

GUÍA PRÁCTICA PARA ENTENDER Y REDUCIR TU CONSUMO ELÉCTRICO INDUSTRIAL

Electricity use, demand, and costs explained in practical terms.

INDUSTRY • BUSINESS • WORKSHOP • SME

A free resource from

EL ELÉCTRICO

Professional Electrical Engineering & Services

BUELE CAPITAL BUSINESS & INVESTMENT S.A.S.

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YOU DO NOT NEED TO READ THIS ENTIRE GUIDE

Go directly to the section that matches your operation.

POTENCIA Y ENERGÍA	Entender kW, kWh y por qué no son lo mismo.
MIS CARGAS	Identificar motores, bombas, compresores y otros equipos.
DEMANDA Y SIMULTANEIDAD	Entender por qué importa cuándo funcionan las cargas.
FACTOR DE POTENCIA	Comprender cuándo merece atención.
COSTO Y PRODUCCIÓN	Relacionar energía con dinero y productividad.
WHATSCASH ALPHA	Hacer una evaluación industrial preliminar.
TIER 1	Profundizar cuando una estimación ya no es suficiente.

SECTION 1

START HERE

Before buying equipment to save energy, first understand where the energy is being used.

A high industrial electricity bill does not necessarily mean there is a fault. It may reflect higher production, longer operating hours, new loads, or tariff changes. It may also reveal equipment running unnecessarily, motors operating under unfavorable conditions, low power factor, or high demand.

The first step is not replacing equipment.

The first step is understanding where, when, and how energy is used.

Three concepts you need

kW — KILOWATTS: represent power; they indicate the size of a load at a given moment.

kWh — KILOWATT-HOURS: represent energy used over a period of time.

$\text{kW} \times \text{operating hours} = \text{kWh}$

Example: a 10 kW load operating for 5 hours uses approximately 50 kWh. If this occurs for 20 days, that would be 1,000 kWh/month.

This relationship is a useful starting point. In industrial installations, duty cycles, actual load, efficiency, simultaneous operation, and other variables can significantly change the result.

[OPEN WHATSCASH ALPHA]

SECTION 2

IDENTIFY YOUR LOADS

Not all industrial loads use electricity in the same way.

An industrial installation may include three-phase motors, pumps, compressors, refrigeration, HVAC, resistive loads, furnaces, welders, variable-frequency drives, automated machinery, lighting, and auxiliary systems.

Some equipment runs continuously; some starts and stops; and some changes load during the process. That is why multiplying nameplate power by 24 hours can produce an estimate very different from actual consumption.

Create a basic energy inventory

EQUIPO	POTENCIA	CANTIDAD	HORAS/DÍA	DÍAS/MES
Compresor	7,5 kW	1	8	22
Bomba	3 kW	2	6	22
Iluminación	2 kW	—	10	26

You do not need absolute precision to begin. The initial goal is to identify which loads may represent a significant share of your electricity use.

Look at power + time

- Which machines run for the longest periods?
- Is equipment left on when there is no production?
- Do pumps or compressors run for unexpectedly long periods?
- Is HVAC operating in unoccupied spaces?
- Could some loads operate at different times?

[ASSESS MY LOADS WITH WHATSCASH ALPHA]

SECTION 3

MOTORS, DEMAND, AND POWER FACTOR

Here we stop looking only at the equipment nameplate and begin looking at how it actually operates.

Motors

To assess a motor more accurately, relevant factors may include voltage, current, power, power factor, efficiency, load percentage, operating hours, number of starts, and the mechanical condition of the driven load.

An oversized motor, a motor used incorrectly, or one tied to an inefficient process can create costs that are not apparent from its rated horsepower alone.

Demand and simultaneous operation

Two facilities can use similar amounts of energy over a month while showing very different demand profiles. The key question is: how many significant loads operate at the same time?

Simultaneous operation of compressors, pumps, HVAC, and machinery can create peaks worth investigating. When the tariff structure includes demand-related charges, this variable can have a direct financial impact.

Power factor

In facilities with motors and other inductive loads, a low power factor means, in simplified terms, that the installation must carry more current to deliver a given amount of useful power. This can increase current, losses, and loading on conductors, transformers, and other components.

