

SEI U.S. Center 2017 Annual Report

1 Introduction and general center information

The repercussions of the late 2016 US elections made the start of 2017 a particularly challenging time for the US Center. Policy engagement and project funding opportunities – particularly in energy and climate – were in short supply, as federal agencies reversed course and froze new funding. Foundations, subnational governments, and other funders and audiences for SEI-US paused to regroup and develop new priorities. Assaults on the foundations of the science-policy bridge – specifically on the use of evidence-based research to inform sound policy – also created new uncertainties around the role of our work and raised difficult questions.

By the end of 2017, however, we found ourselves on solid footing once again, ending the year with a small surplus, though there are no doubt major new challenges ahead. We were able to retain funding for some key activities (e.g. US-China water-energy partnership) and even expand our work with USAID (e.g. Sustainable Water Partnership with SEI Asia and Africa). With the help of a development consultant, we developed a new foundation fundraising plan to build our internal capacities, diversify our funding sources, and launch new areas of work. And we have a number of major new projects and funding opportunities in the pipeline.

We also had a number of important successes in 2017 with notable impact on research, policy and capacity development. As described in Section 2, our work together with local partners brought a new focus to fossil fuel supply issues in the international climate negotiations, equipped California water resource decision-makers with a new tool to balance environmental streamflow considerations with other water needs, and provided Bolivian water officials with their first-ever comprehensive national water balance. We also initiated exciting new lines of work, such as exploring the role of citizen participation in environmental policy development, developing strategies for guiding sustainability transitions to ensure they are perceived as fair and equitable, providing tools to enhance understanding of how to integrate high levels of renewable energy into the grid, and developing training materials to promote gender and social equity in energy and water planning.

One of the highlights of 2017 was the very successful Tufts-SEI Nexus Symposium to commemorate the 10-year anniversary of our partnership with Tufts Institute of the Environment (TIE) (<http://environment.tufts.edu/events/tie-sei/>). 2017 also marked the first full year of operation of the US Board as a more independent entity (no longer with US staff on the Board), with new contributions to our organizational and fundraising activities.

This past year also witnessed important leadership transitions at the program level. The year began with Pete Erickson taking the reins of the Climate Policy group and ended with Marisa Escobar taking over from David Purkey as the interim Water Group director. We have a plan in place to recruit for, and decide on, the directorship in early 2018, as well as to build added

resilience of the Water Group. In addition, Emily Yehle joined the Center in May to take over the US Communications Officer role from Marion Davis, who departed earlier in the year. Overall, staffing levels remained relatively constant at 28 to 29 across the year.

We also were successful in increasing media and press coverage of our work, with US staff interviewed on television (in response to Trump's withdrawal from Paris) and featured in a front page New York Times article ("[Both Climate Leader and Oil Giant? A Norwegian Paradox](#)"). Staff also increased their social media engagement, as well as produced numerous blogs, opeds, and peer-reviewed journal articles (See Appendix).

We continued to advance our equity, diversity, and inclusion (EDI) action plan and goals. Specifically, we invested in the US Center's Women's Group to develop and run all-staff meetings on topics of inclusive meeting dynamics and the benefits of gender equity in the workplace, as well as to develop a brief on SEI-US's path to a more equitable future. As described in the Center Workplan, we will be expanding this work to focus on broader EDI issues in 2018.

1.1 Center-wide Goals for 2017: How did we do?

In the 2017 Center Workplan, we identified 11 goals for the year. As summarized below, we made significant progress on most of these goals, while several will remain a focus for 2018 (e.g. support to financial systems, position structures, and staff retreat).

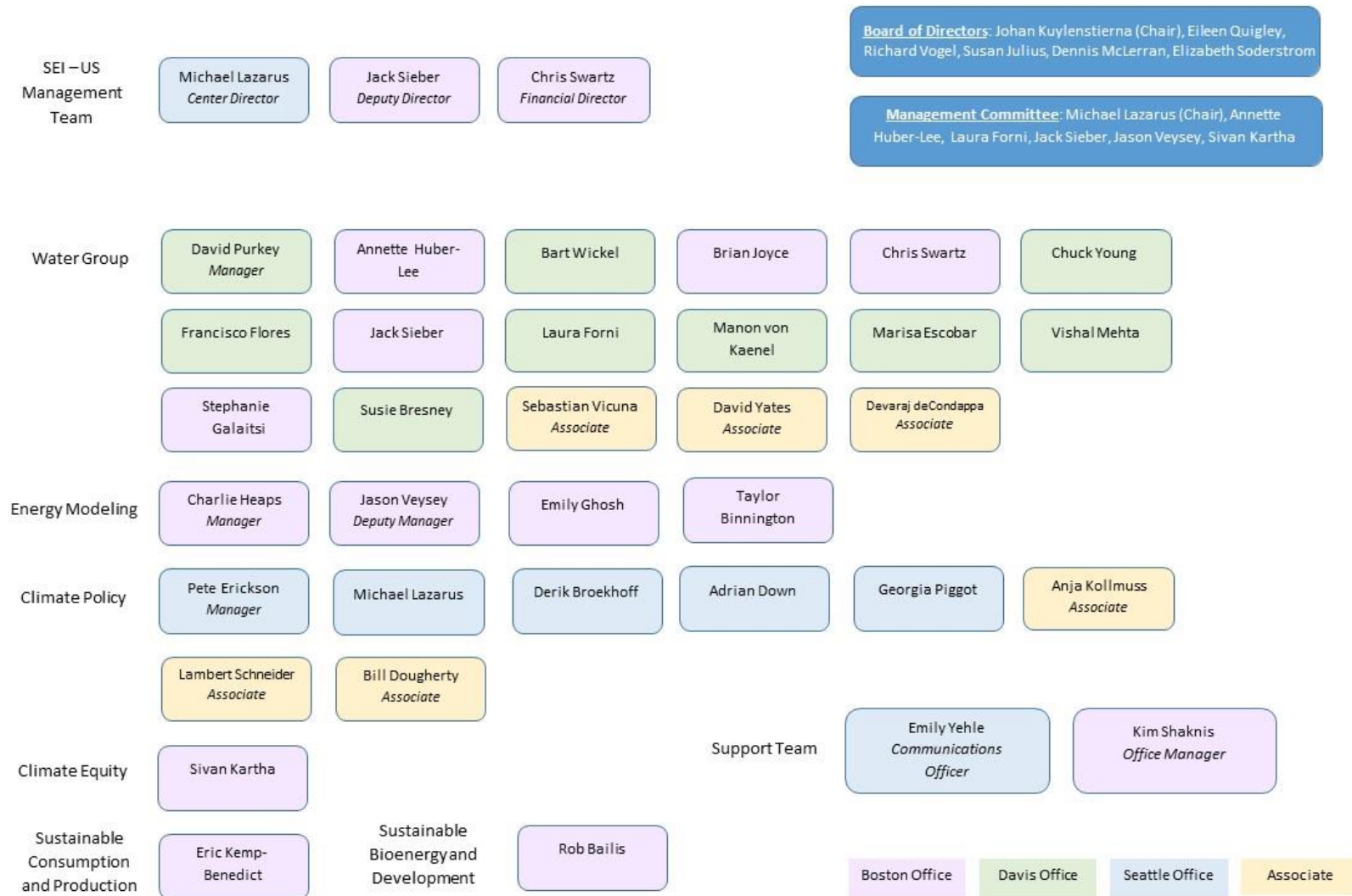
| 2017 US Center Goal | Update |
|--|--|
| 1. Enhance resilience of our administrative and financial capacities. Acquire additional administrative staff support. | <ul style="list-style-type: none"> - Progress on improving financial systems, including automation of timesheet data and added support by Kim with QuickBooks tasks - Hiring for fin/admin assistant on temporary hold |
| 2. Develop new funding streams and capacities. Take steps to help ensure that every program is thriving financially. | <ul style="list-style-type: none"> - Foundation fundraising plan developed - Phase 2 implementation underway |
| 3. Enhance communications support. | <ul style="list-style-type: none"> - Emily Yehle hired in June as new Communications Officer - Increased investment in communications by center and specific programs |
| 4. Begin to increase focus on longer-term financial planning. | <ul style="list-style-type: none"> - Paused temporarily, pending progress on Item 1 |
| 5. Achieve greater engagement with, and input from, the US Board. | <ul style="list-style-type: none"> - 2 new Board members added in 2017 - Increased engagement on fundraising and organizational support |

| 2017 US Center Goal | Update |
|---|--|
| 6. Revisit position descriptions and structure. | - Not yet started |
| 7. Explore possibilities to expand the diversity of program areas and capabilities at the Center. | - Added first sociologist in late 2016 |
| 8. Realize tangible benefits of the Center's Equity, Diversity and Inclusion Action Plan. | - Funded Women's Group activities in 2017 in support of gender equity goals - Continued tracking of plan progress |
| 9. Understand and address work-life balance questions. | - Discussions continued |
| 10. Continue to explore mentoring approaches. | - SEI-wide program now underway - Will revisit once lessons learned |
| 11. Plan and deliver a successful staff retreat and 10-year anniversary event. | - Successful anniversary event held in April - Retreat moved to 2018 |

1.2 Organization

SEI-US is established as a Massachusetts not-for-profit corporation formed under Chapter 180 of the Massachusetts General Laws. SEI-US is exempt from federal corporate income taxes, under section 501(c)(3) of the Internal Revenue Service code. SEI's U.S. Center is an independent research affiliate of Tufts University in Massachusetts and has offices on the Tufts campus in Somerville, Massachusetts, as well as in Davis, California, and Seattle, Washington.

