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Proposed initiative under sub-theme 7.2 (Haider Taha, Altostratus Inc.)

Please see attached document.

Additional submitted attachment is included below.

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California Energy Commission
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1516 Ninth Street
Sacramento, CA 95814

Subject: EPIC 2018-2020 Triennial Investment Plan

Proposed initiative under sub-Theme 7.2

Proposed initiative title: Development of area- and city-specific targets for urban-heat mitigation under present and future climates

Thank you for the opportunity to provide comments and suggestions on the EPIC 2018-2020 Triennial Investment Plan.

This is to propose that an initiative be added under sub-Theme 7.2 to address research on urban-heat reduction measures by holistically accounting for various interrelated factors and pathways including regional climate, urban micro-meteorology, and energy use. The goal is to carry out observations- and modeling-based research to arrive at a city-specific cooling target (for each major Californian city) at which the energy and climate benefits are maximized.

To respond to a question that is often asked by cities, this research will produce locale-specific actionable results with mitigation measures tailored to the specifics of each area. The city-specific study results, metrics, and technical guidelines produced in this initiative will help cities define their own urban-cooling targets (e.g., expressed as temperature depression or as a cooling index for each area) that would mitigate the local urban heat impacts on energy and environment while maximizing the benefits.

The main research components of the proposed initiative will address the following (not in any particular order):

- Detailed analysis of land-use/land-cover, fine-scale characterizations of urban fabric and morphology, and fine-resolution urban meteorological modeling to determine the feasible site- and city-specific potentials for mitigation of urban heat and develop an assessment

of the technical potential that could realistically be attained in each area, e.g., at the census-tract level.

- Atmospheric modeling to quantify heat transport to each area, e.g., census tract, from upwind sources (non-local contributions) and local heat generation (local processes). This facilitates the determination of how much cooling (urban-heat mitigation) could be realistically achieved at any given census tract considering both the local and non-local contributions to urban heat. This task will build upon concepts applied in the California "Urban Heat Island Index" developed by the Cal/EPA. Similarly, this proposed research could develop a "Mitigation Index" that is area- and city-specific which can provide cities and local governments with quantitative metrics and actionable guidance for implementation of urban-cooling measures as well as estimates of the locale-specific potentials for mitigation of urban heat.
- Analysis of fine-scale urban weather observations (e.g., mesonet networks) as well as fine-scale, urban meteorological modeling of present and future climates (e.g., through 2050) to evaluate how changes in land use/land cover and climate can affect and alter these city-specific thresholds over time. This will also account for the impacts of upwind changes in urbanization, e.g., changes at a neighboring city, over time on the local "Mitigation Index".
- Translation of the results into indexes and metrics that are useful to energy planners, the utilities, and the Energy Commission in quantifying potential energy savings as well as energy planning through the year 2050.

Respectfully submitted,

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