Do not install reactive power compensation simply because a number appears low.

Correction must be properly sized and based on the actual conditions of the installation.

SECTION 4

SAVE ENERGY WITHOUT SACRIFICING PRODUCTION

Industrial electricity does not only cost money: it also helps generate revenue.

Industrial energy efficiency is not simply about using less electricity. A machine can use a great deal of energy and still be fully profitable because it is producing value.

The right objective is to use the energy required for production while avoiding energy use that creates no value.

Turn kWh into money

A basic estimate can be made using:

$$\text{Estimated energy use (kWh)} \times \text{energy cost (\$/kWh)}$$

An industrial electricity bill may contain other components. Therefore, an average energy rate provides an estimate and may not exactly reproduce the bill.

Compare equivalent periods

- kWh per working day.
- kWh per production hour.
- kWh per unit produced.
- Periods with similar production levels.

This helps distinguish between higher energy use because you are producing more and higher energy use because something has become less efficient.

Five questions you can answer today

- What are my five most significant electrical loads?
- How many hours does each one actually operate?
- Which ones operate at the same time?
- Did my energy use change without a proportional increase in production?
- Do I know approximately how much it costs to operate each major piece of equipment?

SECTION 5

WHATSCASH ALPHA

A preliminary assessment for industrial loads.

If your facility uses motors, pumps, compressors, three-phase loads, or other industrial equipment, a residential calculator may not be sufficient.

WhatsCash Alpha is designed to turn electrical variables and operating conditions into understandable estimates of energy use and cost.

What can it estimate?

- Active power.
- Monthly energy use.
- Operating hours.
- Estimated monthly cost.
- Estimated annual cost.
- Preliminary cost behavior of selected loads.

Depending on the type of load being analyzed, the tool may use data such as voltage, current, power factor, rated power, efficiency, number of units, utilization percentage, operating hours, operating days, and energy rate.

[OPEN WHATSCASH ALPHA]

WhatsCash Alpha provides preliminary estimates. It does not replace electrical measurements, power-quality studies, tariff analysis, or professional assessments.

SECTION 6

WHEN AN ESTIMATE IS NO LONGER ENOUGH

This is where you should stop guessing.

A calculator can help you understand how much a load may be using. But some questions require actual information from the facility.

- Why did my electricity bill increase?
- Where is the energy actually being used?
- Is there a penalty or avoidable cost?
- Is demand affecting my bill?
- Is there an economically justified opportunity for corrective action?
- Would a modification actually pay for itself through the savings achieved?

TIER 1 — ENERGY ANALYSIS

TIER 1 uses actual energy-use and operating information to identify opportunities that an automated estimate cannot determine on its own.

The analysis can begin with utility bills, equipment data, photographs, videos, available measurements, and technical documentation, and go deeper only when the case requires it.

[LEARN ABOUT TIER 1]

WhatsCash Alpha is an entry point, not a requirement. If you already know the problem and need repair, installation, automation, or project execution, you can go directly to the service catalog.

[VIEW SERVICE CATALOG]

SECTION 7

BEFORE YOU INVEST

Measure first. Analyze next. Then decide.

Do not start by buying capacitor banks, replacing motors, installing variable-frequency drives, or replacing machinery simply because someone promises to reduce your electricity bill.

An efficiency investment makes sense when the expected savings, reliability, and return justify the cost.

WHAT DO YOU NEED?

[I WANT AN ESTIMATE — OPEN WHATSCASH ALPHA]

[I WANT TO UNDERSTAND MY ENERGY USE — LEARN ABOUT TIER 1]

[I KNOW THE PROBLEM — VIEW SERVICE CATALOG]

[I NEED REMOTE CONSULTING — REQUEST AN ASSESSMENT]

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Information to understand. Technical expertise to diagnose. Technical capability to execute.

TECHNICAL NOTE

The examples and calculations in this guide are for reference only. Actual energy use depends on the characteristics, operating conditions, and utilization of each piece of equipment. This guide does not replace measurements, inspections, manufacturer instructions, or technical assessments when required.