

Noah Kittner

Assistant Professor

Environmental Sciences and Engineering
Gillings School of Global Public Health
Affiliated Faculty, Department of City and Regional Planning
Affiliated Faculty, Environment, Ecology, and Energy Program
University of North Carolina at Chapel Hill
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Education

- Ph.D. University of California, Berkeley, 2018
Energy and Resources
Dissertation: *Energy systems integration and innovation for a clean energy transition* (Chair: Daniel M. Kammen)
- M.S. University of California, Berkeley, 2015
Energy and Resources
Thesis: *Sustainable Electricity Options for Kosovo*
Readers: Daniel M. Kammen & Duncan Callaway
- B.S. University of North Carolina at Chapel Hill, 2011
Environmental Science (highest honors and distinction)
Concentration: Energy and Sustainability
Double Minor: Mathematics, Urban Studies and Planning
Senior Honors Thesis: *An Environmental Life Cycle Comparison of Crystalline and Thin-Film Photovoltaic Systems in Thailand*

Professional Experience

Employment and Academic Rank

- Assistant Professor, Environmental Sciences and Engineering, UNC, 2019 - present
Affiliated Assistant Professor, Department of City and Regional Planning, UNC, 2019 – present
Affiliated Assistant Professor, Environment, Ecology, and Energy Program, UNC, 2019 – present
Senior Researcher in Energy Systems Modeling, Group for Sustainability and Technology,
Department of Management, Technology, and Economics, ETH Zürich, Switzerland, 2018-2019
National Science Foundation Graduate Research Fellow, Energy Engineering, UC Berkeley, 2014-
2018
National Science Foundation Systems Approach to Green Energy – IGERT Fellow, UC Berkeley
2014-2018

Visiting Researcher, Energy Research Institute, Chulalongkorn University, 2013-2017; time split in Bangkok, Thailand and USA

Fulbright Research Fellow in Energy, Joint Graduate School for Energy and Environment, King Mongkut's University of Technology Thonburi and UNC, 2011-2012

Other Appointments

Faculty Mentor, UNC MPH Program, Health Equity, Social Justice and Human Rights Concentration 2019-present

Honors

UNC Junior Faculty Development Award, 2020

Energy Innovation Policy and Management Scholar, Information Technology & Innovation Foundation, 2019

Robert Bosch Stiftung Foundation, Postdoc Academy for Transformational Leadership – *declined*, 2019
Tsinghua University, Energy, Climate, and Sustainability Award

National Science Foundation Graduate Research Fellowship, 2014-2018

NSF SAGE-IGERT Award, Berkeley Center for Green Chemistry, 2014-2018

SAGE Berkeley Center for Green Chemistry International Travel Award, 2014, 2015

Art Rosenfeld Award for Energy Efficiency, Berkeley Energy and Climate Initiative, 2015

National Go Solar Foundation Graduate Award, 2014

DIL Explore, UC Berkeley, 2013

Fulbright US Student Program, US State Department, 2011-2012

FLAS Fellow, Thai Language, University of Wisconsin, 2011

UNC Class of 1938 Fellow, Kampala, Uganda, 2010

UNC Institute for the Environment Bill Glaze Award for Environmental Science, 2009

Memberships

Sustainability Transitions Research Network, IEEE Power and Energy Society Sustainable Energy Systems for Developing Countries Working Group's Task Force on Sustainable Microgrids, REN21 Global Status Report, AGU 2018, ACS

ERG Committee for Equity, Inclusion and Diversity, 2015-2017

Bibliography

Peer Reviewed Journal Publications

(<https://orcid.org/0000-0002-3449-7823>)

(*indicates corresponding author; ** indicates student or mentee)

15. Markard, J.*, Bento, N., **Kittner, N.**, Nunez-Jimenez, A. (2020). [Destined for decline? Examining nuclear energy from a technological innovation systems perspective](#). *Energy Research & Social Science*, 67, 10152.

14. Schmitt, R.J.P.*, **Kittner, N.***, Kondolf, G.M., Kammen, D.M. (2019). [Deploy diverse renewables to save tropical rivers](#). *Nature*, 569, 330-332.

