

How To Choose the Right Electrical Submeter



It's well established that the best way to reduce energy consumption and save on building operating expenses is to give tenants full visibility of their electricity use. It's equally well established that the primary instrument for doing that is the electrical submeter.

But how do you choose the right submeter for the job?

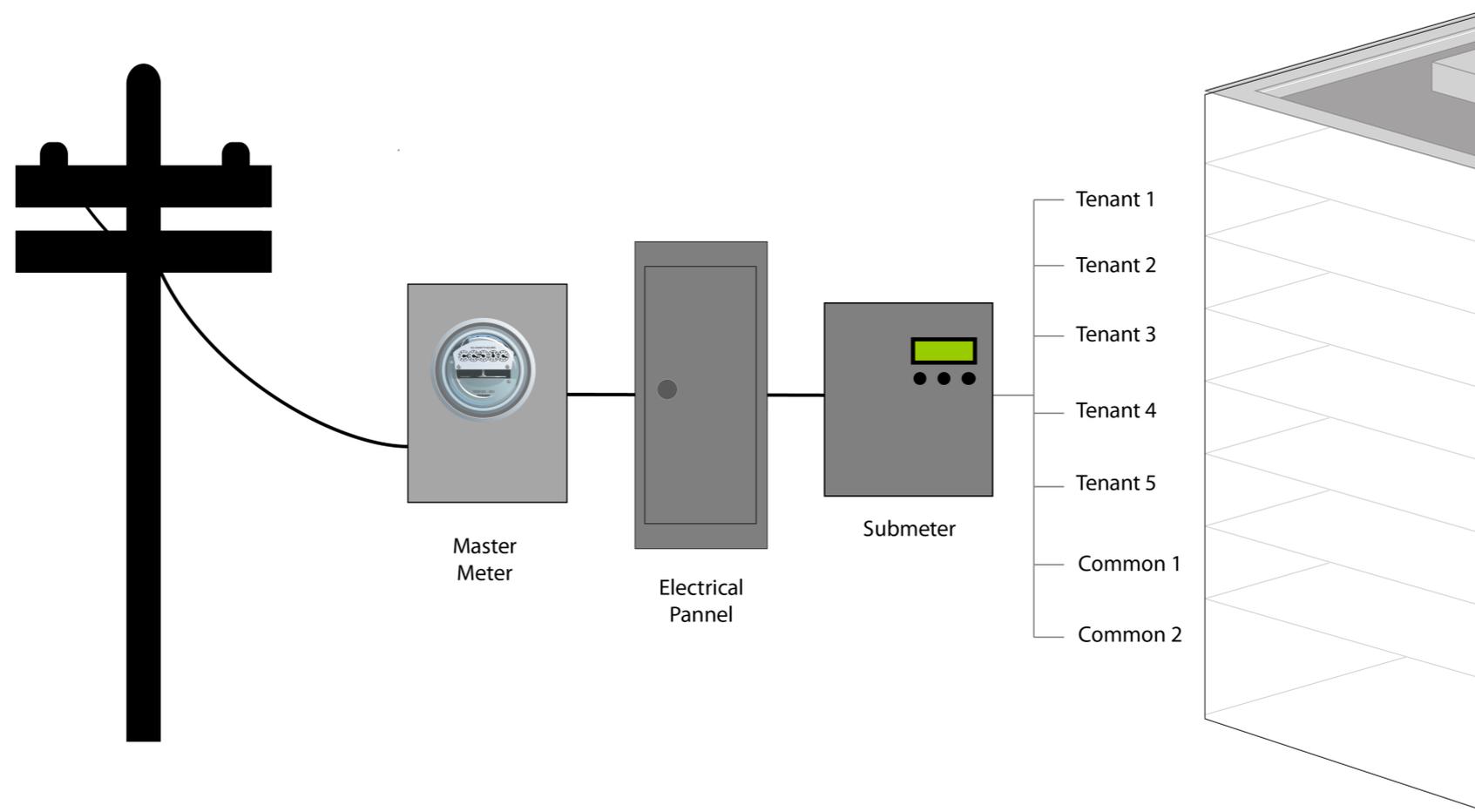


WHAT IS ELECTRICAL SUBMETERING?

Many multi-unit buildings use a single "master meter." Electricity comes into a building at bulk rate prices from the Utility and is distributed to tenants and building equipment after the meter.

Submetering is the measurement of electricity consumption beyond the master meter. Submeters (also referred to as power meters, electrical meters, and energy monitors) are installed after the master meter to measure individual electrical load.

