

Title: A Megacity Framework for GHG Measurements

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Session III: New Challenges – Metrology and Standard needs for GHG Emissions from Megacities and Emission Inventories

Abstract:

Nations across the world are evaluating options for achieving energy security and limiting the potentially crippling impacts of climate change. Managing GHG emissions will be central to effective mitigation policies for all nations. Demonstrating the effectiveness of mitigation policies requires the ability to measure progress toward those targets with quantifiable measurements uncertainty smaller than the target values. Urban areas and megacities have localized energy needs and concentrated emissions sources that present challenges that differ somewhat from measurements of the global atmosphere. Thus, collective action and focus on cities has the potential benefit of leveraging resources and maximizing impact on much of a nation's population. Recent studies have shown significant differences among the various methods used to quantify greenhouse gas emissions in cities and urban areas through the NIST urban dome project. This initiative seeks to investigate the sources of these differences to identify approaches that can reduce or eliminate ambiguities and to use this knowledge as the means for developing measurements and standard methodologies of sufficient accuracy to diagnose the most commonly used methods for obtaining greenhouse gas emissions data.

Greater understanding of the underlying mechanisms controlling measurement and estimation approaches has additional potential to reduce uncertainty of emissions data. The levels of accuracy needed for these methodologies should be consistent with reduction targets set by individual nations. As centers of commerce, and communications, cities and urban areas intensify energy utilization and magnify climate variability in relatively small geographical regions. Thus, urban greenhouse gas concentrations will remain a significant issue for the remainder of this century. Emissions quantification, both spatially and temporally, will continue to be a significant technological challenge for these compact geospatial regions for years to come. Measurement issues and needs relevant to megacities will be discussed in the context of an international framework for greenhouse gas measurements and national standards coordination.