13. Huang, Y.W.**, **Kittner, N.***, Kammen, D.M. (2019). [ASEAN Grid Flexibility: Preparedness for Grid Integration of Renewable Energy](#). *Energy Policy*, 128, 711-726. (undergrad mentee)

12. **Kittner, N.**, Fadadu, R.***, Buckley, H., Schwarzman, M., Kammen, D.M. (2018). [Trace metal content of coal exacerbates air pollution-related health risks: the case of lignite coal in Kosovo.](#) *Environmental Science and Technology*, 52, 2359-2367.
11. **Kittner, N.** & Kammen, D.M. (2018). [A battery of innovative choices—if we commit to investing.](#) *Bulletin of the Atomic Scientists*, 74(1): 7-10.
10. Jagger, P., Sellers, S., **Kittner, N.**, Das, I., Bush, G. (2018). [Looking for Medium-term Conservation and Development Impacts of Community Management Agreements in Uganda’s Rwenzori Mountains National Park.](#) *Ecological Economics* 152, 199-206.
9. Sunter, D., Ferrall, I., Knapstein, J., Garfield, D., **Kittner, N.**, Kammen, D.M (2018). [Quantifying innovation patterns in next generation photovoltaics.](#) *IEEE PVSC*.
8. **Kittner, N.**, Lill, F., Kammen, D.M. (2017). [Energy storage deployment and innovation for the clean energy transition.](#) *Nature Energy* 2, 17125.
7. Jagger, P., **Kittner, N.** (2017). [Deforestation and Biomass Fuel Dynamics in Uganda.](#) *Biomass & Bioenergy* 105, 1-9.
6. **Kittner, N.**, Dimco, H., Azemi, V., Tairyan, E., Kammen, DM. (2016) [An analytic framework to assess future electricity options in Kosovo.](#) *Environmental Research Letters*. 11(10), 104013.
5. **Kittner, N.**, Gheewala, S.H., Kammen, DM. (2016) [Energy return on investment \(EROI\) of mini-hydro and solar PV systems designed for a mini-grid.](#) *Renewable Energy*, 99, 410-419.
4. Tongsopit, S., **Kittner, N.**, Chang, Y., Aksornkij, A., & Wangjiraniran, W. (2016). [Energy security in ASEAN: A quantitative approach for sustainable energy policy.](#) *Energy Policy*, 90, 60-72.
3. Kammen, D.M., **Kittner, N.** (2015). [Energy in the Balkans.](#) *Economist* (UK), 411 (8951), 10 September 2015.
2. **Kittner, N.**, Gheewala S.H., Kamens, R., (2013). [An Environmental Life Cycle Comparison of Single-Crystalline and Thin-Film Photovoltaic Systems in Thailand.](#) *Energy for Sustainable Development*, 17(6): 605-614.
1. **Kittner, N.** Gheewala S.H., Kamens, R., (2012). [Life Cycle Considerations for Monocrystalline Photovoltaics in Thailand.](#) *Journal of Sustainable Energy and Environment*, 3: 143-146.

Featured in News Media: [Al Jazeera](#), National Geographic Energy Blog, Forbes, Huffington Post, IEEE Spectrum, New York Times, PV Magazine, Think Progress, Green Tech Media, Vox, S&P Global Intelligence, Wall Street Journal, Clean Technica, Solar Magazine

Peer Reviewed Journal Publications – Under Review

Del Barrio-Alvarez, D., **Kittner, N.**, Sugiyama, M., Kammen, D.M. The benefits of an aggressive solar energy pathway for Myanmar. Under Review in *Solar Energy*.

Kittner, N. & Kammen, D.M. Energy systems integration and innovation for economies in transition.

Under Review in *Environmental Research Letters*.

Schmitt, R., **Kittner, N.**, Kondolf, G.M., Kammen, D.M. Strategic renewable energy systems planning to preserve Asia's last free flowing rivers. In prep for *PNAS*. [AGU Fall 2018 Meeting](#).

Tongsopit, S., Junlakarn, S., **Kittner, N.**, Saelim, S. A cross-country comparison of distributed photovoltaics policies in Southeast Asia: future outlook and remaining challenges. In prep for *Renewable Energy*.

