Utility engineers and accountants too often calculate costs as well as pricing assumptions and projections right down to the penny. But is that the right approach? Is it possible that “sharp” pricing strategies do nothing more than alienate customers and create undue suspicion about the accuracy and transparency of your utility’s pricing structure?

The story goes that a visitor once approached a curator at the Museum of Natural History and asked, “How old is that dinosaur over there?”

“Seventy million and 37 years,” the curator said.

As the visitor marveled at the accuracy, the curator explained, “I’ve been working here for 37 years, you know, and when I arrived I was told that it was 70 million years old.”

This old joke reveals a basic principle behind numbers and how we react to them. The larger the number, the less likely people will believe in its accuracy—until the number is rounded off to a decimal place representing an accepted degree of accuracy. In the case of a dinosaur’s age, that would be a number in the millions rather than one so specific.

**SHARP NUMBERS CREATE DISTRUST**

Whenever a number is expressed to an unusually specific decimal place, it creates not only what mathematicians call a “sharp” number but also consumer distrust in its accuracy. Ask any engineering firm to estimate the cost of a multimillion-dollar water treatment plant, and you will probably get a number rounded off to the thousands—something like
$22,781,000. You won’t get an estimate for $22,781,903.13, because when you’re dealing with variables such as people, time, dirt, weather, and equipment, there is no way to forecast that level of accuracy.

In the story about the dinosaur, the curator’s belief in the animal’s exact age goes beyond credible accuracy into the realm of suspicion; that’s what makes it humorous. A number’s credibility rises relative to its size and the data that go into it. The data must be accurate or else the final number will not be believable. Thus, unless you are absolutely certain that the numbers going into your utility’s rates are 100% accurate, you should round them off to a decimal place that is believable.

For example, if you are estimating the cost of leaks or repairs, rounding off the estimate to a defensible decimal place will produce a final number that may better reflect the level of accuracy—and thus will be more acceptable to consumers.

Here’s another example. If I were to tell you that the number of accounts at utility A was a couple of thousand, you would probably interpret that to be about 2,000, plus or minus a hundred or so. Now suppose I tell you that utility A has 1,913 accounts. A number this specific indicates that I know the exact number of accounts. Given that the number can easily be quantified, you’d probably believe that utility A indeed has 1,913 accounts.

Now let’s look into the population served by utility A. Using the single-family-unit equivalent of 2.5, you would multiply each account by 2.5 to determine the estimated number of people within the utility’s service area. According to this formula, utility A, with 1,913 accounts, would have a population of 4,782.5. Because people cannot be halved (although averages can be), you probably would round this number up to 5,000, considering how the number was determined.

That’s the point. Whenever estimation is involved, the decimal placement must reflect the underlying accuracy of the data. In the case of utility A, the number 4,782.5 reveals the flaw in the methodology. By stating a population of about 5,000, you would be indicating accuracy within (plus or minus) a few hundred people.

On the other hand, let’s say that utility B has a total of eight accounts. You’d probably know exactly how many people that number represented—you could even go door-to-door in this case. Multiplying 8 by 2.5 indicates that utility B has a population of 20. Even though the number 20 is technically an estimate, if you told me you had eight total accounts and a service population of 20, I wouldn’t doubt that you were correct.

Now let’s make the number larger. Let’s say that utility C provides water service to 1.5 million people. In this case, you would probably assume the population number to be accurate within a few hundred thousand people. But what if I told you that my calculations show that 1,576,234 people are getting water from utility C? Would you accept that number as fact? Odds are you’d question how I came up with the number. That’s because the larger the number, the more we expect it to zero out to the smaller decimal places.

Similarly, the way utilities come up with their base rates is often too detailed. When an estimated cost takes the price of water down to the penny, customers perceive that cost as completely accurate, which as we all know isn’t exactly so.

EXACT PRICING MAY NOT BE THE MOST TRANSPARENT

Every year, most utilities sharpen their pencils and call on their accountants in order to ensure that their rates are defensible to customers. Being exact in communicating about rates is often considered the most transparent approach. Although exact pricing may appear to be the most logical, perhaps utilities should set rates that are adjusted to more closely align with how people perceive the actual numbers.

Basing rates solely on cost tends to make them accurate down to the penny. Yet this kind of accuracy might actually cause an opposite reaction from what utility officials might expect, unless the number of pennies on the end of the rate ends up being a number the consumer can trust. Here’s why.

