ENERGY CENTER
OF WISCONSIN

Industrial Energy Efficiency: sub-metering

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Technical Working Group: Industrial Efficiency
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Arguments supporting sub-metering

Vestal Tutterow, Project Performance Corporation
Steven Schultz, 3M Corporation
Jeffrey Yigdall, PPG Industries
2011 ACEEE summer study on industrial efficiency

Making the Case for Energy Metering and Monitoring at Industrial Facilities

Sub-metering case study

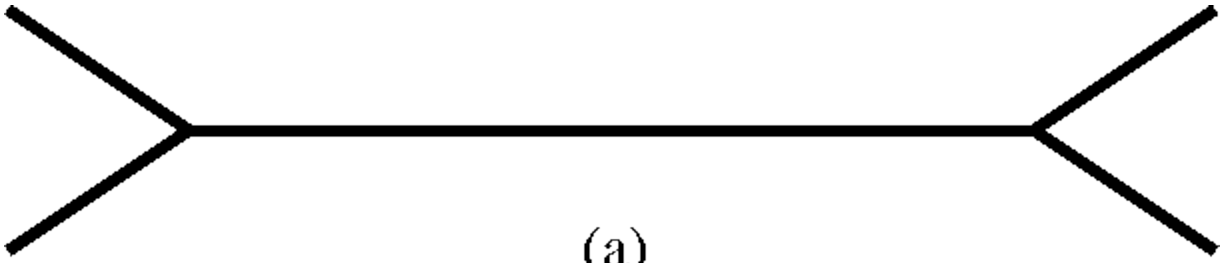
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

INDUSTRIAL TECHNOLOGIES PROGRAM

Nissan North America: How Sub-Metering Changed the Way a Plant Does Business

Arguments supporting sub-metering

you can’t manage what
you can’t measure



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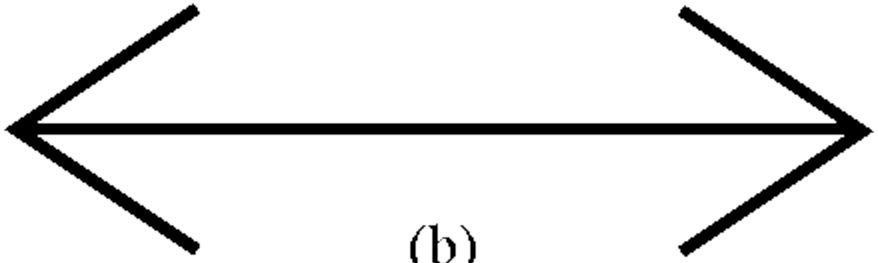