Kittner, N., Tongsopit, S. Advanced solar PV manufacturing and deployment strategy in Thailand. In prep for *Renewable & Sustainable Energy Reviews*.

Scolaro, M., **Kittner, N.** Optimizing investments in hybrid offshore wind farms. In prep for *Applied Energy*.

Kittner, N., Vachet, P., Knoeri, C. The increasing share of soft costs and their learning in residential and utility-scale solar PV. In prep.

Peschel, J., **Kittner, N.** Adoption barriers for electric vehicles in Switzerland.

Eyring, N., **Kittner, N.** High-altitude floating solar photovoltaic potential in Switzerland.

Books, Chapters, and Reports

Kittner, N.*, Schmidt, O., Staffell, I., Kammen, D.M. (2020). [Technological learning for grid-scale energy storage](#). In: *Technological Learning in the Transition to a Low-Carbon Energy System*. Editors: Junginger, H.M., Louwen, A.

Kittner, N.*, Tsiropolous, I., Tarvydas, D., Schmidt, O., Staffell, I., Kammen, D.M. (2020). [Technological learning and experience curves for electric vehicles](#). In: *Technological Learning in the Transition to a Low-Carbon Energy System*. Editors: Junginger, H.M., Louwen, A.

Jagger, P., R. Bailis, A. Dermawan, **N. Kittner**, and R. McCord. (2019). [SDG 7: Affordable and Clean Energy – How Access to Affordable and Clean Energy Affects Forests and Forest-Based Livelihoods](#). In *Sustainable Development Goals: Their Impacts on Forests and People*. P. Katila, C.J.P. Colfer, W. de Jong, G. Galloway, P. Pacheco and G. Winkel, G. (eds.) Cambridge, UK: Cambridge University Press.

Kittner, N. et al. (2018). [Electricity Futures in the Greater Mekong Subregion: Towards Sustainability, Inclusive Development, and Conflict Resolution](#). Editors: Yoshikawa, H. & Anbumozhi, V. ERIA-RPR-2017-8. Chapters 1,3,7.

Avila, N.*, **Kittner, N.***, Shirley, R.*, Dwyer, M.B., Roberts, D., Sager, J., Kammen, D.M. Beyond the battery: [Power expansion alternatives for economic resilience and diversity in Lao PDR](#). *Forthcoming*. Harvard Kennedy School Ash Center Vietnam Program. In: *Resource Governance, Agriculture and Sustainable Livelihoods in the Lower Mekong Basin*, ed. Le Viet Phu, Nguyen Van Giap, Le Thi Quynh Tram, Chu Thai Hoanh and Malcolm McPherson (Petaling Jaya: SIRD; Lower Mekong Public Policy Initiative, 2019), chapter 2. *authors contributed equally

Kittner, N. & Yamaguchi, K. (2017). [Hydropower threatens peace in Myanmar—but it doesn't have to](#). *Nikkei Asian Review*.

Gheewala, S.H., **Kittner, N.**, Shi, X. (2017). [Costs and benefits of biofuels in Asia](#). In: *Routledge Handbook of Energy in Asia*. Editor: Bhattacharyya, S. Chapter 24.

REN 21 [2017 Global Status Report](#) Country Lead (Noah Kittner): Kosovo, Lao PDR .

Kittner, N., Kammen, D.M., Tankosic-Kelly, G., Rankovic, A., Taso, N. (2016). [South East Europe: The EU Road or Road to Nowhere? An energy roadmap for 2050: Technical analysis](#). SEE Change NET. Energy Community, European Commission.

Tongsopit, S., Chaitusaney, S., Limmanee, A., **Kittner, N.**, Hoontrakul, P. (2015). [Scaling Up Solar PV: A roadmap for Thailand](#). Thai Ministry of Energy, Chulalongkorn University.

Edie, S., Evans, T., **Kittner, N.**, Mui, A. (2010). Solar Photovoltaic Suitability for the Campus of the University of North Carolina at Chapel Hill. Unpublished report.

Editorials in Popular Media

Kittner, N. & Tongsopit, S. (2019). [Demystifying the road to clean air](#). *Bangkok Post*.

