



Local governments working together for a better metropolitan region

February 15, 2009

Memorandum

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Takoma Park

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Manassas

Manassas Park

Prince William County

**Adjunct member*

TO: Climate Change Steering Committee

FROM: George L. Nichols
Department of Environmental Programs

SUBJECT: Street Lights Demonstration Program

Purpose and Background

The purpose of this memorandum is to provide an update on the regional street lights demonstration initiative. The Climate Change Steering Committee's report to the COG Board identifies a range of regional greenhouse gas reduction strategies. Among the implementation strategies is a recommendation to "*examine options and develop plans for replacing street lights with energy efficient street lighting (LED or other options) across the region.*"

Rationale for Street Lights Recommendation

A report commissioned by the Ford Foundation and written by Bob Grow of the Greater Washington Board of Trade examined the potential of energy efficient streetlights for reducing Greater Washington carbon footprint. The report estimates that there are about 300,000 street lights in the Greater Washington region. It also estimates that this total consumes 200 million KWh of electricity resulting in an expenditure of \$12 million annually.¹ The Climate Change Steering Committee believes that street lights offer a tremendous opportunity to conserve energy while reducing greenhouse gas emissions. In fact, the report estimates that total electric use can be reduced by 100 million KWh annually, saving \$6 million and reducing CO2 emission by approximately 78,000 metric tons of CO2.²

In addition to the Climate Change Steering Committee action, the Clinton Climate Initiative (CCI) has significantly raised awareness of the potential energy savings from street lights. The CCI promotes street lights technology as a best practice. Below are several examples.³

- In 2007, Ann Arbor, Michigan installed 1,400 56W light emitting diode (LED) streetlights to replace 100W (high pressure sodium (HPS) street lights; energy saving of >50%; payback in 4.4 years.
- In 2008, Anchorage, Alaska tested 85W and 165W induction street lights, as well as 81W and 108W LED streetlight, to replace 250HPS street lights; energy savings form 40-60; City expects to replace all 16,000 of its lights with these two technologies; payback expected in under 7 years.

¹ Energy Efficient Streetlights, Bob Grow, p.12, March 2008.

² Ibid. p 13.

³Clinton Climate Initiative, *Outdoor Lighting Program, June 2008*

- In 2007, Oslo, Norway began to equip its 55,000 HPS streetlight with an intelligent control system and electronic ballasts. This action has resulted in a 70% reduction in energy consumption and a cut in CO2 emissions by 1440 tons per year.

These are just a few examples of the best practices models that apply different technology for upgrading street lighting systems.

Street Lights and Technology

A street lights program integrates new technology by replacing old technology with new energy efficient technology in the application of updating a street lights system. Mercury vapor, although common, is one of the older technologies. LED offers a greater value. Table 1 identifies selected technology options.

Anticipated Action and Roles

The CCI has expressed interest in implementing a visible street lights project demonstration in the Metropolitan Washington region. Hannon Armstrong, a finance partner of the Clinton Climate Initiative, has also expressed an interest in financing a demonstration in the region. As you know, Hannon Armstrong is a partner in the "Energy Efficiency Partnership of Greater Washington," a landmark initiative to tackle the problem of global warming by retrofitting existing buildings with energy efficiency products designed to decrease energy use and significantly cut carbon emissions. This Partnership has committed \$500 million to this initiative during the first five year to retrofit buildings in the Greater Washington region.

Progress to Date

1. Working Group Formed: A *Street Lights Working Group* consisting of staff from the Greater Washington Board of Trade (BOT), COG, Hannon Armstrong, and CCI has been formed to explore our mutual interests in a street lights demonstration in the Metropolitan Washington area.
2. Survey Questionnaire Completed: COG surveyed its members to determine which local governments are owners of some or their entire street lights on public property. The survey questionnaire was designed to obtain background data on the parameters of the existing street lights system, including system equipment base, system ownership, system design, retrofit procurement and replacement schedule. A synopsis of the preliminary findings is attached.
3. Identification of Demonstration Pilots: Staff is currently in the process of identifying pilot projects to retrofit energy efficient lighting, possibly in the District of Columbia and or perhaps other smaller projects, demonstrating the various technologies. In addition, COG has initiated a dialogue to partner with Dominion Power who recently announced an LED pilot demonstration. Dominion is soliciting a limited number of partners for test installation of LED outdoor lightening equipment. Likewise, partnership opportunities are being explored with Pepco Holdings, Inc. The goal would be to establish a database that demonstrates practical applications, and ultimately cost savings and greenhouse gas reductions.

Next Steps

Over the next weeks, a meeting of the Street Lights Working Group will be scheduled for late February. A detailed action plan will be developed that complements the Climate Change work program. The focus will be on: documenting best practices; hosting a street lights workshop; developing partnership opportunities with local utilities; selecting pilot demonstrations; and facilitating financing resources for

project implementation.

I will keep you apprised of this initiative as it moves forward. Meanwhile, if you have any questions, please give me a call at 202-962-3355 or email me at gnichols@mwkog.org.

Table 1
Selected Street Light Technology Options

Technology	Description
<i>High pressures sodium vapor (HPS)</i>	The sodium vapor street light has become the dominant type on American roadways and most people have become accustomed to the orange/yellow glow. It is by far the most efficient light source when compared to Mercury Vapor (MV) and Metal Halide (MH). Color Corrected Sodium Vapor Lights exist but are expensive.
<i>Induction</i>	A newer type of light source that features extremely long lamp life (100,000 hours), energy efficiency, high color rendering index, and a color temperature close to incandescent lights. Induction lamps have a higher up front cost than other types, but because of the long lamp life, these lights are more and more appealing due to their low total cost of ownership. Some jurisdictions that use induction fixtures for street lighting include Frederick, Maryland; Kensington, Maryland; Garrett Park, Maryland and Chevy Chase View, Maryland.
<i>Ceramic metal halide (MH)</i>	Metal halide lamp streetlights have illuminated the roadways and parking lots. Metal halide has long been popular in business installations and can be found in warehouses, schools, hospitals and office buildings. Unlike the old mercury lights, metal halide casts a true white light. It is not nearly as popular as its sodium or mercury counterparts, as it is newer and less efficient than sodium.
LED	Light Emitting Diodes have virtually replaced both incandescent lamps and the occasional fluorescent lamp in traffic signal and crossing sign usage. They are rapidly developing in light output, color rendering, efficiency, and reliability. The cost of LED lighting is still extremely high compared to an incandescent lamp used for the same purpose, but the cost is decreasing rapidly. Even with the high per-unit cost, the increase in efficiency and increased lifespan make them very attractive for street lighting use; the reduced cost of electricity and maintenance in many cases can offset the increased cost of the lamp.