SEI-US 2017 Annual Report



1.3 Staffing

SEI US currently comprises 28 staff (10 women, 18 men). Of those, 26 are researchers (17 senior scientists, 9 scientists and analysts, inclusive of communications), and two are financial and administrative staff.

We added one employee to our staff in 2017. **Emily Yehle** joined the Seattle office in May as the US communications officer. Her experience includes more than a decade as a reporter in Washington, D.C., covering Congress, politics, and energy and environmental policy-making.

After seven years at SEI, **Marion Davis** left to become the director of communications for the Massachusetts Immigrant and Refugee Advocacy Coalition. Marion was the senior communications officer at SEI-US, working as an editor, writer and publicist.

1.4 Finances

SEI-US throughput, as measured by total project-related revenue, rose to \$5.6 million in 2017, slightly higher than in 2016. Net assets increased as well, by approximately \$95,000, predominantly due to high staff billability. Of the total revenue accrued, \$1.4 million (about 25%) was obtained from efforts contributing to projects administered by SEI-International. The ratio of cash reserves to monthly expenses remained just over 6:1 by year-end, similar to 2016 and indicating continued stable cash flow from operations.

The sources of funding and the geographic regions of focus in our work remained similar to those in 2016. A breakdown of revenue (excluding that obtained through SEI International) by source of funding and geographic regions is provided in Figures 1 and 2 below. Contract and grant awards from government funding mechanisms continued to fund at least half of SEI-US researchers' activity, with U.S. federal and state sources again comprising almost \$2.0 million (each approximately \$1.0 million) and \$0.2 million derived from other governments. Foundations and research institutions/private entities each contributed 17% of revenue, while multilateral organizations (UN agencies) and development banks (e.g., World Bank) combined contributed 15%. U.S.-focused projects continued to provide the largest fraction of revenue (32%), and Latin America-, Asia- and Africa-focused projects each accounted for 12% to 16%. Projects with a European or Middle Eastern focus comprised less than 5% of the total effort.

Figure 1. SEI-US sources of revenue in 2017 (not including projects administered by SEI-International)

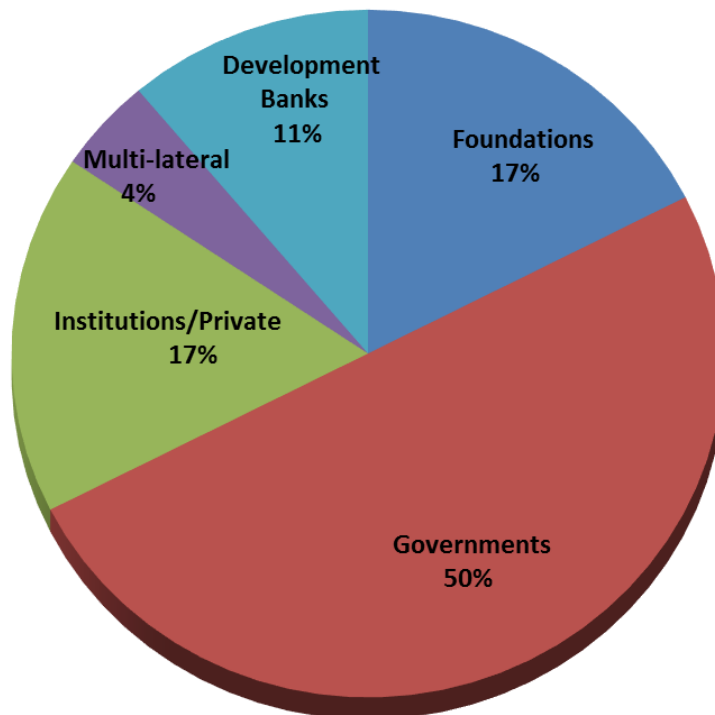
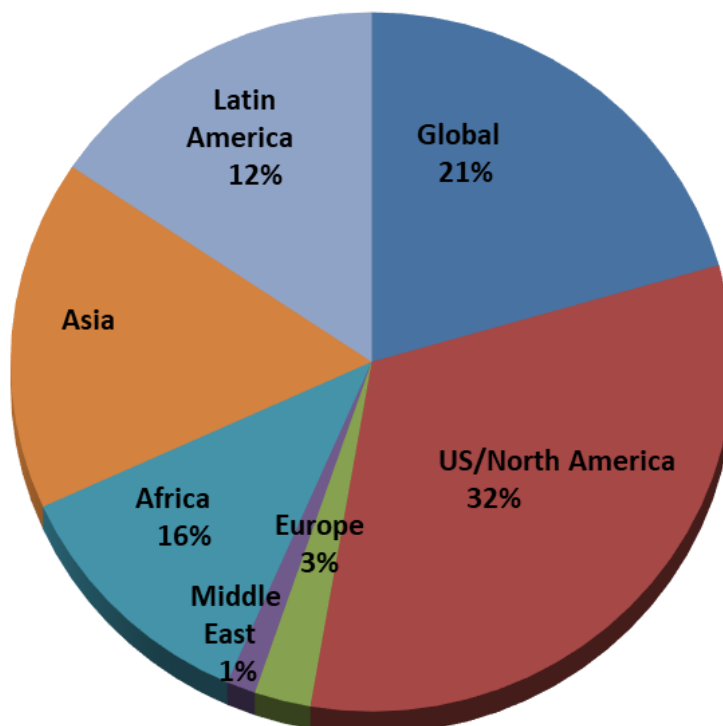


Figure 2. Geographic focus of SEI-US work in 2017 (by amount billed)



2 Project work

At SEI-US, we have a decentralized organizational structure in which each program designs, develops, and funds its own work. Below we review the highlights of 2017 project work by SEI-US program.

2.1 Water Program

2017 was a good year for the Water Group, in terms of meeting the goals set out in its 2017 Work Plan. We continued to improve our analytical tools, enjoyed substantial engagement within important water management decision-making processes, and began addressing the next big water management challenges.

With 12 researchers, the Water Group continues to be the largest research program within the U.S. Center, and the only research program with members working out of more than one office, with eight members in Davis and four in Somerville. We continue to maintain a balanced set of activities in California and internationally.



Figure 3. David Purkey and Manon von Kaenel (not shown) work with colleagues in La Paz on the issue of water the Bolivia National Water Balance.

In 2017, the Water Group started a leadership transition for the first time since SEI-US was created in 2006. David Purkey, the long-standing US Water Group Director, will take up his new position as the Center Director of a new SEI Latin America Center. In this transition, Marisa Escobar has assumed the position of Interim US Water Group Director, and was joined by Annette Huber-Lee and Chuck Young to form the leadership team. Marisa will focus on the day-to-day fundraising, human resources, strategic planning, and institutional engagement, while Annette and Chuck will provide support as needed on specific items related to these overarching management roles.

In California, we continued to provide modeling expertise to the State Water Resources Control Board through their SacWAM¹ update as it considers new in-stream flow regimes in the Sacramento Valley. SacWAM – or the Sacramento Water Allocation Model – is a hydrologic and system operations model developed by SEI and the State Water Resources Control Board using

the Water Evaluation And Planning (WEAP) software platform. It assesses potential revisions to requirements in the Bay-Delta Watershed, including the current update of the 2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary.

¹ https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/sacwam/

How does the centre work with gender mainstreaming and gender and social equality (GSE) considerations?

In 2017, SEI-US made substantive progress in integrating gender and social equity into our work.

The Water Group, for example, addressed gender and social equity in their modeling work, outlining two key goals: integration of gender and equity issues into the framing of the research questions and objectives and the social inclusion of women. It plans to publish a paper in 2018 on gender and social equity integration into water management. The Energy Modeling program is similarly working to complete training materials related to gender equity for energy and climate planners (for more detail, see Section 2.2).

The Sustainable Bioenergy & Development program works toward gender mainstreaming in its project activities through research methodologies designed to identify gender-specific outcomes. For example, household surveys implemented in India include questions about the degree of women's empowerment in order to understand whether women's independence and decision-making power plays a role in technology adoption leading to improved health and environmental outcomes.

The Climate Policy program launched a new effort, supported by the GSE program, in conjunction with SEI Asia and the Fossil Fuel Initiative that will examine the gender and social equity implications of just transitions policies, such as worker re-training and relocation programs, transition services, and grants and payments for fossil-fuel industry workers facing job loss. Together with the Equitable Transitions program, we made plans to begin a project focused on fairness for fossil-fuel-dependent workers, communities and economies.

