surrounding area or taking in the view of the lake from the hot tub, there was something for everybody. Tahoe Corey would like to thank everyone who encouraged and joined him in taking the polar plunge into the lake, Avery and Daniel for bringing all the ice, and a huge thank you from all of us to Tim Yeskoo for organizing this amazing trip!
Memorial: Karl Knapp (1959-2018)

It is with a heavy heart to announce the passing of Karl Knapp, who died peacefully at his home after a courageous battle with ALS. His wife, Holly, and his daughters, Haley and Tyler, were by his side.

Karl interacted with the Atmosphere / Energy program in many different ways over the years. Many will remember him as the primary instructor for the Understanding Energy course (previously known as Energy Resources), where Karl’s engaging lectures were always supplemented by his t-shirts that matched the theme of the day. Karl loved sharing his knowledge with the next generation of “renewable energy warriors,” and played a tremendous role in personally leading the 15+ field trips for the course. In other duties as an adjunct professor and VP of Sustainable Energy Education for MAP, Karl also led the biennial China Energy Systems spring break course, bringing a large group of students to myriad energy installations in China.

Beyond the classroom, Karl brought so much more to the A/E program through his love of Stanford football and basketball. Together with his wife Holly, Karl began the tradition of A/E tailgates by opening up his own tailgate to all students and friends of the program. These tailgates were well attended, bringing Karl’s lifelong friends and industry colleagues together with students, and easily making new A/E students feel at home at Stanford. Karl was the ultimate facilitator, known for a perfect balance of work and play, all while rocking out to his favorite band, the Grateful Dead.

Karl’s life was celebrated on December 2, 2018 at Arrillaga Alumni Center, with hundreds in attendance. It was amazing to see the diversity and sheer number of people who knew Karl and loved him so deeply. As Karl undoubtedly wanted, the celebration was complete with a rowdy Kentucky bourbon toast. Here’s to you Karl. You will be missed.
Facebook and LinkedIn

The network of incredible people we create through A/E is one of the most important and valuable aspects of our program. Past and present A/E students can easily keep in touch through the Linkedin and Facebook groups set up for the program. All former students and affiliates of the program are encouraged to join one or both groups so that we can build a stronger and lasting community of those involved in A/E.

https://www.facebook.com/groups/16750809562/

http://www.linkedin.com/groups?mostPopular=&gid=119300&trk=myg_ugrp_ovr

Schneider Fellowships

A few A/E students received Schneider fellowships to work at nongovernmental organizations in 2019. These include: Robbie Harding, Yanbo Shu, and Catherine Hay at the Natural Resources Defense Council, and Jake Glassman and Avery McEvoy at Rocky Mountain Institute.

Giving to Atmosphere/Energy

The strength and growth of our program depends on the interest and self-support of Atmosphere/Energy community members who feel a strong bond to the program. With the rising costs of university tuition, room and board, it is becoming increasingly difficult for students to support themselves. We strongly encourage former A/E student and affiliates to consider contributing to a future generation of students and researchers who will go on, as you did, to make a difference in our energy and atmospheric future. Gifts to the A/E program are tax deductible and can be made at:

http://cee.stanford.edu/programs/atmosphereenergy/giving-ae

For gifts large enough to sustain a full student fellowship for more than one year ($65,000+), the fellowship will be named after you or the person you designate for the period that the funding remains available.

Thank you for considering this opportunity to expand the knowledge of the engineers, scientists, and leaders of tomorrow.

The A/E program has been successfully growing over the past 15 years. It keeps providing students with many opportunities to learn more about atmospheric science, energy efficiency and renewables. There are many networking events available, helping students make connections with people from different disciplines and professionals in the field. Real hands-on projects also allow them to directly apply what they learn in the classroom, better preparing them to make a difference with their future careers.