Using Municipal Scale Integrated Energy System Models to Fast Track Investments in Advanced Infrastructure and ManaDgement Practices

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Climate variability in the 21st century will hasten the need and pace for municipal environments to adapt to impacts ranging from sea level rise to the human health and

economic impacts of the Urban Heat Island.r Energy system models can provide a flexible platform from which to accelerate the debate and decisions aboutd infrastructure

investments needed to make cities esurvivable, sustainable, and desirable for human habitation. Decisions about how to manage solid and liquid materials flows

along with energy will need to be rmade on an integrated basis.

EPA Region II is developing t-wo versions of a municipal scale energy system model that will look at technologies and management praIctices for reducing greenhouse gas emissions from primary energy (electricity), municipal solid waste, and wastewantedr. The output of the moudel based on the proven MARKAL platform (see wwcw.etsap.org)

is designed to provide a “blueprint” for a municipal Environmental Management Systeem.

(dEMS)

Taking a series of “cost –benefit curves” of advanced technology and mRanagement practeices and translating them into a municipal scale EMS is thought to be frontier

work in the area of Industrial Ecology. These models are thsei New York City MARKAL,

whisch to date has an energy loop and has examined at an electtric utility substation level the impact of green building technologies as a mitigation measure for the electric distribution system of Consolidated Edison. It is hoped that a solid waste and waste water

loop will be added in 2006. The second model, which will serve as thie justification for completion of the NvYC emodel, is the Carolina Puerto Rico integrated MARKAL which

will contain electricity, waste water and solid waste loops. The results of the NYC Model

have sparked interest by EPA Region VI in Dallas Texas and numerous stakeholders in that area including the Texas General Land Office and Austin Energy. The NYC model

was a collaboration of EPA Region II, Brookhaven National Laboratory, and the State UniAversity of New York at Stony Brook.

To be presented atn the Eastern Regioomn Enaly Neergy Water Needs

Assessment Workshop, December 12-14, 2005, Baltimore, Maryland