Describe how the work of the centre is of relevance to sustainable development and/or multidimensional poverty alleviation in low-income countries?

Much of the Center's work relates to these goals. The Energy Modeling program, for example, focuses on capacity-building in developing countries, disseminating LEAP and holding numerous training workshops.

In 2017, the Equitable Transitions program documented and disseminated a model for economic scenarios in small island developing states (SIDS). The model was developed for the Caribbean as part of the Global to Local Climate Change Adaptation and Mitigation Scenarios (GoLoCarSce), and is intended for climate and economic vulnerability studies.

Sustainable development and poverty alleviation are also core elements of the Sustainable Bioenergy & Development program. The program works directly with people living in energy poverty, conducting policy-relevant research and seeking viable solutions. Examples include:

- A 3-year intervention in which aspirational household energy technologies are offered to Indian households living below the poverty line to determine their effect on energy use, pollution exposure, and quality of life among family members.
- A large-scale household survey in Kenya as part of a global effort led by the World Bank to determine the status of energy access in 15 countries and define a baseline for progress toward the achievement of SDG-7, including "universal access to affordable, reliable and modern energy services" by 2030.

An important milestone on this project was the peer review of the modeling work. The model will be used to overhaul the water rights structures in the state, in order to achieve a better balance between consumptive uses and aquatic ecosystems. This very high-profile engagement is raising the profile of the entire group across California. Also, we continued defining next steps towards building more focused watershed models.

On another set of activities in California, we worked with local stakeholders in Yolo County to initiate development of a groundwater sustainability plan in compliance with the Sustainable Groundwater Management Act. For this work, our researchers are helping California's Yolo County plan for an uncertain future, with our Robust Decision Support (RDS) framework. Using a stakeholder-driven process, the project will help Yolo County sustainably manage its basins. SEI will work with ERA Economics to develop a hydro-economic model that considers farmer attitudes on groundwater management, as well as future climate projections.

For the high-profile Department of Energy (DOE) project on water and energy in the US and China, the team held an RDS Problem Formulation Workshop. This workshop was held with the Water-Energy Team of the Climate Action Team (WET-CAT), with membership from a broad set of California state agencies, including:

- California Air Resources Board
- California Environmental Protection Agency
- California Department of Food and Agriculture
- California Department of Public Health
- California Department of Water Resources
- California Public Utilities Commission
- California Energy Commission
- California Natural Resources Agency
- Governor's Office of Planning and Research
- State Water Resources Control Board
- Strategic Growth Council

The plan of research based on this workshop will be presented by SEI in January of 2018. We have continued with outreach and partnership building in China. We have discussed collaboration around applying WEAP and LEAP for Beijing with Chinese colleagues across both government, non-government and university organizations.

Internationally, the Water Group innovated at the national level through its support of the Ministry of Environment and Water in Bolivia (MMAyA). Researchers created a hydrologic baseline of Bolivia through new WEAP models of the country's main watersheds. MMAyA is now able to use the resulting platform for future water management planning and decision-making. Also in Bolivia, the Water Group secured three more projects to support regional planning in the Rio Rocha and to support capacity-building efforts on climate grids.

The Water Group also finalized a stage of its project on informing better governance for urban sustainability in Bangalore, India. SEI has worked on the [Bangalore Urban Metabolism Project](#) (BUMP) since 2011. In the most recent phase, researchers sampled groundwater from 150 locations throughout the city, which they will use to inform a groundwater model. The

overall focus of the project is on increasing and integrating knowledge on the demand and supply side of Bangalore's waterscape.

The Water Group successfully launched the [Sustainable Water Partnership](#) (SWP) pilot in Cambodia, with the launch of the pilot in Tanzania/Kenya planned for February 2018. The SWP is a five-year Leader with Associates Cooperative Agreement that supports the U.S. Agency for International Development's (USAID) thought leadership, innovation and action in global water security by integrating water security issues into Mission programming through relevant, Mission-specific initiatives. The Water Group's role in this project is to experiment with novel approaches that prioritize participatory processes and identify strategies that work across a range of uncertainties.



Figure 4. Annette Huber-Lee at the SWP event “The Challenge of Too Much Water” in Washington²

We are thought leaders within very high-profile water management decision-making processes in California, and beyond. We have consolidated our position to respond to the emerging challenge of balancing the needs of water users and of aquatic ecosystems equally within over-allocated water systems. In 2017, we made progress towards our goals of (i) advancing our long-standing reputation for the development of innovative analytical tools; (ii) applying these tools within new formal decision-making constructs; and (iii) discovering the next set of challenges awaiting those who seek to manage water sustainably.

² https://www.newsecuritybeat.org/2017/10/sustainable-water-resilient-communities-challenge-water/?utm_content=buffer38d3e&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer

2.2 Energy Modeling (LEAP)

The Energy Modeling program remains focused on continuing to develop, disseminate and apply LEAP and related tools so that they can be useful to climate mitigation and sustainable energy planning practitioners around the world.

LEAP

In 2017, we continued to develop and support LEAP, SEI's software for energy and climate mitigation planning. We expanded the applicability of LEAP beyond the fields of energy policy and GHG mitigation modeling through the inclusion of new facilities for (1) modeling land-use change, forestry and disaggregated renewable resources and (2) new capabilities for modeling the health (mortality), ecosystem (crop loss) and climate (temperature change) impacts associated with the air emissions scenarios calculated in LEAP. This latter work was conducted in collaboration with SEI's York Centre and was supported by the Climate & Clean Air Coalition (CCAC). We launched a major new version of LEAP at the end of 2017, which included these features.

We will continue to work on improving LEAP in 2018, with the aim of making LEAP a complete GHG mitigation modeling tool that can be applied in both energy and non-energy sectors.

Capacity Building

We continued our efforts to build capacity for climate mitigation planning in 2017, supporting countries preparing NDCs, BURs, LEDS and other aspects of their contributions to the UNFCCC's Paris agreements. Aside from continuing to improve LEAP, we provided technical support via the LEAP website and organized numerous training workshops all around the world. In 2017 alone we conducted workshops in Chile, Cote D'Ivoire, Egypt, Georgia, Jordan, Kenya, Morocco, Peru, Philippines, Rwanda, Togo, and the Ukraine. In terms of technical support via the LEAP website, in 2017 we provided help to more than 138 practitioners. The overriding objective was to enable increased ambition in national mitigation commitments – particularly NDCs and LEDS – by reinforcing national modeling capacity; improving the quality, comparability, and transparency of national modeling analyses; and deepening the understanding of the relationship between national and global mitigation pathways. We also provided technical support to a number of other international climate programs including the EU's ECRAN programme, which is building capacity for climate planning in the Balkan and Black Sea regions and USAID's Clean Power Asia programme (as a subcontractor to Abt Associates), will be working to support countries in the Mekong region. We hope to scale-up these efforts in 2018, and are seeking additional funding to support those efforts.

LEDP

We are also excited to be continuing the SEI LEDP initiative. The initiative seeks to better integrate planning on long-range and short-range climate pollutants. In 2018, we will be continuing our efforts to develop a new energy technology database to support planning in LEAP and other tools; as well as developing a new urban scale version of LEAP-IBC.

Gender and Social Equity (GSE): In a program of work cofounded by the GSE and LEDP Initiatives, we will also be working to complete development of a new set of training materials focused on questions related to gender equity, which can be used to train energy and climate planners about these issues. The training materials will be tested and then integrated into our ongoing LEAP training efforts. The materials will be based on a literature review of how energy, climate and air pollution planning relate to gender equality. In the training materials, we aim to demonstrate how users can extract this information from the LEAP results and present it as a gender-related impact.

Communications

In 2017, we continued to communicate widely about our research, development and capacity-building activities. We attended the LEDS Global Partnership annual meeting in Berlin, the UNFCCC COP23 meeting in Bonn and the UN environment assembly in Nairobi. We also presented LEAP at a series of webinars organized by the UNFCCC and the LEDS-GP. The LEAP website and Facebook pages continue to grow in popularity due to intensive outreach. By the end of 2017, more than 36,000 people had joined the LEAP web site. LEAP is also being very widely applied. More than 200 papers were published in 2017 alone citing LEAP. We plan to continue and scale-up these activities in 2018. In particular, we are hoping that SEI will consider joining the NDC Partnership, which will allow us to more closely engage with the main institutions that are assisting countries to fulfill their Paris obligations.

2.3 Climate Policy (Seattle group)

In 2017, the Seattle program had successes in its core work on climate change mitigation policy, especially concerning the role of cities in achieving GHG emissions abatement at scale; our long-standing work on carbon markets and climate action planning; and supply-side climate policy as part of the SEI Initiative on Fossil Fuels and Climate Change.

We have also started moving in one new, exciting direction, concerning the role of citizen participation in environmental policy development, including policies intended to constrain the supply of fossil fuels. Motivated by the addition of a sociologist to our team, we have begun building towards new research inquiries that relate to how social movements contribute to, and ultimately shape, environmental governance and policy. This work has already included a journal article in *Climate Policy*, as well as an ongoing study into how citizen mobilization affected the passage of several landmark environmental policy decisions.

