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Comments Draft Funding Initiatives 2018-2020 EPIC - Theme 7

Additional submitted attachment is included below.

Comment submitted by: LBNL, University of Southern California, and Altostratus, Inc.

Title: Comments Draft Funding Initiatives 2018-2020 EPIC - Theme 7

We propose adding an initiative to the triennial plan under Section 7.2 that addresses research to evaluate the urban-heat mitigation potentials of various techniques under present conditions and in a changing climate. This initiative will build upon the EPIC project "Monitoring the Urban Heat Island Effect and the Efficacy of Future Countermeasures" (EPC-14-309) to create region-specific actions. Below we identify topics that could be included in this scope of this initiative.

- Whereas the first UHI monitoring project focused on the Los Angeles region and will generate results specific to a coastal urban-climate archipelago, the proposed research will model and monitor other climate types, such as inland (e.g., Sacramento), San Joaquin Valley (e.g., Fresno), and desert (e.g., Palm Springs). The goal is to evaluate urban heat (and heat islands), how it varies with land use in different climates, and how it relates to physical surface properties at the neighborhood scale, including albedo, soil moisture, vegetation cover, and building geometry. This will help utilities to understand how growth and redevelopment will affect urban climate, and to design future-resilient energy systems.
- Extending the climate / weather modeling and monitoring parameters to evaluate the effects of reduced energy use within cooler neighborhoods on emissions of precursors and on ozone air quality. It will also include assessments of potential future changes in these attributes as land-use and climate evolve over the next decades.
- Carrying out detailed land-use/land-cover analysis, in-depth urban fabric and morphological characterizations, and fine-resolution urban meteorological modeling to determine the technical potential for mitigation of urban heat, and to assess how much of that technical potential could realistically be attained (i.e., how much cooling and mitigation could be achieved at census tract resolution). This may entail the development of a technical–potential index (similar in concept to the Cal/EPA urban heat island index) that can guide communities in selection of heat island countermeasures.
- Translating the research results into metrics not only for energy demand, but also for use by public-health authorities and professionals to assess heat health and air-quality health benefits and implications of urban-cooling measures. For example, heat-island countermeasures such as reflective roofs and shade trees can do more than save energy and reduce peak power demand. By making the built environment inherently cooler, they provide a "Plan B" for safeguarding human health in case of grid failure and loss of air conditioning during a heat wave. This is also important for disadvantaged communities that live in less-efficient building stock and may not have access to air conditioning. Passive cooling may grow increasingly important as climate change raises the frequency of extreme heat events.