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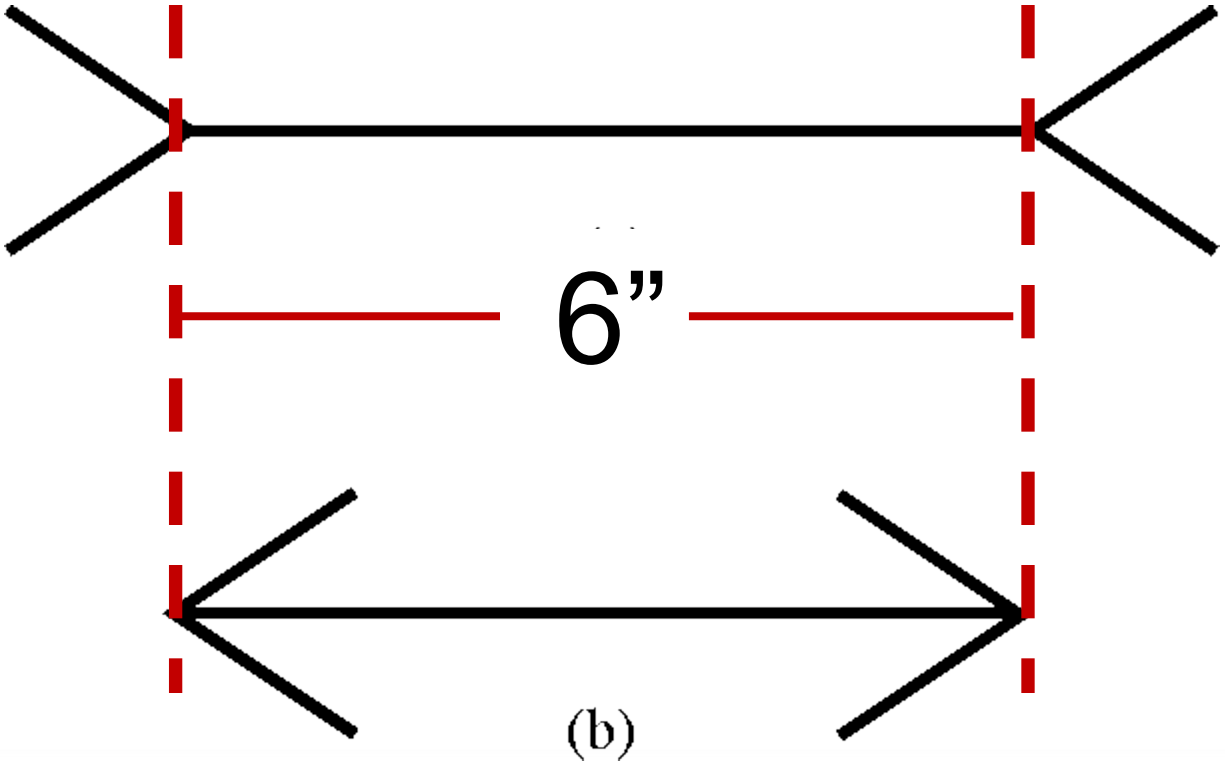
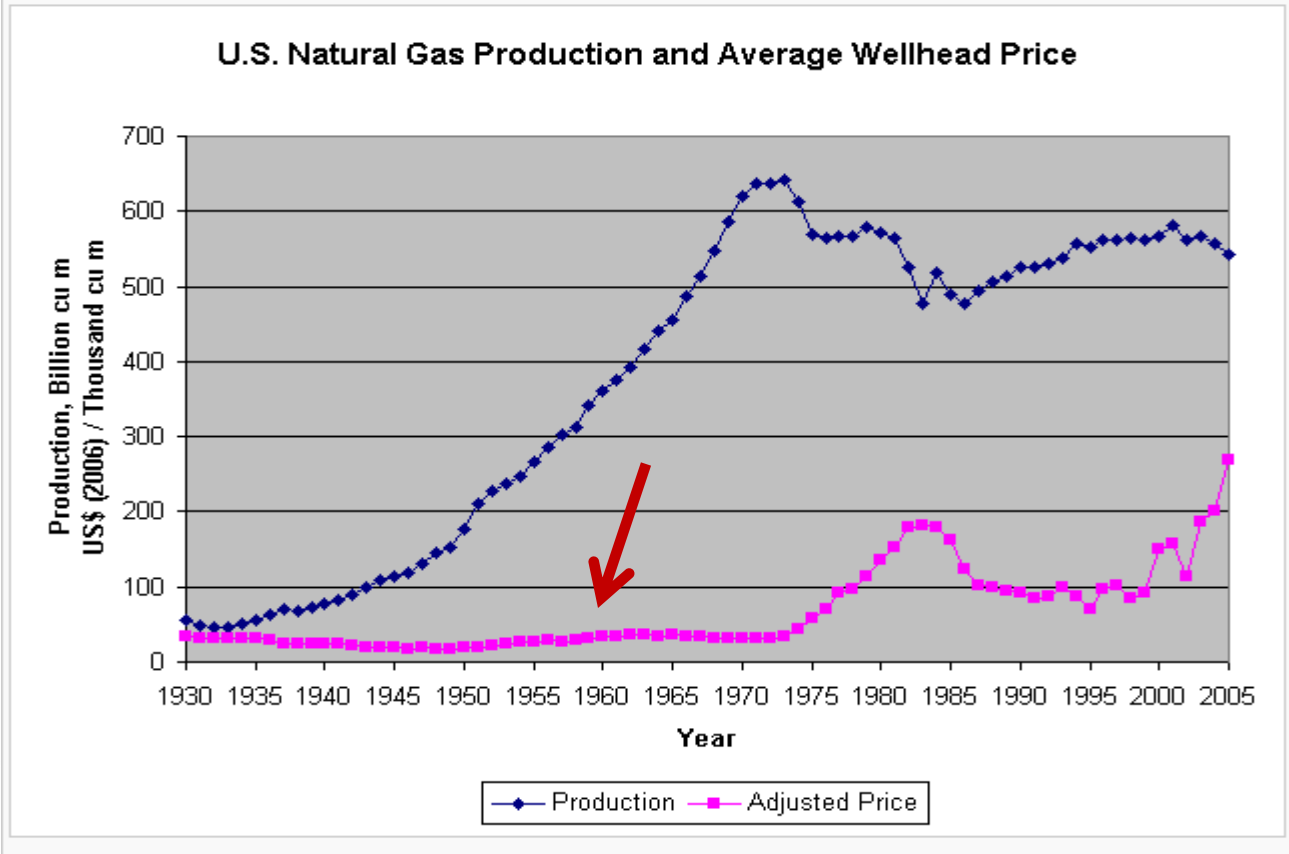