Electrical submetering allows for the granular measurement of energy use, right down to the individual circuit. Building owners and property managers can pinpoint energy use, identify failing equipment, and allocate cost fairly by installing submeters.



Submeters can measure energy use for tenants, departments, building equipment, or any other electrical load.

WHAT ARE THE BENEFITS OF ELECTRICAL SUBMETERING?

Submeters allow for the granular measurement of energy use — right down to the individual circuit. Building owners and property managers can pinpoint consumption, identify failing equipment, and allocate costs fairly by installing submeters. Tenants pay only for the electricity they use, can account for their consumption, conserve energy, and lower their electricity bills.

REDUCE ENERGY USE, SAVE MONEY

There are several strategies for reducing energy costs, but few are as compelling and fundamental as submetering. Many studies have shown that using submeters to allocate charges based on actual energy use is one of the most effective ways to reduce electricity consumption.

Perhaps the most exhaustive study of applying electrical submetering to multi-unit buildings was undertaken by the U.S. Department of Energy as part of the Federal Energy Management Program (FEMP) in 2007.

How Much Could You Save ?

Action	Observed Savings	Reasons for Savings
Installation of Meters	0 – 2 %	Hawthorne Effect
Bill Allocation Only	2.5 – 5 %	Improved Awareness
Building Tune-up	5 – 15%	Improved Awareness and Identification of Simple Operations and Maintenance Improvements
Continuous Commissioning	15 – 45%	Improved Awareness, Identification of Simple Operation and Maintenance Improvements, Project Accomplishment and Continued Management Attention

This study showed that merely installing meters resulted in a 2% reduction in energy use through the Hawthorne Effect. ^[1]

But that was just the start. FEMP found that submetering as part of a coherent, continuous commissioning program of benchmarking, analysis, and remediation can result in 15% to 45% savings. ^[2]

1. *The Hawthorne Effect refers to how people modify their behaviour when being observed or measured.*
2. *Making the Case for Energy Metering, ASHRAE*



THINKING IN THREE-DIMENSIONS

Choosing the right type of meter means asking yourself three questions:

- Do I need single-point or multi-point meters?
- Should my meters be networked?
- Do I need a revenue-grade metering platform?

SINGLE OR MULTI-POINT METER

Single-point meters are useful for measuring specific points of interest in a building and have long been used in building management applications. But to gain enough knowledge to make successful energy management decisions, more granularity is required.

Doing this using single-point meters would require a tremendous number of them. In these situations, multi-point meters offer several advantages over single-point meters related to hardware cost and deployment.

Multi-point meters have a much smaller footprint than multiple banks of single-point meters, and lower per meter-point deployment and maintenance costs. Additionally, in commercial settings where building configurations often change, tenant moves are more easily accommodated when multi-point meters are deployed.



One multi-point meter (yellow circle) replaces multiple, single-point meters.