We have also continued to expand considerations of gender and social equity in our program's work. A new project will examine the equity implications of just transitions policies, such as worker re-training and relocation programs, transition services, and grants and payments for fossil-fuel industry workers facing job loss. If the initial phase is successful, we will aim to develop guidance documents for policymakers that can help them incorporate gender and social equity considerations in just transitions policies.

Key highlights of our work in 2017, by topic area, are summarized below.

Fossil fuels, supply-side climate policy, and carbon lock-in

This year has seen exciting new research and policy developments for the SEI Initiative on Fossil Fuels and Climate Change, which involves staff at multiple centres, and is housed here at the U.S. Center (co-led by Michael Lazarus and Harro van Asselt at SEI Oxford). The Initiative fully came to life in 2016, and then in 2017 found success as follows:

- **Fossil fuels became a focal point in the UNFCCC at COP 23**, which we attribute in part to SEI's research and presence at the COP. The UN Secretary-General Antonio Guterres called fossil fuel investments “bets on an unsustainable future that will place savings and societies at risk” in his high-level remarks. More than twenty countries announced a new global alliance to phase out coal. And closing statement of the Least Developed Countries Group (LDC) explicitly called for the planned 2018 Talanoa Dialogue to include “managing a phase out of fossil fuels.”

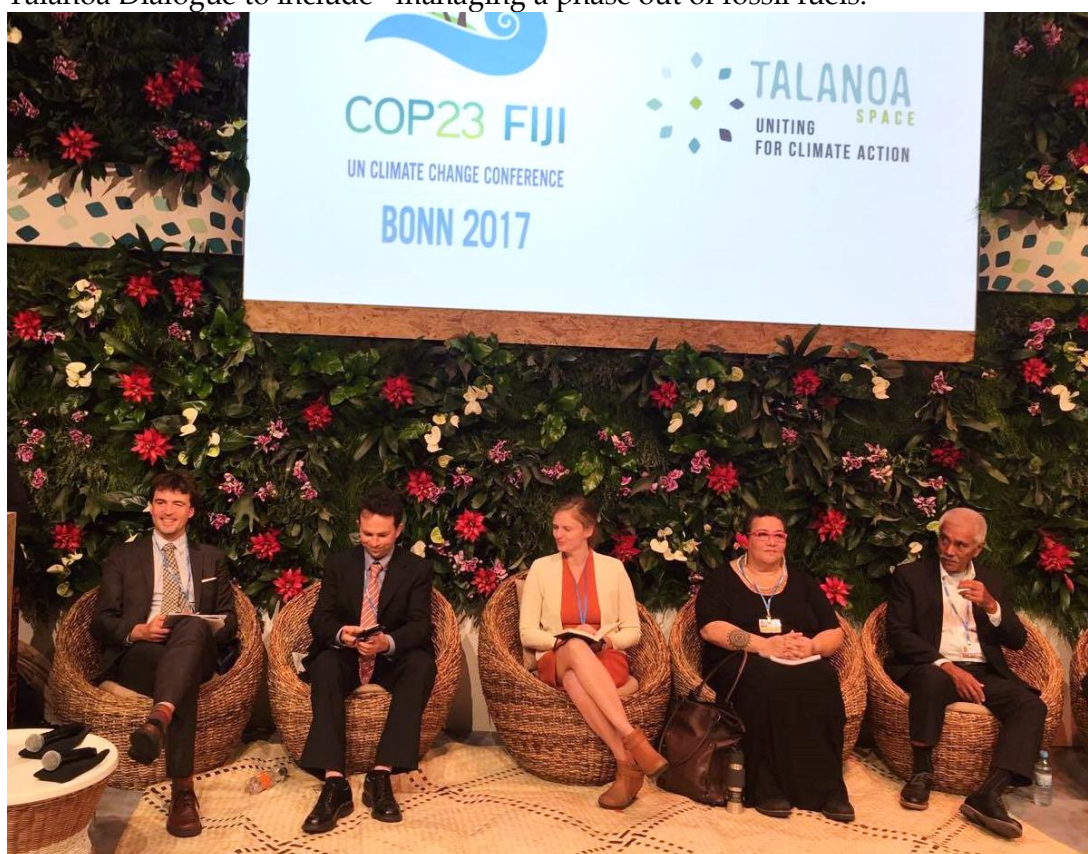


Figure 5. Peter Erickson (left) presented the new paper by Georgia Piggot et al.: “How to address fossil fuel production under the UNFCCC” at “A Pacific Talanoa on keeping fossil fuels in the ground” (8 Nov, 2017, Talanoa Space, COP 23 Bonn Zone)

- **The US State of California resolved to study supply-side climate policy.** In adopting its final climate scoping plan for 2030, the California Air Resources Board resolved to study supply-side climate policy, a development helped made possible by SEI's research, including new research in 2017 on oil production in California that will be published in early 2018.
- **SEI co-sponsored a research workshop on supply-side climate policy, held in the Lofoten islands of Norway.** SEI co-sponsored the workshop with CICERO and the University of Tromsø, which was attended by prominent scholars from Norway (e.g., Bard Harstad) and beyond. The day-long workshop explored the efficiency,

effectiveness, and equity dimensions of supply-side climate policy, and helped cement new collaborations.

- **We published several high-impact publications: two on Norway's oil, one on U.S. oil subsidies in *Nature Energy*, one on fossil fuels in the UNFCCC, and one on social mobilization in *Climate Policy*.** The study on Norway's oil led to a front-page story in the European edition of the *New York Times*, the U.S. oil subsidies study in *Nature Energy* led to stories in the *Washington Post*, *Guardian*, *Vox*, and many other news outlets; and the UNFCCC paper had immediate impact on the discussion at COP 23.

Other developments of note for the fossil fuel initiative include a continued partnership with the equity program, which is finalizing a major paper on the equity implications of supplying the fossil fuels for a diminishing carbon budget; and a number of blogs and opinion articles, including in *Climate Home*, *Texas Tribune*, Council on Foreign Relations (blog) and others.

Cities and climate change

The U.S. Center's work on city-scale GHG abatement in 2017 continued its global work (with funding from Bloomberg Philanthropies), while also starting an ambitious new U.S.-focused effort in partnership with NRDC. This year was a period of intensive research, which will set up two major reports to be released in 2018 – likely one at the World Urban Forum in Malaysia and the other at the Climate Summit in California in September 2018.

Highlights include:

- **Launching a major new research effort on U.S.-scale GHG abatement potential.** In the wake of a major change in federal US climate policy, states and cities must again assume leadership roles in climate policy and GHG emission reduction efforts. To support these efforts, SEI has partnered with NRDC to conduct an analysis of the GHG abatement potential of all US cities. The analysis is building from data assembled by the National Renewable Energy Laboratory (NREL) on energy use in over 20,000 U.S. communities, and will also be used by NRDC and other partners to support low-carbon city planning efforts in particular cities and regions. We will produce a major research report in 2018 based on this work.
- **Finalizing a major new research paper outlining the potential for national policy-makers to support low-carbon transitions in urban areas**, conducted as one of the central research products of the Coalition for Urban Transitions (CUTS), an effort related to the New Climate Economy. We expect to publish this paper with their support in 2018 and release it at the World Urban Forum in Malaysia. (Our work on this has been funded by Bloomberg Philanthropies). Work here also included SEI



Figure 6. A ferry boat docks near Svolvær, Norway outside the site of SEI's research workshop on supply-side climate policy.

staff presenting at a CUTS side event at COP 23 in Bonn as well as the publishing of a journal article in *Sustainable Cities and Society*.

- **Continuing to contribute to low-carbon planning efforts in particular regions,** including the Olympia (Washington) area and finalizing work on an evaluation of urban mobility programs Brazil, funded by CIFF.

Carbon pricing, carbon markets, and climate action planning

In 2017, we continued to play an important advisory role with policy-makers focused on carbon pricing and markets, with a special focus on the international carbon market. We worked with the World Bank's Partnership for Market Readiness to finalize guidance related to "scaled-up" crediting mechanisms under the Paris Agreement, as well as finalized a study for the Swedish Energy Agency and German Environment Ministry exploring environmental integrity and the possible development of trading systems under Article 6 of the Paris Agreement.