U.S. energy history

- Engineers designed older plants assuming that energy costs were essentially fixed.



Duration of measurement

- Spot
- Run-time
- Short-term
- Long-term

Scale of measurement (all energy, water, compressed air)

- Site
- Plant
- Department
- Process

Ease of analysis

information is of no value unless it can be communicated, either to a local PC, an energy management or building automation software system, or a web-based service that can provide analysis of the data

Barriers

ROI

resistance

risk

Overcoming barriers

internal champion

Overcoming barriers

internal education

Overcoming barriers

CDP™ ACCREDITED PROVIDER 2013

social pressure (including from investors)

Energy savings?

Yes, but…

Metering and monitoring devices do not reduce energy consumption or demand. They simply record and transmit data for analysis.

Role for utilities

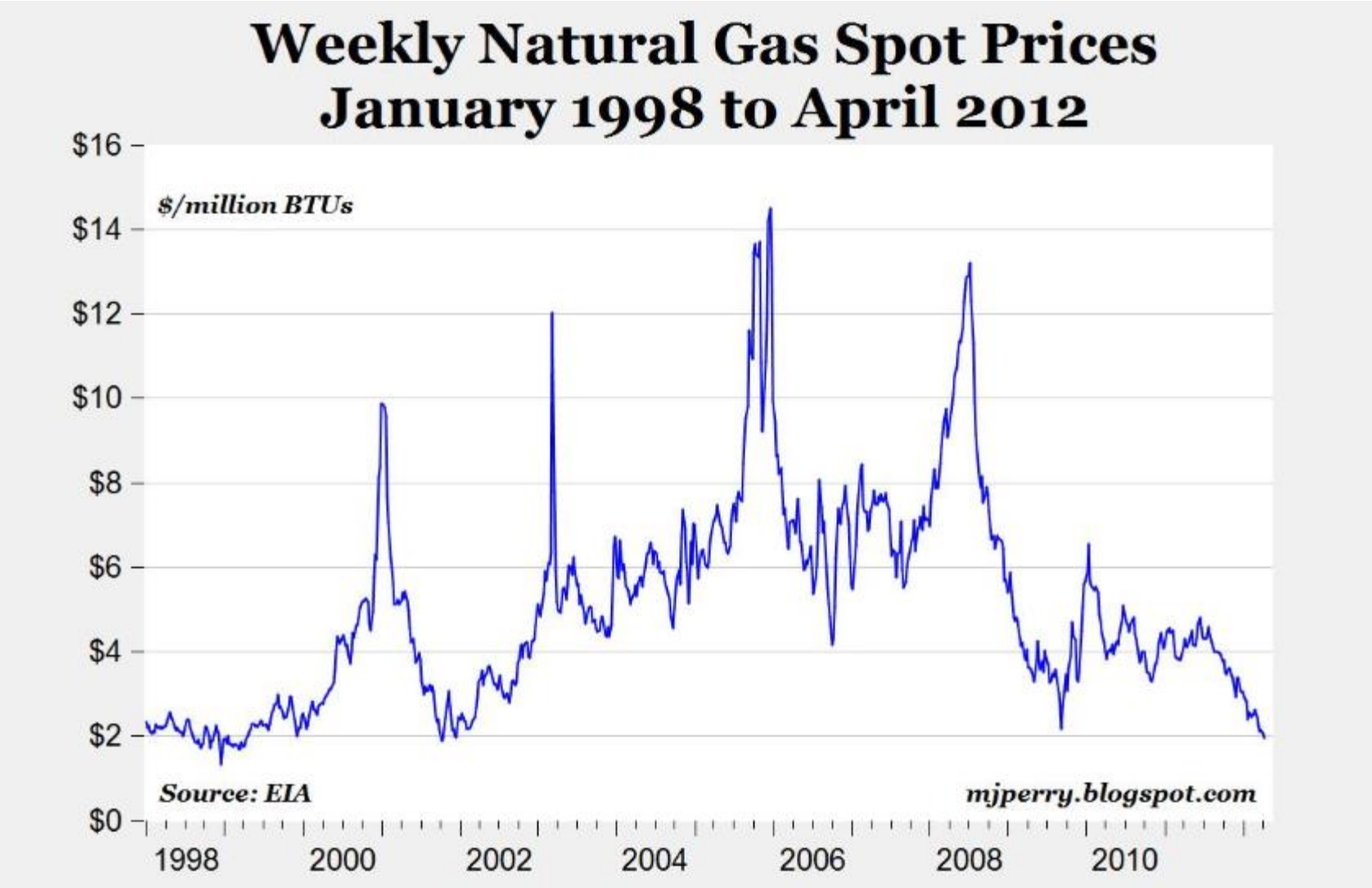
An important step would be for utility companies to provide incentives, such as rebates, to encourage the installation of metering and monitoring devices.