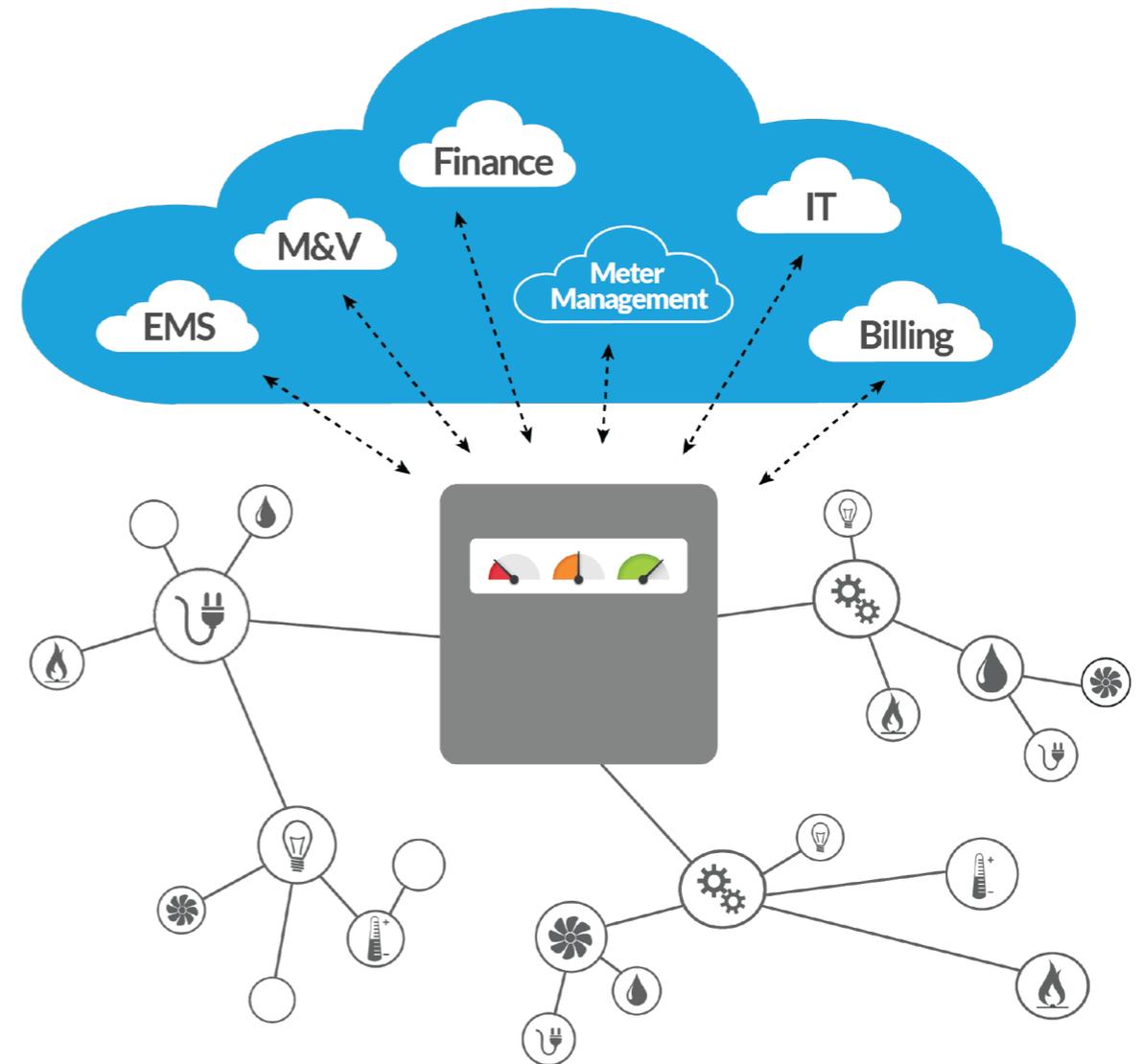


NETWORKED, OR NOT

This seems like an easy answer, but many meters are still being deployed today that need manual reading — costing time and money. And “orphaned” meters that have been forgotten completely is not an uncommon story in many facilities. So the answer is networked, of course.

But the question is not just about the absence of networking. It's also about what kind of networking you choose. Integrating with other systems (financial, building operation, IT, energy management, billing, etc.) is critical in today's connected world. Choosing submeters that are local area network-based (ethernet or wireless) and IP-centric allows them to “speak” to other systems and enables integration today and tomorrow.

The language your meters speak is an important consideration too. The free and unobstructed flow of meter information to all stakeholders, systems, and applications with a need to know should be your goal. To ensure that your data remains in your control and can be easily used today and tomorrow, your meters should use open protocol, non-proprietary data formats.