Kittner, N. (2018). [Energy and Peace: Can the two co-exist in Myanmar?](#). *WLE Thrive Blog*. CGIAR Program on Water, Land and Ecosystems.

Kittner, N. & Tongsopit, S. (2018.) [Thailand to Taiwan: Look to Renewable Energy and Storage](#). *The News Lens*. Taiwan.

Kittner, N. & Kammen, D.M. (2018). [Misplaced Praise](#). *Transitions Online*.

Tongsopit, S. & **Kittner, N.** (2017). [Nation lacks a coherent solar strategy](#). *Bangkok Post*.

Kittner, N. (2015). [กรณีโคโซโว พลังงานหมุนเวียนราคาถูกกว่าถ่านหิน](#) . In the case of Kosovo, renewable energy is cheaper than coal. *Thai Publica*. Translation assistance: Yanyong Boon-Long.

Research Grants

Pending

NASA, Terrestrial Hydrology, Kittner PI, with Venkataramana Sridhar, Virginia Tech, \$750,000/3 years, due Nov. 14, “Satellite-based hydrologic dynamics, nighttime lights, and hydropower operations in the Mekong River System and Tributaries”

NSF, \$249,000/3 years, Kittner PI, “Collaborative Research: INFEWS:US-China: Modeling the technological synergies and resilience of hydropower FEW systems in the Lancang-Mekong River Basin”

V. Kann Rasmussen Foundation, \$4,000,000/3years, Kittner PI, “Petrochemicals and Climate Change”

California Energy Commission, \$250,000/3 years, Kurtz UC Merced, Kittner Co-PI, “Modeling Long Duration Storage for Decarbonization of California’s Power System”

STRIDE, \$75,000, Kittner/Kaza, “Transit services and congestion mitigation in the Southeast”
US EPA, GSA EMAQ 4-23-2020, Investigator, PI: Sarav Arunachalam

Current

UNC Junior Faculty Development Award, \$10,000, Jan. 1, 2020-Dec. 31, 2020

UNC Center for Galapagos Studies, \$5,000 Faculty Seed Grant, Jan. 1, 2020-Dec. 31-2020.

Previous

Policy Alternatives Research Institute, University of Tokyo, \$200,000 2016-2018, total. Sustainable energy futures in Myanmar and GMS. PI: Kammen, Role: Co-researcher

Lower Mekong Public Policy Initiative, \$89,267.40, total. PI: Kammen, Role: Co-researcher

SEE Change Net, \$50,000, total. Renewable and Appropriate Energy Laboratory. South East Europe Energy Model, SEE Change NET, Sarajevo, Bosnia & Herzegovina, Role: Deputy Technical Lead

Rockefeller Brothers Foundation, Energy Investment Options for Kosovo, Renewable and Appropriate Energy Laboratory, Researcher, \$80,000, PI: Kammen, Role: Co-researcher

Development Impact Lab, USAID Explore Grant, \$5,000, Kittner, Developing Solar PV for Thai Communities

Class of 1938 Travel Fellowship, Kampala, Uganda, \$4,500, 2010

Teaching Activities

Courses Taught: University of North Carolina

ENVR 695 Independent Study, Department of Environmental Sciences and Engineering
2 undergraduate students enrolled in independent study. Spring 2020

ENVR 403 Environmental Chemistry, Department of Environmental Sciences and Engineering
Instructor: Surratt, J. (two guest lectures on Energy and Climate, Kittner). Spring 2020

Courses Taught: ETH Zürich, Switzerland

D-MTEC Corporate Sustainability, Technology Track (25 students) Fall 2018

Energy Innovation and Management, Energy Modeling Seminar (20 students) Spring 2019

Courses Taught: UC Berkeley

ER 292A Tools of the Trade, Energy and Resources Group (15 students). Fall 2015

CHEM 234 – Green Chemistry: An Interdisciplinary Approach to Sustainability

UC Berkeley, Spring 2016. Guest Lecturer for Life Cycle Assessment. Instructors: McKeag, Schwarzman, and Buckley. (15)

VME 057B – Global Population, Health, and Environment

UC Davis, online, Spring 2018. Guest Lecturer for Environmental Health. Instructor: Smith, W. (20)

