


Good Audits Versus Paperweights

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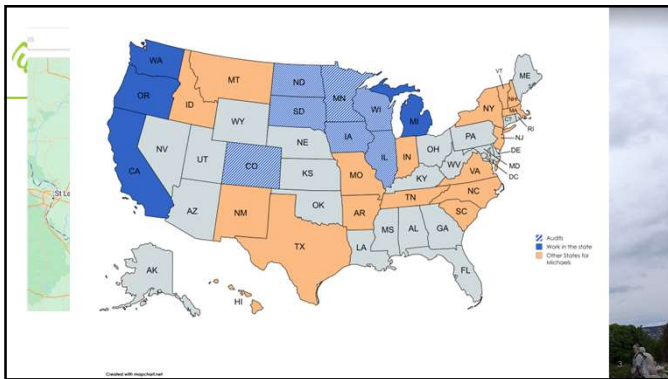


(Objectives) What are you listening for?


- What makes an audit "used"?
- How to adjust an audit to accommodate the customer
- Which measures are "good" measures
- Basics to include regardless
- Quality over quantity
- Service/reminders

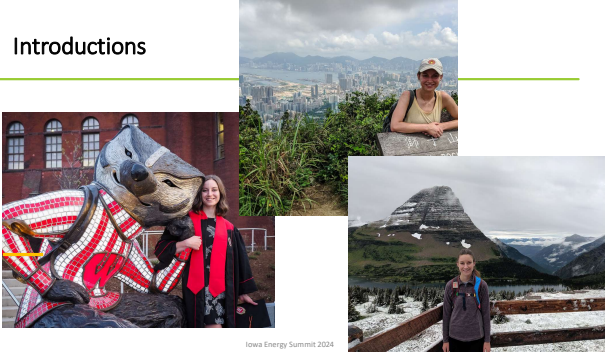
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 **Introductions**








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 **Basic Level II Points(s)
ASHRAE Standard 211**

- Scope (know your time limits)
 - Envelope
 - Lighting
 - HVAC
 - Building Automation System
 - Centralized HVAC/process (Boilers/chillers)
 - Steam Systems
 - Refrigeration
 - Onsite power
 - Data centers
 - Conveyance
 - Plug loads
 - Laundry
 - Food Prep
 - Irrigation


-  Cost analysis
-  Benchmarking
-  Energy intensity
-  Risk assessment
-  Present results

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 **Other Basics for Level II**

- Usage breakdown
- Energy costs for fuels (water?)
- 12-month energy usage all fuels
 - (kWh/kW/Natural Gas/Water/other fuels?)



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Not Level I or III

Level 0?

- Baseline energy usage

Level I

- Idea and suggestive report
 - Cost – minimal/some/a lot
 - Saving – low/average/high
- Concentrate on this

Level III

- Limited Scope.
 - Typically only one system/piece of equipment.
- Investment level report
 - More accurate numbers
 - Metering/vendors/

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Customer interaction

- Whatever = hard sell
 - Ask what they want from it since you're there anyway.
- Interest = more measures
 - You're there for 4-8 hours. They've been there for years.
- More people = more buy in = more project ideas
 - Too many people?
- Do they take care of equipment?
 - Look pretty?

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Who wants what

- Ostentatious CO2 Goals
- Energy impacts/goals
- Energy intensity
- How they compare to peers
- Easy measures (everyone wants this)
- To be told they are efficient
- Why are my bills so high?
- How does my electric rate work?



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What makes a good Audit?

Good Audit

- That it's used
- Implement measure
- Also, that it's used
- Understand problems/issues der
- Did I mention that it used?



Bad Audit

There are some things you already know. Good luck." Experimental/confusing measures
 "fit measures
 "lap a VFD on it"

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The unusual

- Envelope – A little pricey but that shouldn't exclude it
- Shades – you got 'em use 'em
- Why is that plugged in?
- What is the next greatest thing?
 - Should I get one?
 - Does it even apply?



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Process measure – the unknown

- Process equipment is typically a unicorn
 - Target inputs not machine itself; easier to implement
 - Ask about bottlenecks



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Onsite

- Review building plans
- Any previous reports
- O&M reports/interviews
- Space types and breakdowns
- Identify low-cost/no-cost measures
- Get to know the customer
 - Headaches
 - Pain points
 - What's coming down the pipe?
 - How well is equipment maintained?