Highlights include:

- **Advising the Washington Governor's office as well as Seattle-based NGOs on carbon pricing, culminating in a new publication:** "Using carbon tax revenues to help attain climate goals: Insights for Washington State from existing programs". The paper explores a prevalent, but under-scrutinized, aspect of many carbon pricing policies: the investment of revenues in (additional) climate change mitigation actions. It highlights some pitfalls to avoid in the context of a proposed Washington carbon tax.
- **Publishing an analysis of the environmental integrity of international "transfers" of mitigation outcomes under the Paris Agreement.** The paper, "International transfers under Article 6 in the context of diverse ambition of NDCs: Environmental integrity risks and options to address them", explores how emissions trading can operate effectively and uphold the ambition of the Paris Agreement in a world where every country has committed to mitigation targets.
- **Completing a major paper with the World Bank Partnership for Market Readiness (PMR) on the design of new market-based mechanisms.** This work related to developing baselines for "scaled-up" crediting mechanisms (i.e., mechanisms that would issue tradable emissions credits for reductions achieved across whole economic sectors, or large groups of GHG sources, rather than for individual projects). The final paper – "Establishing Scaled-Up Crediting Program Baselines under the Paris Agreement: Issues and Options" – was published in 2017.

2.4 Equitable Transitions

The separate programs Climate Equity and Sustainable Consumption and Production are being combined in 2018 into a unified program called Equitable Transitions. For ease of reference, the activities under these two separate programs are brought together in this section.

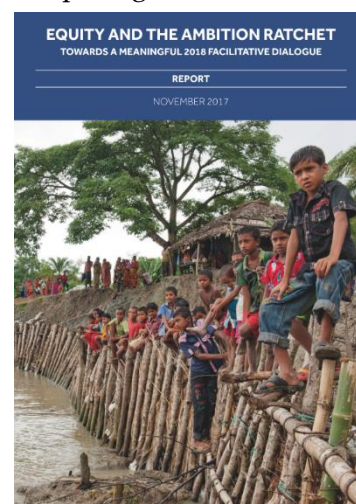
2.4.1 Climate Equity

The Climate Equity program's primary objective for 2017 was to provide analytical and intellectual input to a broad range of activities among Parties and civil society organizations focused on climate change, including those active in the UNFCCC domain, but working in domestic activities as well.

- **Contributing to a third annual process and high-profile report providing an effective science- and equity-based review of the national mitigation pledges.**

Nearly all UNFCCC Parties tabled pledges as part of the Paris Agreement, and a [broad coalition of civil society organizations](#) have collaborated to undertake a careful science- and equity-based assessment of them, with SEI serving a core role in convening the group, providing the analysis, and preparing the [report](#) on behalf of the coalition. The strategy underlying this objective has been that – with the largely bottom-up regime now in place – any effective process to ratchet up national-level ambition will require some means of reviewing the pledges, comparing them with the science-based demands of a pathway that keeps warming well below 2°C (and reflects efforts to keep warming below 1.5°C), and also comparing them with each other. With the Fiji/Bonn COP focused on kicking off the first round of reviewing and ratcheting up pledges, the civil society coalition analysis helped put the spotlight on the importance of rapidly increasing action in an equitable manner. The coalition involved in this effort comprised more than [170 global civil society organizations](#), including a large number of major groups such as WWF International, 350.org, International Trade Union Confederation, Climate Action Network International, Friends of the Earth, ActionAid, ACT Alliance, and others.

A [peer-reviewed journal article](#) was also published based on this work. Sivan joined several civil society partners to release this report at COP23 in Bonn.



- **Collaborating with faith-based organizations to build support for climate action.**



The recently issued Encyclical by Pope Francis was a passionate call for protection of the climate and the earth's ecosystems as a whole. Though ground-breaking in its message, *Laudato Si'* was deeply embedded in the Catholic tradition and resonant with the world's more than 1 billion Catholics. This year, SEI's Equity Program collaborated with CIDSE, an international coalition of Catholic social justice organizations active around the world, to help make the Pope's seminal contribution to Catholic doctrine more accessible to the laity. SEI wrote [Climate Action for the Common Good: Reflecting the principles of Laudato Si' in our transformative response to the climate crises](#), a report that distills the core principles embodied in the Encyclical, and translates it into specific recommendations for climate action that are effective,

equitable, and transformative. The report was released at COP23 in Bonn, and featured the Prime Minister of Tuvalu and a representative of the Holy See.

- The Climate Equity program continued to provide analysis related to the implications of key analytical findings relating to climate equity and development. Sivan published a journal article based on analysis of the implications of relying on negative emissions strategies – [Land-based negative emissions: risks for climate mitigation and impacts on sustainable development](#) – building on the earlier SEI report. He also has collaborated with a team of sixteen noted climate equity experts from across the globe in writing a critique on equity assessment of national mitigation pledges, submitted as a comment to Nature Climate Change. This has so far been strongly approved by the two reviewers, and already cited several times in the draft IPCC Special Report on 1.5C. (Final approval awaits the Editor’s decision.)
- The Climate Equity program released a distribution draft of an analysis, co-authored with Greg Muttitt of Oil Change International, on the equity implications of a rapid fossil fuel extraction phase-out. They held a feedback session at COP23 in Bonn, based upon which a final draft is to be released in Jan 2018.

2.4.2 Sustainable Consumption and Production

The Sustainable Consumption and Production program, led by Eric Kemp-Benedict, has taken a systems approach to better understand the impacts of policies and actions on sustainable consumption and production, including employment, investment, and economic growth.

The program focused on the conceptual and model development, and dissemination. These were reflected in a series of papers, conference presentations, and presentations at university departments, as shown in Figure 4. Two papers were published in peer-reviewed journals, one in January 2018 (the *B.E. Journal of Theoretical Economics and Economies*, an open-access journal). The others were released as conference papers or working papers. Four have also been submitted to journals and are currently under review.

Most of the papers are connected through the development of a macroeconomic model for the Producer to Consumer Sustainability (P2CS) initiative. Two papers – on pricing and technological change – establish basic results that are necessary for the model. This work also produced an ancillary paper on decoupling energy and resource use from economic growth. The model itself is being built for policy-relevant analysis, and the first example of these was a paper analyzing the macroeconomic consequences of “downshifting”. The paper describing the downshifting analysis was selected as one of the best papers at the International Conference on Sustainable Development in New York, and was published as part of a special issue consisting of papers from the conference.



Figure 7: Eric presenting at the International Conference on Sustainable Development.

A further paper describes a macroeconomic model for adaptation planning in small island developing states (SIDS). This is an explicitly policy-focused model, and was calibrated to Barbados, Jamaica, and Trinidad and Tobago as part of the Global to Local Climate Change Adaptation and Mitigation Scenarios (GoLoCarSce). The model was presented at the 21st FMM Conference, “The Crisis of Globalisation”, in Berlin. The FMM Conferences are the main venue for the heterodox macroeconomics community in Europe. The paper has been submitted to the *Journal of Post-Keynesian Economics*.

Finally, a paper on financial and investment consequences of a “green” transition that was presented in 2016 was invited to be part of a special issue in *Ecological Economics*. The paper is currently under review.

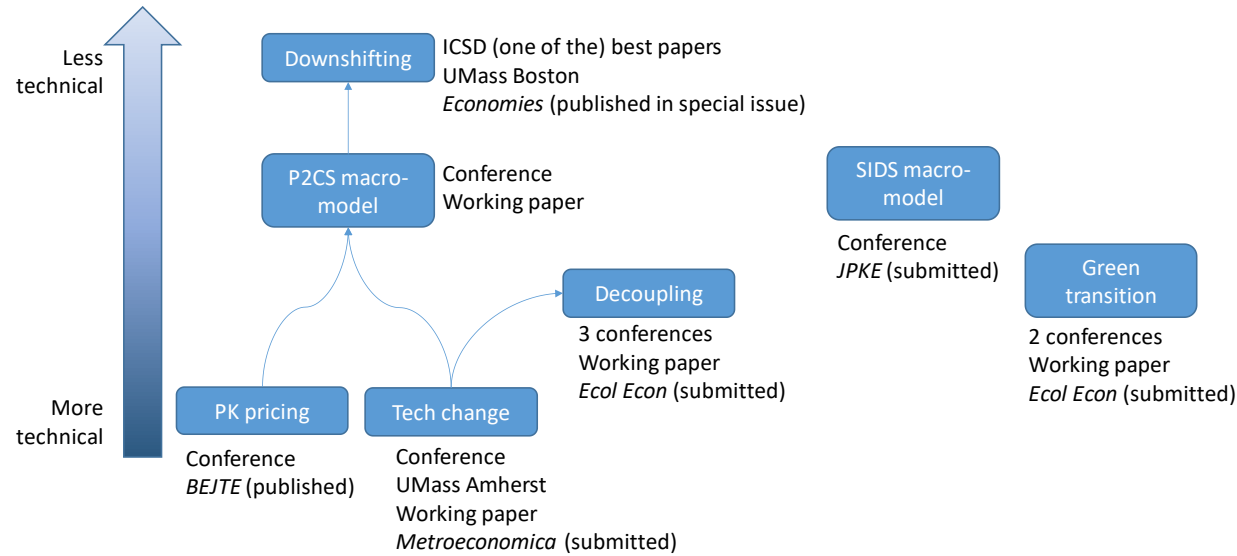


Figure 4: Relationship between papers and presentations in 2017.

