



THE EASTERN SPECIALTY COMPANY

# Streetlight Metering



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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)



**Control Metering**  
with per-pole utility-grade metering,  
so you only pay for what you use, to  
help you save money.



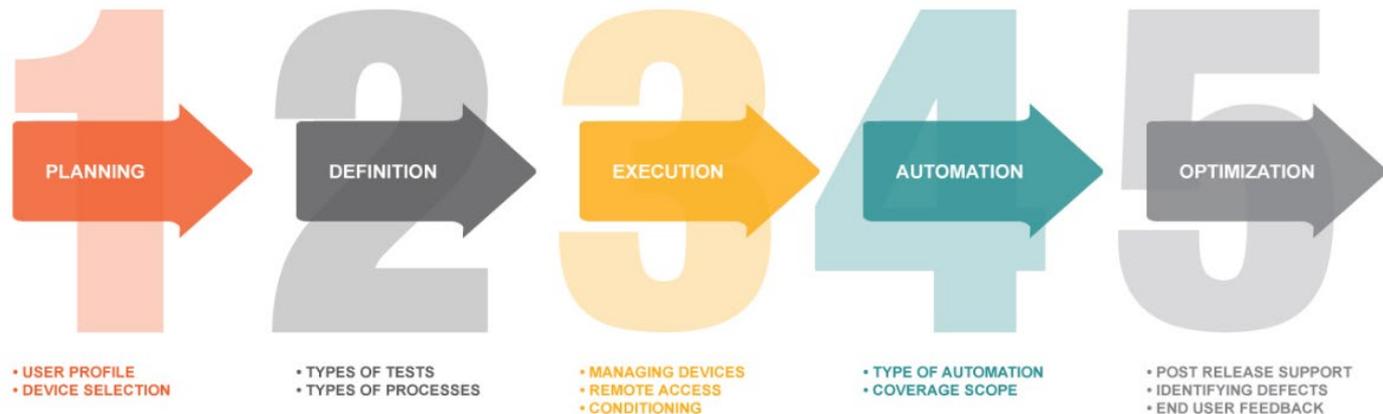
**Control Maintenance**  
with quicker, more efficient upkeep.  
Experience better maintenance  
scheduling and response to outages,  
to help you save manpower.



**Control Output**  
with more precise dimming schedules,  
notably for middle-of-the-night operation  
in low-traffic areas, to save energy 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

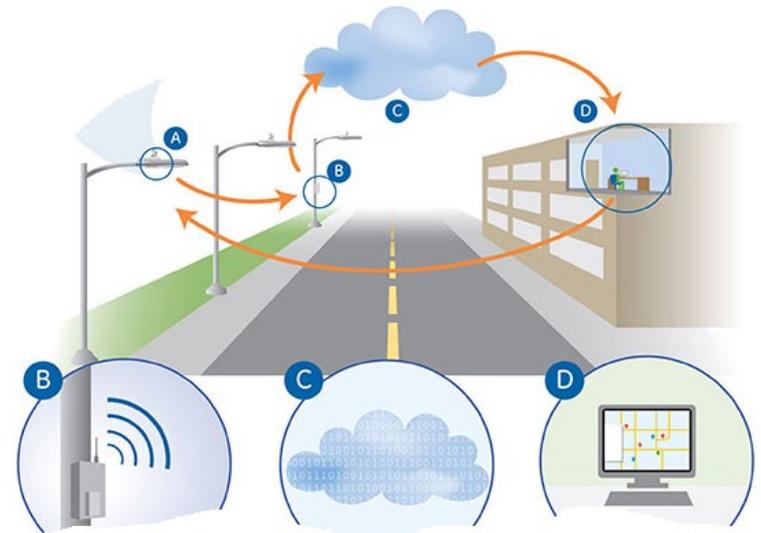
- A utility may want to test the accuracy of the nodes and work with local municipalities to determine whether the variance in billing due to metering accuracy could still provide better consistency and more accurate billing than current fixed billing algorithms can provide.



# 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 watt-hours 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

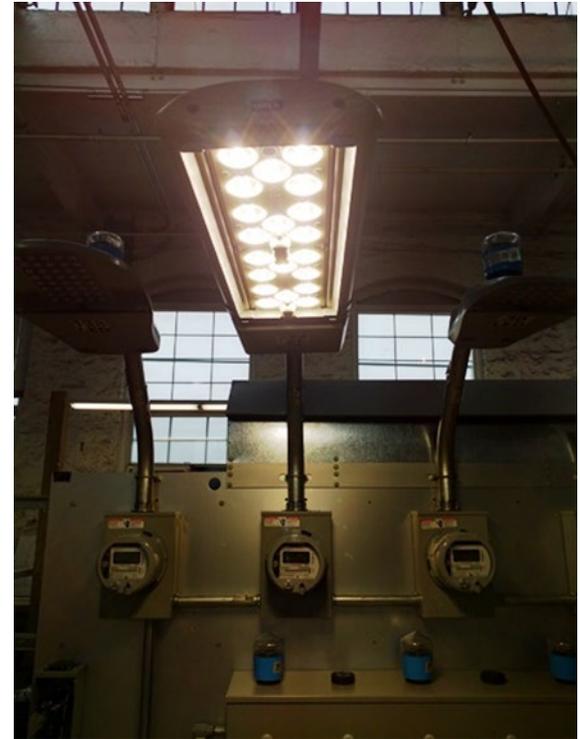
- C136.50 is now requiring a pulse for every street light “meter”. Testing can now be done in “conventional” time periods.



# 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.
- Working to introduce to C136.50 the concept of test modes for street light meters.



# 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
  - A Test Mode will make testing of streetlight meters easier and more consistent to perform in a meter shop environment.
  - 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—Tests Required

## Tests:

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



# Streetlight Metering in the Meter Shop

## Equipment Needed:

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



# Negative Business Case or Business Opportunity?

## 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

**.....but also an investment in future Business Opportunities**

# Questions and Discussion



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