Street Lights – A New Metering Frontier

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Emerging Technologies Session
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Introduction

This presentation will discuss the current usages and challenges for streetlight metering and the latest in testing/qualification of streetlight meters.

Streetlight Metering—Why change?

LED's

LED's have swept through one industry after another over the past twenty five years. Once LED's are developed for a particular application they take over that industry in just a few years

LED's start to take over

A Better Solution

- Better lighting of the pavement surface
- Light is better directed so there is less light pollution
- Less maintenance
- Longer Life
- Less energy consumed
- Ability to control the lighting load by individual light or bank for
  - more suitable use given the location and time of day
  - emergency situations

Streetlight Metering—Intelligent Lighting

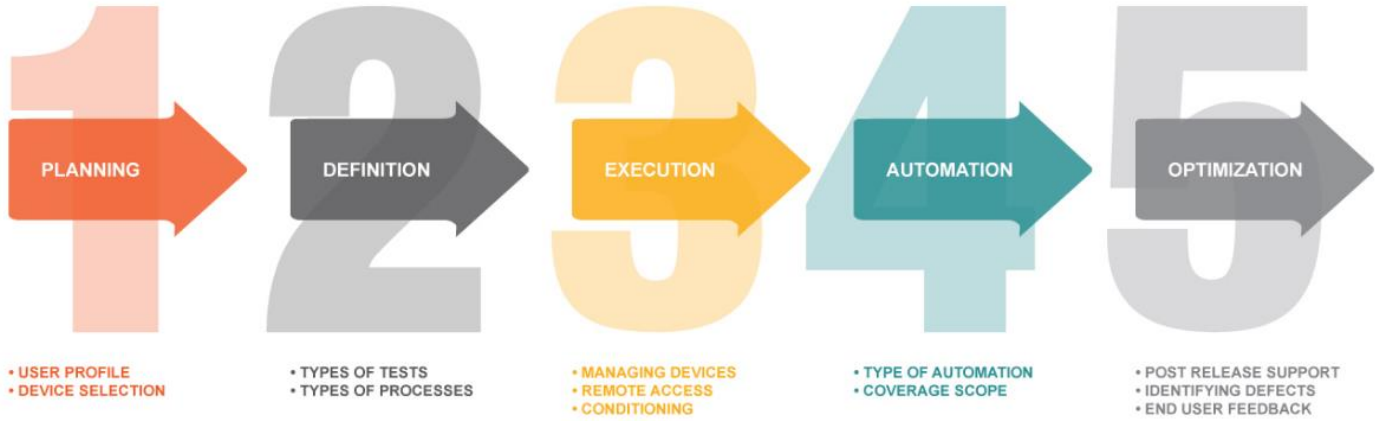
Streetlight controls:

- Standard photocell operation
- Advanced controls for holiday lighting, billboards, etc.
- Remote mesh network communications
- Scheduling and dimming (LED Lighting)

Graphic: GE lighting

Streetlight Metering—Intelligent Lighting

Integration of metrology into streetlighting…



Graphic: 360Logica.com

Streetlight Metering—Intelligent Lighting

Integration of metrology into streetlighting

- Metrology (metering function) integration into “nodes”
- Combining metrology with remote access gives utilities access to information that they may never have had before.
  - Read voltage, current and power factor from each node.
  - Determine changes in lighting element faults and poor operation.
  - This information can be used to determine lighting outages (and dispatch a service truck automatically).
  - Can be used to monitor general outages like residential meters are now.

Streetlight Metering—Intelligent Lighting

Energy metering today:

- .5%, 1%, and 2% metering capabilities are now being quoted
- Qualification and validation documentation very sparse.
- No complete ANSI regulation to guide qualification testing, though a committee has formed and a spec is being developed (C136.50)

Streetlight Metering—Intelligent Lighting

Energy metering today:

- Without the type of qualification testing that metering groups are used to doing prior to rollout of new vendor equipment or technology, billing usage for these nodes has been rare.