Chulalongkorn University – Energy Systems Modeling Seminar

Fall 2016. Taught and Prepared Interactive Lectures on Energy System Planning Models
MS in Energy Technology Management Program (35)

Advising Activities***PhD Advisor UNC***

Rui Shan, Environmental Sciences and Engineering (starting Fall 2020-)
Ying Yu, Environmental Sciences and Engineering (starting Fall 2020-)
Amanda Ullman, City & Regional Planning, co-advise with Allie Thomas (starting Fall 2020-)

MS Advisor UNC

Eric Scheier, MS Student, Environment, Ecology, and Energy Program (E3P) (Spring 2020-)
Keerthana Vellayapan, MS Student, Environmental Sciences and Engineering (starting Fall 2020-)
Nan Sun, MS/MCRP dual degree student (starting Fall 2020-)
Miguel Rozo, MA Student, E3P, Rotary Peace Fellow, (starting Fall 2020-)
Andrew Zalesak, MS, Environmental Sciences and Engineering (starting Fall 2020-)

Mentored Undergraduate Research UNC

Austin Snyder, BS, Environmental Science (Optimal energy storage for deep decarbonization), 2019-20
Eugene Kang, BA, Urban Planning minor (Political economy of coal in Kosovo), 2019-20

MS Committee UNC

Joy Hill, MS Student, Environmental Sciences and Engineering (Spring 2020-)
Rosa Cuppari, MS Student, Environmental Sciences and Engineering (Spring 2020-)

PhD Committee UNC

Alejandro Valencia Arias, PhD Student, Environmental Sciences and Engineering
Kathleen Mulvaney, PhD Student, Environmental Sciences and Engineering

Faculty Mentor MPH@UNC

Michael Mallory, MPH Student, Health Equity, Social Justice and Human Rights Concentration
Meki Shewangizaw, MPH Student, Health Equity, Social Justice and Human Rights Concentration

MS Advisor ETH Zürich (2018-19)

Michele Scolaro, MSc, Energy Science and Technology, *Optimizing investments in hybrid offshore wind farms: a case study for Germany*

Paulina Vachet, MSc, Energy Science and Technology, *The increasing share of soft costs and their learning in residential and utility-scale PV*

Srivaishnavi Kalahasti, MAS, Management, Technology, and Economics, *Cost-competitive electric vehicles*

Jonas Peschel, MSc Management, Technology, Economics, *Electric mobility diffusion*

Nicholas Eyring, MSc Management, Technology, Economics, *Development and impacts of high altitude and floating solar photovoltaics*

Senior Thesis Advisor UC Berkeley (2016-2018)

Nicole Huang, BS Environmental Sciences, ASEAN Grid Flexibility: Preparedness for Integration of Renewable Energy, published in *Energy Policy*

Raj Fadadu, BSPH Public Health, Air-Pollution-Related Health Risks of Trace Metals in Coal, published in *Environmental Science and Technology*

Review Service

Environmental Science & Technology, Energy Conversion & Management, Energy Policy, Energy Reports, Energy Research & Social Science, Energy for Sustainable Development, Environmental Innovation and Societal Transitions, International Forestry Review, Journal of Cleaner Production, Journal of Sustainable Forestry, Renewable Energy, Science of the Total Environment, The International Journal of Life Cycle Assessment, Urban Planning, Utilities Policy, World Development Perspectives, IRENA, IEA Energy Technology Perspectives, Project Drawdown

Products of Engaged Scholarship

Public Presentation

UN Environment, Innovative Solutions to Pollution in South East and Southern Europe, Belgrade, Serbia, 2018

USAID Clean Power Asia and Philippines Department of Energy, 2018

9th US-Vietnam Science & Technology Joint Committee Meeting (US State Department) representing US Higher Education, 2015

Thailand Ministry of Energy 2017, 2018

PTIT, Thailand 2017, 2018

Asia Clean Energy Forum, Speaker, Asia Development Bank, Manila, PH June 2016

World Bank Annual Meetings, 2014-2016

Invited Lectures and Seminars

International Energy Agency, Energy Technology Perspectives Energy Storage, Paris France, 2019