- Measures based on: (judgement)
 - Description
 - Modifying existing system
 - Impact on occupant comfort
 - Non-energy impacts (water/maintenance)
 - Energy and cost savings
 - ROI
 - Priority

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Include

- Energy breakdown up to around 80% of the energy usage (goal)
- Operational set points (mostly HVAC based)
- Operating schedules
 - Equipment mostly
- Equipment efficiencies sure – controls mostly
 - HVAC mostly

- Qualitative Assessment of:
 - Duct and/or piping insulation leakage
 - Duct and/or piping insulation losses
 - Steam trap losses
 - Over conditioning losses
 - Energy recovery
 - Transformer efficiency
- End use categories
- End use systems
- Renewables?
 - Figure out impacts

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If they should do it, tell them straight out

- Action (do it !!!)
 - Change
 - Adjust
 - Tune
 - Clean
 - Replace
- Probably do it?!?!?!
 - Consider
 - Investigate
 - Study

[Analyzing 12,000 Commercial SEM Measures \(aceee.org\)](https://www.aceee.org/analyzing-12000-commercial-sem-measures)

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“Easy Measure” The golden goose

- How much do they know?
- If good but not 1-year simple payback, will they act?
 - Grants?
 - Additional support?
- If it's a lot of savings, can you find a way?
 - Energy is an expense.

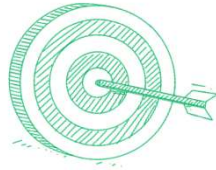


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Shotgun approach

- Quantity over quality
 - Details
 - Customer interaction

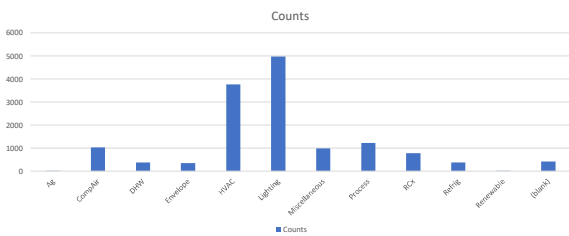


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The most common



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What to include - extras

- Problem pictures
 - Seeing the problem shows them right where to go.
 - "Adjust the timer." Which timer?
- More things = more time
 - Like all things, new ideas come with curve balls.



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Be flexible

- ENERGY STAR certifications
- Indoor air quality (IAQ) assessments
- Electrification/carbon offset opportunities
- Water/other fuel savings
- Sub-metering data collection
- Power factor improvements
- Sales Tax Exemption



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Indoor Air Quality Assessment

System	CO2 Reading
Cafeteria	1341
Gym	988
Band Room	1394
Room 3	1193
Library	896
Room 26	708
Room 25	2139
Room 23	2487
Weight Room	1406
Nurses Station	420
Room 53	1630

System	Measure
Band Room	Increase MERV filter rating
Room 3	Stand Alone HEPA Filter
Room 25	Increase to Code Minimum
Room 23	Increase to Code Minimum
Weight Room	Stand Alone HEPA Filter
Nurse's Station	Install New HVAC System
Room 53	Increase to Code Minimum



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Electrification Opportunities

Electrification	
Chiller/Boiler	\$\$\$
Heat Recovery Chiller	\$\$
Domestic Hot Water	\$
Forklifts (N/A)	
Kitchen (N/A)	
Dryer/Process (N/A)	



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But not too flexible

- Define the scope of the study
- Know your budget/time limitations
- Goal is to generate ideas and prioritize next steps
- Market the energy efficiency programs to customers



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Onsite

- Like it or not; you're a salesperson now
 - If you don't sell these no one will
 - Encourage them to get data from their vendors
 - Be an expert in what you're selling
- Share success stories
- Know your audience
- Additional programs
 - Move projects to the next step by filling out paperwork onsite




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Follow up Programs

- Offer additional programs that keep customers engaged
 - Feasibility Studies/Level III
 - SEM
 - Retro-Commissioning Studies

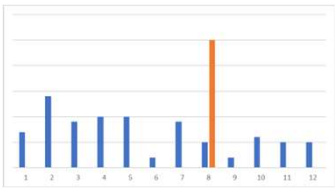


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Following up gets results


- Following up with customers generates program participation
- Additional Program Participation
 - 2 Retro-Commissioning Studies
 - 2 Audit requests
 - 1 Industrial New Construction



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Summary



- Listen to the customer
- Highlight additional programs
- Follow up

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Questions



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