Streetlight Metering—Intelligent Lighting

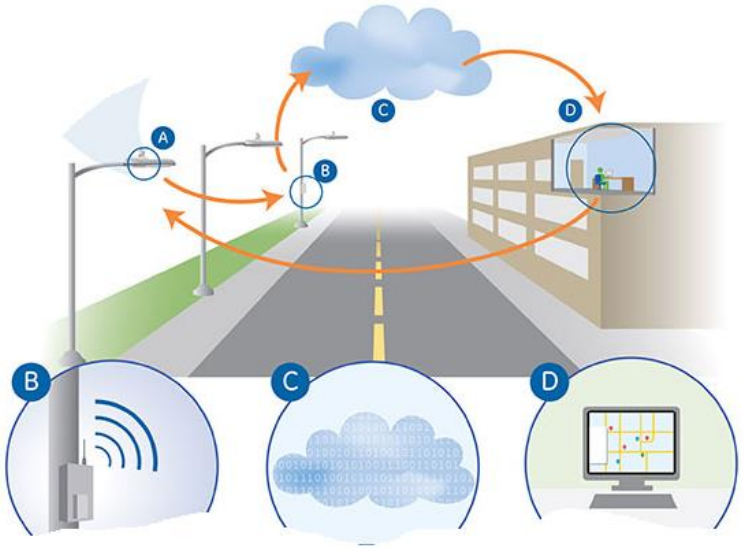
Using metrology to do energy metering

- A utility may want to test the accuracy of the nodes and work with local municipalities to determine whether the variance in billing due to metering accuracy could still provide better consistency and more accurate billing than current fixed billing algorithms can provide.

Streetlight Metering—Applications

Applications

- Single streetlight meter
- Group of single streetlight meters
- Meter for a group of streetlights
- Meter for any pole mounted device



Streetlight Metering—Challenges

Testing Challenges

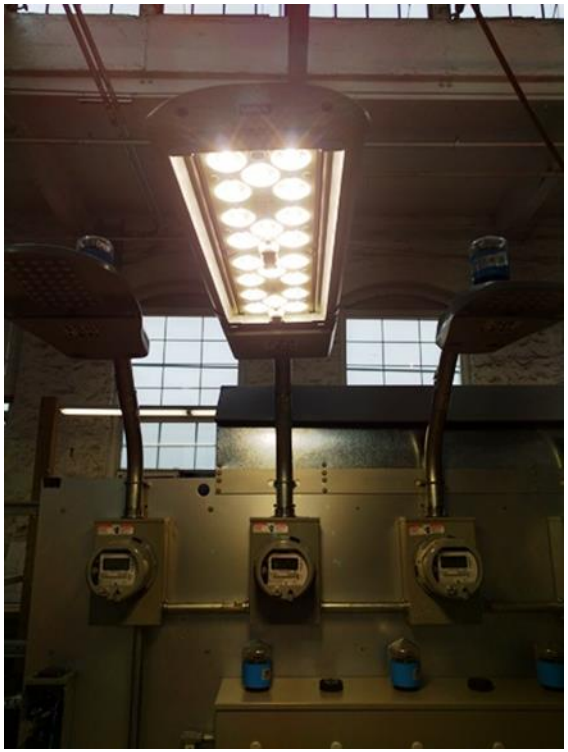
- Meter test pulse

  Without this pulse, most nodes only report whole watthours through their communications radios. Testing requires 10,000 Wh (in order to get 5 significant digits – 100.00%). 10,000 Wh at 120V and .25A (typical Light Load value) would take 320 hours

Streetlight Metering—Challenges

Testing Challenges

- Meter setups
  - The setup on each node must be checked to make sure that it is not setup to do any scheduled dimming, or scheduled on/off control, so that the output relay remains on during the testing.
  - After testing is complete, the setups should be returned to the factory settings before releasing the node.



Streetlight Metering—Challenges

Testing Challenges

- Functional / Communication testing
  - This testing is going to be quite similar to standard revenue meters, as the communications networks used are either the same, or similar to what you are used to.
  - One difference would be that if the utility is using scheduled on/off/dimming, that program will have to be setup or downloaded to the node before releasing for installation.

Streetlight Metering—Challenges

Testing Challenges

- Conclusions
  - Testing of streetlight meter nodes will become far easier and less time consuming when they all include IR meter test pulses.
  - The testing will all be more equitable for all manufacturers and users once the ANSI specification is released.
  - Relevant testing both for accuracy and functionality can still be done in light of the above; it will just take longer and could be somewhat subjective

Streetlight Metering—Devices Needed and Testing Required

Products:

- Test Boards
- Mounting sockets
- Transformer Rated applications
- Field Test Equipment
- Meter Farms
- Meter Socket Adapters

Tests:

- Manufacturer product evaluation testing
- Accuracy testing
- Functional testing
- Qualification testing

Negative Business Case

A large investment by Electric Utilities for less revenue

- When the market place wants something there is no wisdom in trying to hold back the flood gates. Embrace and figure out how to not only survive but to thrive.
- Smart Poles
- Additional Lighting
- Controls for the Lighting
- Potential new products for Industrial Customers
- Potential new products for residential customers

Questions?

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This presentation can also be found under Meter Conferences and Schools on the TESCO web site:
www.tescometering.com