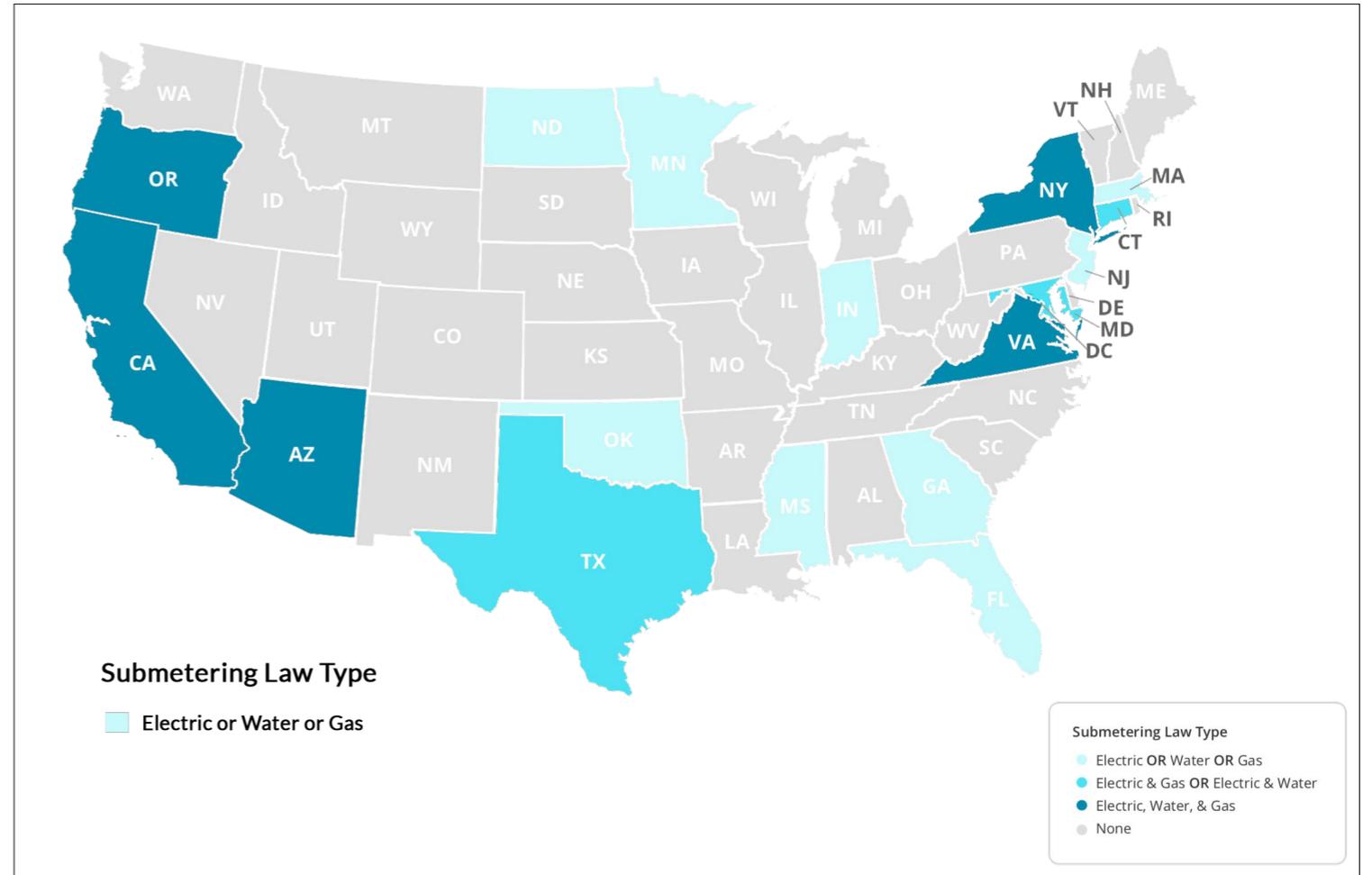
*Open protocol + Non-proprietary Data Formats =
Free Flow of Information + No Vendor Lock-in*

REVENUE-GRADE, OR NOT

There is a growing wave of regulation throughout North America focused on the metering of electrical consumption. Simply put, if money changes hands (as with government incentive programs or tenant billing), certified meters are becoming a legislated requirement.

Regulatory bodies are using the tried and true ANSI c12.20 0.5 accuracy class as the standard meters must meet – and requiring third-party laboratory certification to prove that they do.

To be clear, if a meter is only being used for internal purposes and not to bill tenants or receive financial remuneration, it does not have to be a regulated meter. In fact, there are no such rules for certification in some jurisdictions, even on financial transactions. But this is not a viable approach long-term – and regulation is destined to be introduced across North America.