Greater Mekong Subregion Academic Research Network Meeting, Luang Prabang, 2019

Huazhong Agricultural University, Wuhan, China, 2019

Hong Kong University of Science and Technology, Department of Public Policy, Hong Kong, 2019

University of British Columbia, Department of Wood Science, Vancouver, Canada, 2019

Barnard College, Department of Environmental Science, 2019

University of North Carolina, Environment, Ecology, and Energy Program, 2019

University of Florida, Engineering School of Sustainable Infrastructure and Environment, 2019

Mercator Research Institute on Global Commons and Climate Change, Berlin, 2019
Xi'an Jiatong University, Keynote Nanotechnology, Renewable Energy, and Sustainability, 2019
The Graduate Institute, Geneva, Centre for International Environmental Studies, 2019
PACT, Cumulative Impact Assessment on Lower Mekong Regional Water and Energy Infrastructure
Development and Planning, Chiang Rai, Thailand, 2018
ETH Zürich, Department of Management, Technology, and Economics, 2018
Tsinghua-Berkeley Shenzhen Institute, Environmental Science and New Energy Technology, 2018
University of San Francisco, Energy Systems Management, 2018
TU Delft, Technology, Management, and Policy Seminar, 2018
UC Berkeley, Energy and Resources Group Colloquium, 2018
University of Illinois Urbana-Champaign, Civil and Environmental Engineering, 2018
3rd US-China GMS Development Dialogue 2017
Karlsruhe Institute of Technology, Reflex, EU Horizon 2020 Workshop, 2017
Harvard Kennedy School, Lower Mekong Public Policy Initiative, 2017
Academia Sinica, Advanced Institute on Disaster Risk Reduction with Systems Approach for Slow-Onset
Climate Disasters (AI-SOCD) – Air Pollution, Sensors, and Big Data, Taipei, Taiwan, 2017
University of North Carolina at Chapel Hill, Curriculum for Ecology and Environment, 2017
Thammasat University, 2016
University of Tokyo, Policy Alternatives Research Institute, 2015, 2016
MINES ParisTech, Center for Applied Mathematics, 2015
Fulbright University Vietnam, Ho Chi Minh City, 2015
Can Tho University, Vietnam, NSF Meeting on Lower Mekong Energy Issues, 2015
USGS Patuxent Wildlife Research Center, NSF Partnerships in Lower Mekong, 2015
University of Washington, School of Aquatic and Fishery Sciences, NSF Workshop, 2015
SDEWES 2015. Co-Chair Session on Decarbonization. Quantifying Energy Efficiency Opportunities in
Kosovo's Power Sector. Dubrovnik, Croatia, 2015
UN COP21 Paris, December 2015
UN Our Common Future International Scientific Conference, Paris, 2015

Other Experience

USAID Clean Power Asia, Technical Consultant, Technical and Economic Impacts of Distributed PV in Philippines 2018

UTokyo – RAEL Southeast Asia Energy Modeler, Develop Optimization Model in Myanmar and GMS, Work with MOEE and Advise DRD on mini-grid deployment 2016-2018

Thailand Solar PV Roadmap Project, Led and coordinated project funded by British Embassy Bangkok, Worked with GIZ to develop policy documents on solar transition in Thailand 2013-2015

ACS Green Chemistry and Engineering Summer School, 2014, Fellowship Recipient

Biomass Cooking Fuels Project, Carolina Population Center, FUEL Lab, Pam Jagger, PI 2012-2013

Engineers without Borders – Daniel A. Okun Chapter, Solar Mexico, Installed 20 off-grid solar home systems in San Luis Potosi, Mexico 2011

UNC Energy Management, Energy auditing and efficiency intern, Developing Energy Leaders Through Action, 2010

Uganda Forestry Resources and Institutions, Visiting Researcher at Makerere University Faculty of Forestry, Kampala Uganda with Dr. Pamela Jagger and Dr. Abwoli Banana, 2010

UNC Plant Ecology Lab Technician, Carolina Vegetation Survey Research Assistant, 2008-2011

Flathead Lake Biological Station, Summer Research in Field Ecology, University of Montana, 2008