Role for government involvment

Incentives at the state level may also be of value, but utility companies, both electric and gas, already have established relationships with most industrial facilities and therefore can have a broader and more immediate impact.

Nissan Plant, Smyrna, Tennessee

Why manage energy use?



Employee reaction

resistance due to complexity and ingrained culture

Employee reaction

- “We don’t run the plant that way.”
- “You’ll ruin the equipment.”
- “We’re already as efficient as we can be.”

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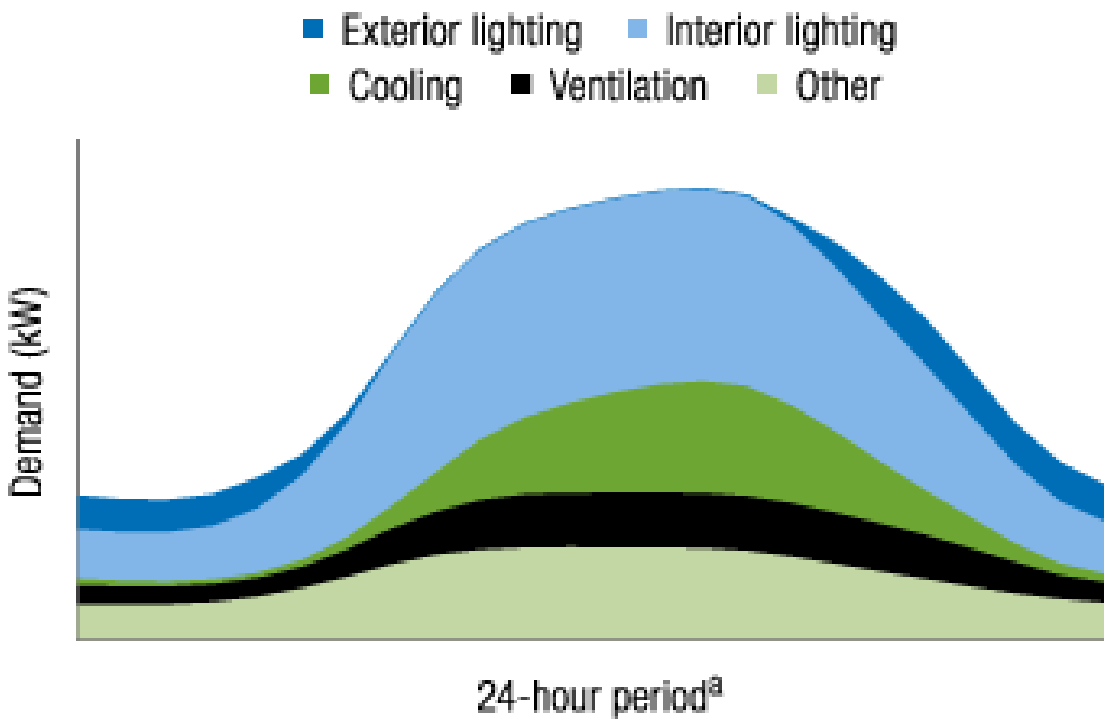
Once in place