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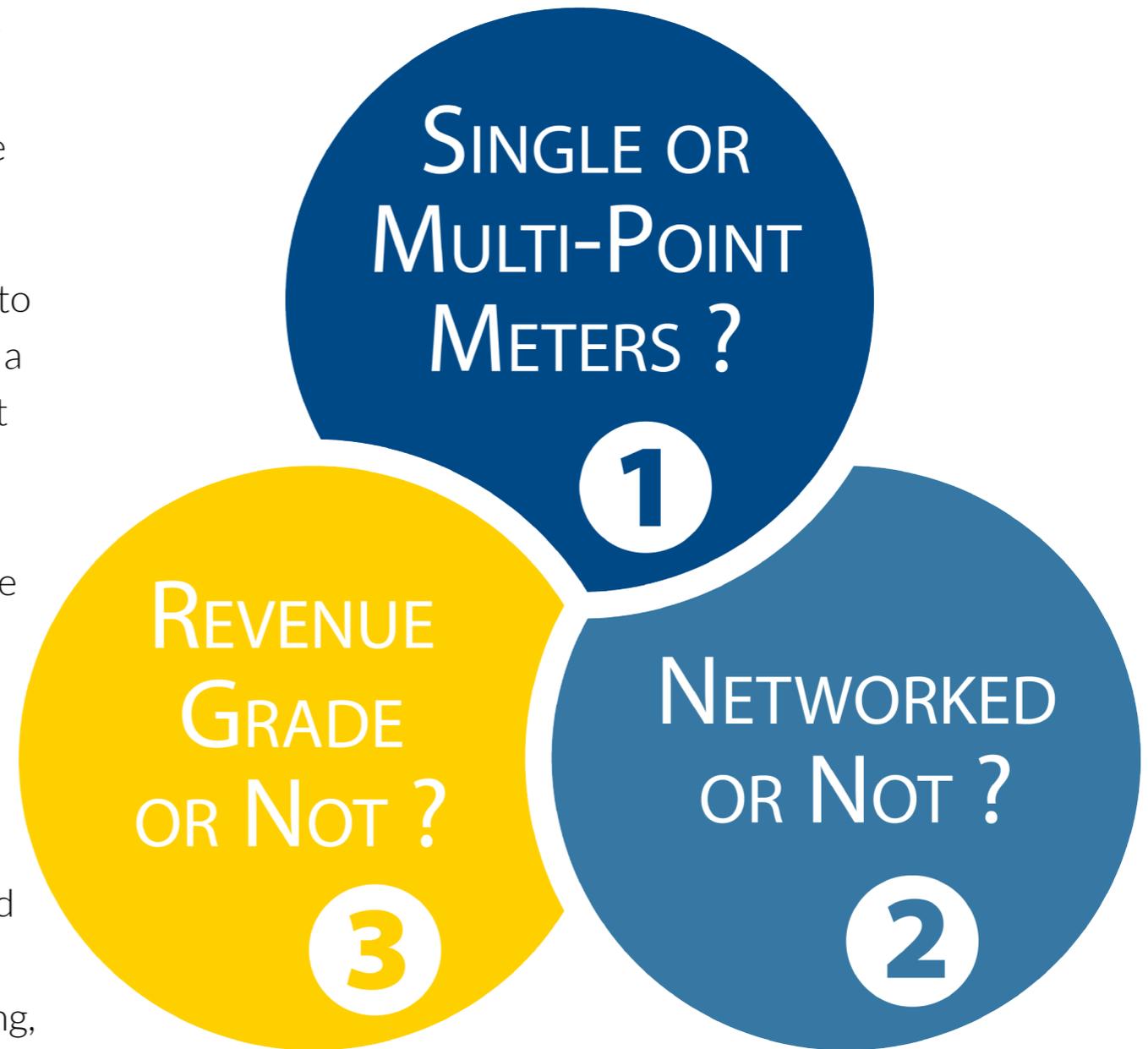


SO WHAT'S IT GOING TO BE?

When planning a project that requires metering or monitoring, property managers and building owners need to understand current requirements while keeping an eye on what the future might hold.

Ask yourself how many meter points you need to measure — today and down the road. If it's just a few, then single-point meters are likely the best route to go. But suppose you have several circuits to measure, and the allocation of those circuits is likely to change over time. In that case you might do better by taking advantage of the lower deployment, integration, and maintenance cost of multi-point meters.

Meters deployed today should be connected to a building's network. The cost-savings gained by avoiding manual meter reads and orphaned meters is reason enough alone. More compelling, however, are the benefits property managers and building owners gain when their energy data can flow freely to all of their building systems.



Benefits that include sending meter reads and pulse collection information to a billing agent while also sharing it with an energy management service for ongoing monitoring. Or being able to trial a new energy management analytics service while continuing to use your current vendor.

You can only realize these benefits if you use IP-centric, open systems meters.

Lastly, there are many reasons for property managers and building owners to consider using regulated meters over non-regulated. The primary one being the requirement for an approved instrument of measure when allocating energy costs to building tenants.

But even if current objectives are not for billing, goals change. With the small total incremental project costs associated with using approved meters versus unapproved — it makes sense to keep your options open.



Whatever metering equipment you choose, make sure you keep your options open so your metering investment will serve you well, now and in the future.



ADDITIONAL RESOURCES

For more on multi-point electrical submetering:

[Making the Case for Electrical Submeters](#)

[Show You the Money? Show Me the Meter!](#)

[From Space Saver to Information Cornerstone: The Evolution of the Multi-Point Electrical Meter](#)

ABOUT TRIACTA

Triacta Power Solutions designs and manufactures revenue-grade electrical submeters for tenant billing and energy management applications.

Triacta is a subsidiary of Metergy Solutions Inc., one of North America's most experienced submetering providers.

Long known for its high-reliability, precise, multi-protocol submetering products, Triacta's meters have been easily and successfully deployed by submetering companies, property owners, building system integrators, and local distribution companies since 2003.



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