Pricing is actually an area in which a great deal of research has been conducted to determine consumer reaction. For decades, behavioral scientists have worked hand in hand with retailers to discover how consumers react to different numbers that make up a price.

Studies show that the actual numbers used to arrive at a price play a major role in determining a product’s perceived value. For numerous reasons, consumers have an aversion to odd pricing. That’s why you probably won’t see soda priced at $1.13 or $0.91; you’ve probably paid $1.00 or $1.50.

In fact, scientific evidence indicates that consumers consider prices that end in odd amounts to be suspicious. That’s why retail prices are normally rounded to make them more palatable. Stanislas Dehaene, a mathematician and cognitive scientist, explains that sharp prices—such as $46.08—tend to make consumers nervous, whereas round prices—like $46—are actually perceived as more precise (Dehaene, 1997). Rounded numbers also convey value.

Of course, there is one notable exception to the rule of penny-specific or rounded pricing, and that’s with the use of the number nine. In the United States, a price ending in $0.09 conveys a much cheaper cost than the one-cent difference it normally represents. Even though we are all aware of the retailers’ game of offering a product for $29.99 rather than $30.00, we continue to fall for it. Pricing practices that rely on those nine pennies should be left up to astute retailers; utilities should avoid this practice when communicating rates.
A rounded base price such as $14 for utility service is actually perceived as more acceptable than a charge of $13.10—even though the more acceptable price is $0.90 more. Given the need to justify pricing, the $0.90 difference could be designated for infrastructure replacement costs. If a utility has a base rate of $46.08, it’s saying that the cost of delivering water to each customer is exactly $46.08. This implies that the utility knows exactly what it costs to deliver a customer’s water. However, unlike the number of accounts, calculating such an odd number for the price of water is up for interpretation.

Now add to this mix the fact that the larger the number, the less we trust its accuracy, and soon people will be questioning the cost of their water down to the penny. That’s because the larger the number, the more it is subject to error and thus the more we expect it to be rounded to a decimal place that is reasonable.

Consider the actual example of a utility that works with my firm. This utility asked us to take its billing statement and add definitions for what each service includes. Looking at the rates, I questioned the $43.12 base rate. I wanted to know not only what was included in that rate but also how it could be so accurate. “That’s the number we were given by the engineers and accountant,” the utility manager said. I asked him: “What if we rounded that number to $44?”

After a nervous pause, he said, “That’s what it costs, and we want to be transparent with our customers. How could we justify making the rate larger?”

Here’s my thinking behind this conversation. The numbers that went into what came out as a total of $43.12 were probably based on some assumptions. Given that the number of components that made up the total rate weren’t exact, you might assume that the total would never end up being an exact number either. In fact, the total would contain a margin of error that goes up along with the number of components and the size of the total number.

Consumers aren’t buying the odd rate, and neither am I. Although there is no doubt that the utility manager in this example wants to be transparent, I suspect the transparency got lost in the mathematics long before it reached the total. Perhaps that’s why we use so many words (about, around, roughly, approximately, and so on) to qualify estimates.

CONCLUSION
Think of it this way. I am proposing that when you establish the numbers that make up your utility’s final rate, don’t take them down to the penny. Consumers aren’t accustomed to this approach, nor do they believe in its accuracy. If you want to get them arguing about every penny the utility spends, then keep your rates in the pennies.

Big-picture thinking is actually your friend in this case. Use rounded-to-the-dollar numbers as the components that make up the total. Transparent? Yes, because by rounding the numbers from the outset, you will come up with a more acceptable rounded number as the total. Don’t go into the rate-setting process using estimated numbers that are specific down to the penny because this method will yield a total number of unfounded accuracy. It will be a sharp number and will convey a level of accuracy that won’t be trusted.

Although rates may seem to be solidly based on actual costs, in reality they are often based on assumptions associated with each component that makes up the total. Therein lies the problem. Given that these assumptions are probably accurate to the dollar rather than to the penny, the numbers going into the total rate should probably be rounded to an acceptable level. That way, consumers will perceive the total rate as realistic rather than questioning how your utility could possibly determine rates to the penny.

Given the inherent lack of precision involved in setting rates, consider looking at the numbers that make up your utility’s rates and how they are being perceived, especially if your billing statement is your primary communication with customers. Resist the temptation to estimate your rates down to unbelievable levels of specificity, unless you want customers to question your ratemaking methodology and how you spend each and every penny.

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