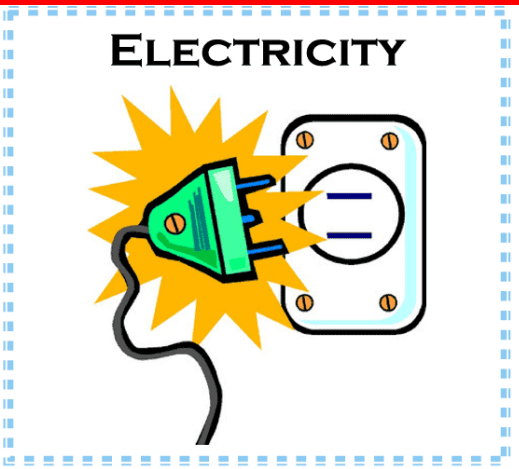
value recognized once data started flowing



Notes: kW = kilowatt.
a. 24-hour period = midnight to midnight.

© E Source; data from ITRON

Measurement



Measurement

every

Measurement

- Analyzing data
  - Plant staff—several times per **day**
  - Plant manager—**weekly** and **monthly** reports

Measurement

- Analyzing data
  - Plant staff—several times per day
  - Plant manager—weekly and monthly reports
  - **Vice-President of the Americas—weekly** and **monthly** reports

Energy team leader for Smyrna plant

?

Energy team leader for Smyrna plant

- Vice-President of the Americas

commitment
at the top

Visual reporting

Plant Electricity Use Scorecard

	Weekend Use
Stamping	●
Body	X
Paint 1	●
Paint 2	◉
Paint 3	◉
Trim	▲

Previous Week (Ending 11/7)

	Weekend Use
Stamping	▲
Body	●
Paint 1	X
Paint 2	●
Paint 3	●
Trim	X

Current Week (Ending 11/14)

Where:

◉ = Best (< 5% Base Use)
● = within 5% Base Use
▲ = between 5% - 8% Base Use
X = > 8% Base Use

Lessons learned

letting data drive decision-making…

Lessons learned

…empowered and energized plant staff…

Lessons learned

…helped senior leadership understand the bottom-line impact of proposed projects…

Lessons learned

*…and **produced meaningful energy savings**.*

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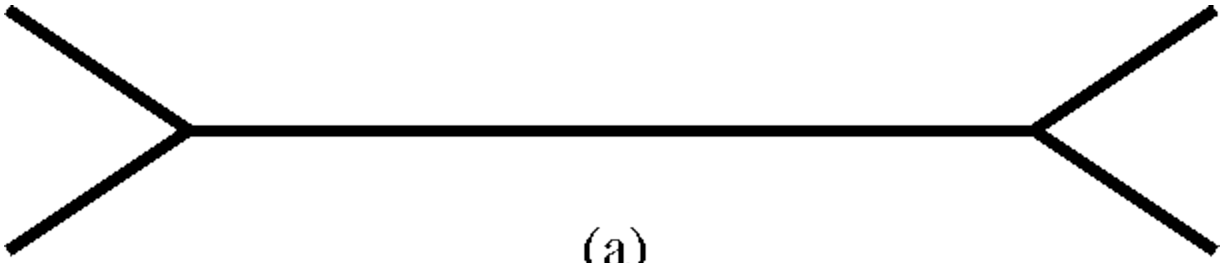

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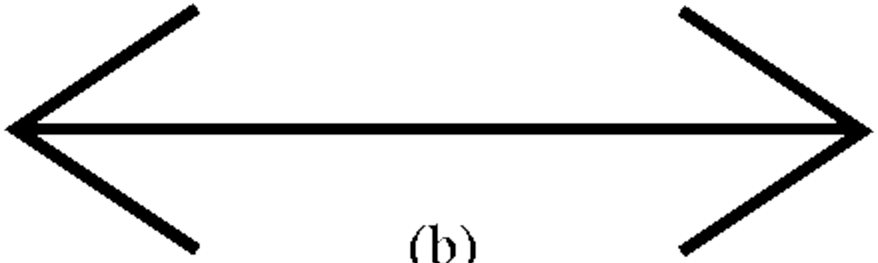

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