2.5 Sustainable Bioenergy and Development

This program devoted much of 2017 to expanding links with existing SEI programs in other centers, while continuing to deliver on existing research grants and enhancing the policy impact of the program's research. By the close of 2017, the program was active in eight projects, five of which will be completed in 2018, and three of which will continue through 2019 and beyond (listed below). These projects build on the program's core mission to seek sustainable outcomes linked to the development of biomass energy.

| Project | Location | Funder | Closing |
|---|----------|------------|------------|
| Energy Access Multitier Framework Survey | Kenya | World Bank | Mar 2018 |
| Household Energy Intervention | India | US EPA | Aug 2018 |
| Adoption and Use of Advanced Woodstoves | Kenya | CCAC | July 2019 |
| Improved woodstove program evaluation | Honduras | Overlook | Dec 2018 |
| Woodfuel, landscapes, and climate change | Malawi | NSF | Sep 2020 |
| SEI Bioeconomy Initiative | Multiple | Core | Mar 2020? |
| TransRisk | Kenya | EU/Core | April 2018 |
| Study of Cambodia's National Biogas Program | Cambodia | NIH | Feb 2018 |

In addition to several proposals, the program's output included two peer-reviewed journal articles – both published in *Environmental Research Letters*, a top ranked environmental science journal. The program also published a UN FAO policy brief focused on sustainable wood energy in sub-Saharan Africa.

During 2017, Rob Bailis participated in several international conferences and workshops including one panel that he organized at the annual FLARE conference, which took place in Stockholm last June. In addition, he presented in several sessions at the Global Clean Cooking Forum, which is convened biannually by the Global Alliance for Clean Cookstoves (GACC). The 2017 meeting occurred in India, where one of the program's flagship projects is wrapping up. At this year's conference, Bailis had a 20-minute, face-to-face meeting with Dharmendra Pradhan, who oversees India's massive LPG subsidy program as the Minister of Petroleum and Natural Gas. Bailis discussed preliminary findings of his three-year stove adoption study.



Figure 8. Rob Bailis with co-PI Andy Grieshop (NC State) and the Himachal Pradesh-based field staff from his EPA project at the 2017 Clean Cooking Forum in New Delhi.

Looking ahead to 2018, the program has three main objectives: Continue to contribute to intellectual leadership on traditional biomass energy and environmental change; increase policy impact of the program's research by engaging more with the communications team and focusing more on policy-oriented output; and enhance ties to programs across SEI's centers through additional proposal writing, collaborations, and visits.

3 Delivering Results

3.1 Scientific research

3.1.1 How the centre has contributed to increase the quality and impact of SEI's scientific publications

As noted across Section 2, U.S. Center staff continue to publish widely, both in the peer-reviewed literature, and through SEI's and others' publication series. In 2017, SEI-US staff authored or co-authored more than 30 publications in 2015, including at least 10 articles in peer-reviewed journals, five SEI working papers, six SEI-branded briefs, and reports published with the World Bank and Oxfam. See Appendix for a full list.

Michael Lazarus also joined Harro van Asselt (SEI Oxford) in guest editing a special issue on Fossil Fuel Supply and Climate Policy. Publication of the issue – which will include three articles from SEI researchers – is due out in early 2018.

3.1.2 How the centre has contributed to SEI's ambition to become a global knowledge leader through the SEI Initiatives

The U.S. Center continues to house the SEI Initiative on Fossil Fuels and Climate Change, providing initiative leadership and financial management. Charlie Heaps co-leads the Low Emission Development Pathways (LED-P). Sivan Kartha co-leads the Gender and Social Equity Programme. Derik Broekhoff, with support from Pete Erickson, continues to coordinate cross-center efforts to develop a new Urbanization initiative. Various staff also contribute to other initiatives.

3.1.3 How the centre developed and deepened partnership agreements with universities and research centres.

We continue our close relationships with nearby universities (University of California–Davis, University of Washington, and Tufts University). Our closest connection remains with Tufts, which provides us with our office space in Somerville, as well as a number of other key services (e.g. library access). We actively engage with all three universities in a regular fashion. Annette Huber-Lee, Charlie Heaps, Sivan Kartha and other Somerville staff frequently lecture at Tufts. Michael Lazarus is adjunct faculty at the Evans School of Public Administration at the University of Washington.

In 2017, we also strengthened our connections with the Tufts Institute for the Environment (TIE), and organized an SEI-TIE joint symposium in April 2017. The event honored SEI-US's 10 years as an US legal entity and close partner with Tufts University. We also implemented a new joint fellowship program with TIE, with 2 interns joining us in 2017, and two more expected in 2018.

3.2 Policy engagement

3.2.1 How the centre has contributed to the development of SEI's approaches to policy engagement and influence

In 2017, the Center contributed to policy engagement and impact through a range of conduits:

- Across various projects, as highlighted in Section 2, we continue to engage directly with policy-makers, for example, advising the Washington Governor's staff on the design of proposed carbon tax legislation.

- We actively participated in a variety of policy forums from the UNFCCC/COP process (see impact story below), local and regional planning processes (e.g. California water planning), the Partnership for Market Readiness, the International Carbon Action Partnership, the Climate and Clean Air Coalition, Low Emissions Development Strategies meetings, the Global Alliance for Clean Cookstoves, and civil society initiatives (such as the Civil Society Equity Review). Descriptions and links can be found throughout Section 2 above.

3.2.2 How the centre has increased the capacity of SEI staff to work at the interface between science and decision-making

During 2017, we increased the capacity of staff to work at the interface between science and decision-making through investments in professional development, media training, communications training, including on how to formulate key messages for policy-makers, technical writing support, and support for publications.

3.3 Capacity development

Capacity development is a core element of SEI-US's work, and is embedded in much of our work. New initiatives and goals for this aspect of work are described in detail in Section 2 above.

As the developer of the WEAP modeling platform, the Water Group has long been engaged in capacity development around the use of the tool. These efforts have tended to focus on the organization of formal, in-person, multi-day training events and the development of the materials required to support these kinds of events. Over the past five years, the Water Group has been conducting online interactive training courses and has begun to develop some insights related to the best technologies and pedagogical techniques associated with these sort of capacity-building programs. While these so far have been for small groups (4-8 people per multi-day course), we are pursuing approaches to broaden their reach, including training videos, additional tutorial modules, and eventually the creation of an entire self-paced online course, combining written materials, example datasets, training videos and quizzes.

In addition, after a couple of years of experimentation, the Water Group has begun to consolidate around a set of specific steps related to implementing the WEAP-based RDS practice, including model ensemble automation and results visualization. This suggests that it would be a good time to begin to develop some specific capacity-building materials related the use of WEAP within this decision support framework. Here, the development of instructional videos could be a very promising approach.

Capacity-building is also a core focus of the LEAP energy modelling program at SEI-US, and our COMMEND website has now been used for over 15 years as a key platform in supporting developing country experts working on sustainable energy policy analysis. (See Section 2.2 for more specific capacity-building goals related to the energy modeling program.)

IMPACT STORY: ADDRESSING FOSSIL FUEL SUPPLY UNDER THE UNFCCC

There is growing acknowledgement that meeting the goal of the Paris Agreement to keep global warming “well below 2°C” will require a phase down of fossil fuel production. This requires new domestic and international policy approaches that focus on constraining fossil fuel supply and complement policies aimed at curtailing fossil fuel demand.

The SEI Fossil Fuels and Climate Change Initiative continues to provide research leadership and policy assessments that governments can use to address this fossil fuel supply challenge. These efforts include practical guidance on how the main intergovernmental venue for cooperation on climate change – the United Nations Framework Convention on Climate Change (UNFCCC) – could facilitate efforts to keep fossil fuel supply in line with global climate change goals.

For most of the twenty-five year history of the UNFCCC, the topic of fossil fuel production has been sidelined in global negotiations. Indeed, the phrase “fossil fuels” doesn’t appear in the text of the Paris Agreement, despite the obvious link between combustion of these fuels and climate change. However, as of the latest UNFCCC Conference of Parties (COP 23) in November 2017, the tide began to turn. The [UN Secretary-General Antonio Guterres](#) called fossil fuel investments “bets on an unsustainable future that will place savings and societies at risk”. More than twenty countries announced a [NEW GLOBAL ALLIANCE TO PHASE OUT COAL](#). And the [LEAST DEVELOPED COUNTRIES GROUP \(LDC\)’S CLOSING STATEMENT](#) explicitly called for the planned 2018 Talanoa Dialogue to include “managing a phase out of fossil fuels.”

SEI researchers have been raising the issue of fossil fuel supply in the UNFCCC since the inception of the Fossil Fuel Initiative. We have produced analysis, publications, op-eds, and presentations, as well as convened a conference and side events, that have helped shift the discourse on fossil fuels and climate change at COP. While this has been a sustained effort over the past three years, we gained noticeable traction at the 2017 COP in Bonn with a working paper, policy brief, and journal article that outlined the concrete steps that could be taken to address fossil fuel supply under the UNFCCC (see outputs below). NGO partners used these publications to inform country delegations about their options for tackling fossil fuel production – including LDC delegates who ultimately called for the inclusions of a fossil fuel phase-out in the Talanoa Dialogue.

