



Increasing Grid Efficiency by Putting a Clamp on Power Loss

Portable Check Monitors

Locate Bypass theft

Phase Balancing

Load Profiles



Presentation Agenda



- About Tecovation
- About Awesense
- SenseNET solution a Game Changer
- SenseNET:

Tackle theft: Market, ROI, How it works, Differences Balancing phases Match equipment to loads Inspect C & I meters Increases inspection staff safety

Conclusion



Bothongo Group & Tecovation

Bothongo is a R3 Billion Commercial Real Estate Company Founded by Keith Bothongo in 1997



Tecovation is an IT startup that is majority owned by the Bothongo Group

Our goal is to work with customers, suppliers, and Municipalities to provide sustainable business solutions

Tecovation is currently in the process of being certified as a level 3 BBBEE compliant company

Tecovation is Technology for Business Innovation



About Awesense

Awesense solutions are in use today helping utilities recover millions of dollars every year and growing.

Awesense Wireless is based in Vancouver Canada and currently employs a team of people for design, manufacture, sale and support of its patented amperage monitor and related software.



BCBUSINESS Top 20 Most Innovative Companies in B.C.

Awards



BC Hydro innovation in Sustainability winner

2013 Municipal Smart Grid Summit – winner "Vendor to Watch" Growing number of "technology to watch" awards and nominations

- Rural Smart Grid Summit
- Greentech Media

Portable Check Monitors

Locate Bypass theft

Find Meter Malfunctions



Utility Provider Goals



- Financial & Operational: increase grid efficiency, shrink power loss, operate more reliably
 - A mWh saved from stopping technical losses is equal to a mWh saved by stopping commercial losses
- Investment goal: aim for lowest cost per mWh while improving grid reliability
- Increase worker safety
- Empower employees



SenseNET



- Recover and stop more theft:
 - Find Sophisticated bypass/diversion
 - Faster and safer for workers
- Find C & I meter issues
- Increase reliability and determine optimal grid investment strategies with Phase Balance and Load Profile reports



Theft: tampering is the tip of the Iceberg

(As quoted by Dr Michelle Gratz)



- Sophisticated diversion is invisible
- Theft is a moving target
- Find it when you use a portable tool like Awesense

Types of Power Theft – Awesense finds it all





Mechanical Meter Tampering

The meter is turned upside down in the socket. A magnet or a hole is drilled to mechanically disrupt the meter reading.

Smart Meter Tampering or Switching

The meter is opened and electronic parts removed or replaced to provide lower readings. The meter is simply switched with a meter from a nearby premises that uses little or no electricity.

Bypass of the Meter inside the meter enclosure

Connections are made behind the meter to bypass the meter. Sometimes visible but often placed behind the meter.

Tap-in diversion before the meter on secondary lines

A tap on the service line before the meter, often underground or behind walls. Utilities estimate that bypass ahead of the meter accounts for the majority of energy thefts.

Transformer placed on primary lines

A transformer is installed to look like it was placed by the utility. This sophisticated bypass is used when very large amounts of current is

> required. (Another level of sophistication: pressure pad shutoff around padmount transformer)

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Load Monitoring



Portable Check Monitors







Mid-Carolina EC, SC



- Approximately 50,000 meters
- 3.6% Total Power Loss in 2011.
- Believed they had no theft to speak of

That belief changed when police exposed a chain of 12 marijuana grow-ops in their territory. Estimate \$500,000 stolen over 2 years.





Find High Value Theft



• Marijuana grow-op (\$20 000 per year average Largest \$500 000 per year)



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The Awesense Solution Componen

- SenseNET portable transformer monitors
- SenseNET Field Application and Wireless Receiver
- SenseNET CORE





awesense





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The SenseNET system supports each stage of investigations:



Putting a Clamp on Power Loss

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Tactic: investigate an area: energy Balance to find power losses



Does Δ**Raptors**=∑**Meters** +∑**unMetered**?

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Application: Power Loss







Application: Power Loss







Application: Power Loss





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Portable Check Monitors

Application: Power Loss



Load Monitoring



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Deploy Monitors





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Quick Specs







- Overhead & Underground
- Data logging stored on device
- 5 Second increments
- Primary & Secondary
- One inch conductor (opt to1¼)
- Up to 35 kV
- From 0.1A to 400A
- 0.01 A increments
- Accuracy of (+/-) 1%
- Wireless communications
- Range up to 1000 Meters



Portable Check Monitors

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and SenseNET Field Application





- Self creating RF mesh network
- Connect to one = connected to all
- Wireless range of 1000 meters between devices
- Raptor, network and battery information
- Upload Deployment to CORE









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SenseNET CORE, web-based service

- Modify, Record, Archive
- Sync
- Rank
- Reports

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AWESENSE

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C & I Meter Verification



Find and Reduce Losses from:

- Improper Installs
- Incorrect multipliers
- Equipment malfunctions



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Phase Balancing and Profiles



- While finding theft SenseNET gathers data at many points in the system
 - More granular detail than ever achieved before
 - Portable, fast, accurate
- Capture data to address reliability issues and prioritize capital investments

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Portable Check Monitors

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Game-Changing



Completely Mobile & Wireless

No Service Disruption

Flexible easy to use Applications

Automated Reporting and Analytics & no IT

Complete Solution – Not Just Hardware

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Empowering You with Technology for Business Innovation

Thank you

www.tecovation.com