We attribute this uptake of our work by NGOs and delegates to several factors aligning at the right time. First, through our work in the Fossil Fuel Initiative, we have built a network and reputation as research leaders on fossil fuels and climate change, which makes it easier disseminate our research and ideas through partners. Second, our publications emphasize tractable actions governments can take, in easily digestible formats (e.g. a brief and op-ed) that help audiences grasp the ideas. Finally, political circumstances at this particular COP – notably, the choice by the U.S. Government to host an event *promoting* fossil fuel production – significantly raised the profile of fossil fuels in discussions, which opened up space for the ideas to be heard.

IMPACT STORY: BOLIVIA NATIONAL WATER BALANCE

SEI-US provided Bolivia with the first comprehensive model of its rivers, lakes and streams. The model – built on SEI’s Water Evaluation and Planning system (WEAP) – enables the country to better assess current water availability and future water projections.

Bolivia faces a deepening water crisis, thanks to shrinking glaciers, extreme droughts and management challenges. In 2016, the country declared a state of emergency because of water shortages; earlier this year, its capital city suffered an historic drought. Agricultural communities are also facing the challenge of maintaining their livelihoods in the face of uncertain water availability.

The country is making efforts to improve water planning and build capacity in the regions so they can have better information about their water availability, current water uses and potential future developments.

Bolivia’s Ministry of Environment and Water engaged SEI to support the development of a national water balance built on the WEAP platform. The Ministry envisioned a uniform dataset that could act as a baseline to inform water planning in the different regions. To make sure that the tools were understood and available for water planners in the country, the Ministry and SEI organized a series of training and discussion sessions in 2017.

SEI unveiled the completed model in November 2017. The platform contains information about all available water supply in Bolivia, using data from field measurements and satellite records. In addition to the Ministry of Environment and Water, SEI collaborated with the Institute of Hydraulic and Hydrology from the San Andrés University and the Laboratory of Hydrology from the University of San Simón.

SEI used new computational methods, including automatic catchment delineation and gridded climate data, to bring the data together in a WEAP platform that allows all stakeholders – from the public to decision-makers – to participate in the ongoing conversation over water management.

While the public can access the [platform](#) through the web system “Geovisor,” researchers are able to continue to update and refine the model. SEI also developed training materials to replicate the capacity-building sessions.

One of the main outcomes of the work was the successful training of 40 Bolivian water planners who can now use WEAP and other data processing tools to assess current and future water availability.

The successful implementation of this project was due to the Ministry’s trust in SEI’s capacity to lead this effort. SEI was a catalyzer in order to bring together actors that normally don’t sit in the same room, such as researchers from competing academic organizations and from different regions of the country. This strong partnership ensured not only a strong model, but also a trusted one that has the buy-in of a diverse set of stakeholders.

IMPACT STORY: MODELING THE BAY-DELTA WATERSHED

SEI-US created a model to calculate the impacts to water users of in-stream flow requirements in the Sacramento Valley and Sacramento-San Joaquin Delta. The California State Water Resources Control Board is using the model – created in SEI’s Water Evaluation And Planning system (WEAP) – to revise the regulatory regime for the Bay-Delta watershed so it better reflects conditions suitable for important fish species.

Two of California’s largest rivers meet in the Sacramento-San Joaquin Delta, creating the West Coast’s largest estuary. The Delta is the hub of the state’s water system, providing water to more than 1 million acres of farmland and 22 million people. It is vitally important not only to California’s agriculture industry and its residents, but also to hundreds of species of wildlife whose ecosystems are collapsing.

The California State Water Resources Control Board is responsible for balancing these competing needs. It chose SEI and WEAP to build a simulation tool that allows users to explore the impacts of various water restrictions. Among the questions they needed answered: If more water is allocated to the environment, how will that impact farmers and cities?

Such impacts are hard to tease out because the system is a labyrinth of extensive infrastructure, complicated operating rules and numerous regulations. The Board chose WEAP for the task because it is user friendly and it facilitates transparent model construction. This will help stakeholders understand how the model was constructed and how to use it.

The resulting model – called SacWAM, or the Sacramento Water Allocation Model – also comes with a “new” feature: it allows the Board to create in-stream flow requirements that are based on the unimpaired flow of the streams. To do this, the Board is calculating what the flow would be without diversions, dams and other infrastructure. Then, it is using the model to explore the impacts to water users if various percentages of that unimpaired flow are left in the streams.

The result will be flows in streams and rivers that more closely mimic the natural variation in flow. This will be beneficial to the aquatic species that live in these areas and rely on those flows.

The change has not yet occurred on-the-ground, but an increase in stream flows is likely. Based on simulations in SacWAM, the Board has come up with recommendations that will be released in a report in the spring of 2018. The Board has the power to implement new regulations, or come to an agreement with water diverters on stream flow requirements.

The success of this project was helped by the experience of the SEI-US and its partners. The SEI-US Water Group includes both experienced modelers – including the developer of WEAP – and experts in the California water system. Very importantly, our partner at Stantec includes one of the premier water modelers in California. It’s a unique team that brings together a great tool, a great programmer and an in-depth knowledge of California water.

4 Enabling Results

4.1 Communications

SEI-US continues to be a leader in communications at SEI, publishing extensively, posting stories and Q&As regularly to the SEI website, and producing blogs and op-eds. After Marion Davis left in 2017, we hired a new SEI-US communications officer who has begun to build our researchers' communications capacities and scope out ways to reach diverse audiences through a range of channels. SEI's launch of a redesigned website in 2018 promises opportunities to expand this work.

In 2017, we produced numerous news articles and Q&As, as well as op-eds that appeared on Climate Home, the Seattle Times, the Texas Tribune and Nivela, among others. We also engaged with media outlets, attracting widespread coverage for the U.S. oil subsidies study in *Nature Energy*.

4.1.1 How the centre will support and enable staff to be better communicators, and mobilize the authentic and diverse voices within centre

Our new communications officer has had numerous one-on-one conversations in order to engage with all researchers – not just those who are seasoned communicators. These brainstorming sessions have served as a good entry point for staff who want to expand their communications capacity but aren't yet confident in their writing.

This has resulted in web stories and blogs that span across programs – including a recent story on a water model in Bolivia and another on Colombia's coal politics – and we are confident this momentum will continue in 2018.

As in the past, the Climate Policy team produced multiple opinion pieces and news stories, attracting media attention for their work. They also engaged in discussions on Twitter, increasing attention for their research. As more researchers join Twitter, we hope to encourage this type of social media engagement.

Broadly, we think a hands-on, personal approach to developing communications is best. Our communications officer aims to have ongoing conversations with all researchers, in order to constantly provide feedback, brainstorm stories and generally keep communications on researchers' radar.

4.1.2 How the centre will invest in more structured and pro-active planning for communications and policy engagement

We made some headway in 2017 in engaging communications staff in planning and proposal-writing, which has been a challenge in the past. Several researchers have asked the SEI-US communications officer to edit proposals – and have included communications in their budget planning. However, this is by no means universal.

The communications officer is also actively involved in the Center's effort to gain more foundation funding; this means close engagement with several programs and better knowledge of ongoing projects (and thus potential communications needs).

We hope to build on this progress in 2018.

4.1.3 How the centre will develop more targeted content and formats that better meet the needs of users

As noted above, SEI-US continued to be actively involved in SEI's online communications in 2017, regularly contributing to the website, publishing externally, and participating in social media (not only on Twitter, but also on Facebook, where Charlie Heaps' LEAP group is quite active: <https://www.facebook.com/groups/LEAPSoftware/>). These efforts have allowed us to connect with broader audiences and to make our work more accessible to non-experts.

We hope the new SEI website will provide another avenue for content that is engaging to researchers and non-researchers alike, and plan to incorporate more SEI photos in our publications and communications.

The SEI Initiative on Fossil Fuels and Climate Change and related projects were particularly productive in terms of communications activities. Of particular success this year was COP23, where the Initiative's work gained traction with a working paper, policy brief, and journal article that outlined the concrete steps that could be taken to address fossil fuel supply under the UNFCCC (see Impact Story above).

4.1.4 How the centre will deploy peer-reviewed output more effectively in order to further develop the credibility of SEI's communications

We succeeded this year in producing several website stories and Q&As based on peer-reviewed research, but we can still do much better. We hope to increase our media outreach with the aim of expanded coverage of our peer-reviewed work.

4.2 Tools, knowledge/capacity platforms and ICT

4.2.1 How the centre has advanced its efforts to develop and integrate SEI's analytical tools

In addition to advancements made within SEI's analytical tools (see Section 2), progress has been made in the integration of WEAP and LEAP for Nexus studies.

4.2.2 How the centre has made SEI's tools more accessible to policy-makers and stakeholders

Highlights in 2017 included:

- New version of LEAP with major new analytical capabilities including the new IBC module that assesses the avoided health (mortality), ecosystem (crop loss) and climate (temperature change) impacts of climate mitigation scenarios, and new capabilities for land-use change and forestry modeling.
- New version also includes new results visualization capabilities making it easier to use and has been updated to a 64-bit code base to support the creation of huge models.
- Numerous LEAP trainings in countries such as Chile, Cote D'Ivoire, Egypt, Georgia, Jordan, Kenya, Morocco, Peru, Philippines, Rwanda, Togo, and the Ukraine.
- Webinars on use of LEAP for the UNFCCC and the LEDS-Global Partnership.
- High level international fora to promote our tools and research including the annual LEDS-GP meeting in Berlin, COP23 in Bonn and the UN Environment Assembly in Nairobi, where we launched LEAP-IBC.

- Extensive communications via the LEAP website and the LEAP Facebook group. The website now has over 36,000 members in 195 countries and the LEAP FB page has over 1,300 members. The WEAP website has over 27,000 members in 185 countries.
- LEAP and WEAP are being used extensively. Google scholar shows that in 2017 more than 200 papers were published referencing LEAP, 152 referencing WEAP.
- New version of WEAP with automated download and processing of global land use and climate data to facilitate building catchment-based hydrological models.
- Several online interactive WEAP trainings for capacity-building.

4.3 Organisation and Finance

At the U.S. Center, nearly all fundraising activity occurs at the program level. This approach makes sense given that most programs work in distinct areas (e.g. energy or water) with limited overlap among funders. That said, there are important overlaps on occasion, and thus some coordination is needed, and occurs through informal conversations across program staff. As noted above, we also developed a new Center-wide foundation fundraising plan in 2017.

4.4 Monitoring and institutional learning

4.4.1 How the centre has worked to further embed the PMEC system within SEI's workflows

The U.S. Center continues to undertake efforts to improve staff use of PMEC.

4.4.2 How the centre has monitored, evaluated and learn from key project outcomes

Much of the monitoring, evaluation, and learning occurs at the program levels, where staff meet regularly to plan as well as to review project activities. On occasion, especially where problems are encountered, "post mortem" meetings may be held. We also use brown bag lunch presentations to share lessons more widely across the Center.

4.4.3 How the centre has developed and implemented relevant feedback processes between project activity and higher management

The U.S. Center has a risk management policy to ensure that the Management Committee is aware of any project risks, and can work together to mitigate them in advance. For projects over a certain size, project managers must complete a risk assessment form, which in turn the MC must review and approve.

Appendix: US Center Publications in 2017

Journal Special Issues

Special issue on Fossil Fuel Supply and Climate Policy, guest edited by Harro van Asselt and Michael Lazarus. *Climatic Change* (forthcoming), with following articles from SEI researchers:

- Erickson, P., Lazarus, M. (2018, forthcoming). Would constraining US fossil fuel production affect global CO₂ emissions? A case study of US leasing policy
- Kartha, S., Caney, S., Dubash, N. (2018, forthcoming). Whose carbon is 'burnable'? Equity considerations in the allocation of a 'right to extract'.
- Lazarus, M., van Asselt, H. (2018, forthcoming). Fossil Fuel Supply and Climate Policy: The Road Less Taken.

Journal articles

Erickson, P., Down, A., Lazarus, M., Koplow, D. (2017). [Effect of subsidies to fossil fuel companies on United States crude oil production](#). *Nature Energy*, online 2 October 2017.

Kemp-Benedict, E. (2017). [Dynamic stability of post-Keynesian pricing](#). *The B.E. Journal of Theoretical Economics*, online 24 February 2017.

Kemp-Benedict, E. And Ghosh, E. (2018). [Downshifting in the Fast Lane: A Post-Keynesian Model of a Consumer-Led Transition](#). *Economies* 2018, 6(1), 3. (Note: From the Special Issue [Selected Papers from the International Conference on Sustainable Development 2017, September 18-20, 2017 New York, USA](#))

Holz, C., Kartha, S., Athanasiou, T. (2017). [Fairly sharing 1.5: national fair shares of a 1.5 °C-compliant global mitigation effort](#). *International Environmental Agreements: Politics, Law and Economics*, online 19 August 2017.

Lee, C.M., Erickson, P. (2017). [How does local economic development in cities affect global GHG emissions?](#) *Sustainable Cities and Society*, 35, 626-636.

Piggot, G. (2017). [The influence of social movements on policies that constrain fossil fuel supply](#). *Climate Policy*, online 08 December 2017

Polpanich, O., Lyon, S. W., Krittasudthacheewa, C., Bush, A. L. and Kemp-Benedict, E. (2017). [Modelling impacts of development on water resources in the Huai Sai Bat sub-basin in north-eastern Thailand with a participatory approach](#). *International Journal of Water Resources Development*, 1–21.

Reznik, A., Feinerman, E., Finkelshtain, I., Fisher, F., Huber-Lee, A., Joyce, B., and I. Kan. (2017). [Economic implications of agricultural reuse of treated wastewater in Israel: A statewide long-term perspective](#). *Ecological Economics*, 135, May 2017, 222–233.

Schneider, L., Lazarus, M., Lee, C., van Asselt, H. (2017). [Restricted linking of emissions trading systems: options, benefits, and challenges](#). International Environmental Agreements: Politics, Law and Economics 17 (6), 883-898.

Spalding-Fecher, R., B. Joyce and H. Winkler. (2017). [Climate change and hydropower in the Southern African Power Pool and Zambezi River Basin: System-wide impacts and policy implications](#). Energy Policy, 103, April 2017, 84–97.

SEI publications

Working Papers:

Derik Broekhoff, Adrian Down and Michael Lazarus. (2017). [Using carbon tax revenues to help attain climate goals: Insights for Washington State from existing programs](#)

Georgia Piggot, Peter Erickson, Michael Lazarus, Harro van Asselt. (2017). [Addressing fossil fuel production under the UNFCCC: Paris and beyond](#).

Peter Erickson, Adrian Down, Michael Lazarus, and Doug Koplow. (2017) [Effect of government subsidies for upstream oil infrastructure on U.S. oil production and global CO2 emissions](#).

Stephanie La Hoz Theuer, Lambert Schneider, Derik Broekhoff and Anja Kollmuss. (2017) [International transfers under Article 6 in the context of diverse ambition of NDCs](#)

Nina Weitz, Claudia Strambo, Eric Kemp-Benedict, and Mans Nilsson. (2017). [Governance in the water-energy-food nexus: Gaps and future research needs](#)

Oliver Johnson, Cassilde Muhoza, Philip Osano and Sivan Kartha. (2017). [Catalysing investment in sustainable energy infrastructure in Africa: Overcoming financial and non-financial constraints](#)

Policy Briefs:

Georgia Piggot, Peter Erickson, Michael Lazarus, Harro van Asselt. (2017). [How to address fossil fuel production under the UNFCCC](#).

Peter Erickson, Adrian Down, Michael Lazarus, and Doug Koplow. (2017) [How would eliminating subsidies to the U.S. oil industry affect potential oil production and CO2 emissions?](#)

Discussion Briefs:

Susie Bresney, Angélica María Moncada Aguirre and Marisa Escobar. (2017). [How governance affects participation: Insights from water resources planning projects in Colombia and Peru](#)

Stephanie Galaitsi, Laura Forni and Emily Ghosh. (2017). [Improving gender inclusion in SEI's capacity building work](#).

Adrian Down and Peter Erickson. (2017). [Norwegian oil production and keeping global warming 'well below 2°C'.](#)

Peter Erickson and Adrian Down. (2017). [How tax support for the petroleum industry could contradict Norway's climate goals.](#)

Project Report:

Lambert Schneider and Stephanie La Hoz Theuer. (2017). [Using the Clean Development Mechanism for nationally determined contributions and international aviation.](#)

Guidance Document:

Marisa Escobar, Laura Forni, Emily Ghosh and Marion Davis. (2017). [Guidance materials for mainstreaming gender perspectives into model-based policy analysis.](#)

Fact Sheet:

Charles Heaps, Kevin Hicks, Johan C.I. Kuylensstierna, Chris Malley and Harry Vallack. (2017) [The Long-range Energy Alternatives Planning - Integrated Benefits Calculator \(LEAP-IBC\).](#)

Other (conference contributions, external reports, blogs, etc)

Book chapter:

Campiglio, E., Godin, A., Kemp-Benedict, E. and Matikainen, S. (2017). The tightening links between financial systems and the low-carbon transition. In *Economic Policies since the Global Financial Crisis*. International Papers in Political Economy. Palgrave Macmillan, Cham. 313–56. DOI:[10.1007/978-3-319-60459-6_8](#).

Blog:

Georgia Piggot. [Will Social Movements Focused on Fossil Fuel Supply Help Solve the Climate Crisis?](#) Climate Strategies Blog. 14 December 2017.

David Purkey (2017). [Hydraulic Despots and the Origins of Water Planning.](#) Sustainable Water Partnership.

Peter Erickson. [Final Obama administration analysis shows expanding oil supply increases CO₂.](#) SEI Blog. 30 January 2017

Op-eds:

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