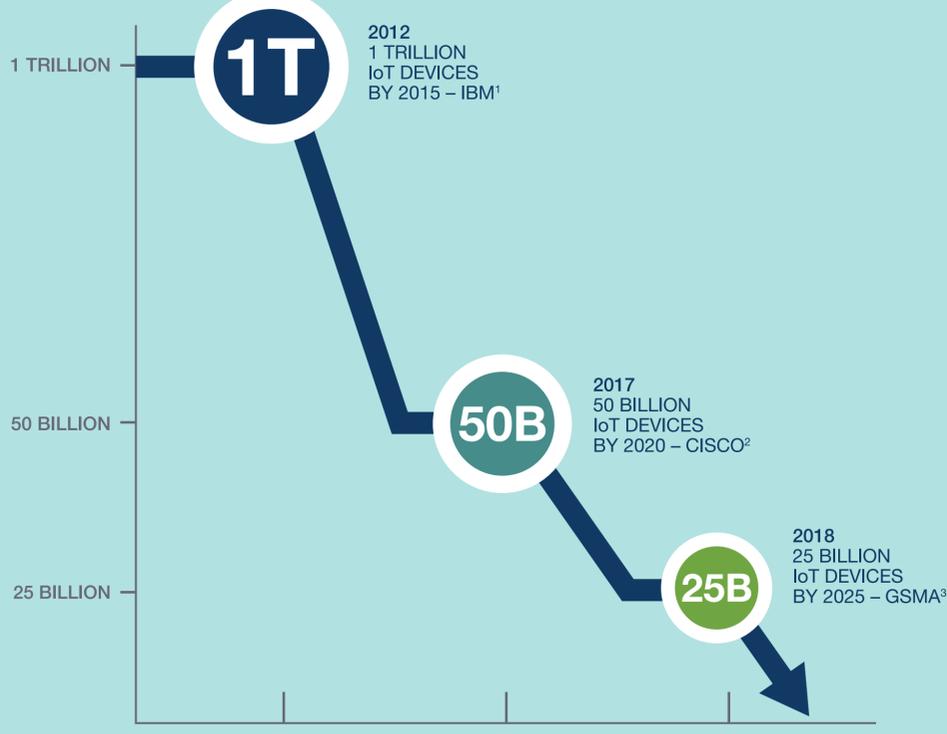


# WHY ARE IoT EXPECTATIONS SHRINKING?

## PREDICTED IoT DEVICES



## WHY THE DECREASE IN EXPECTATIONS? ONE CONTRIBUTING FACTOR: **BATTERY LIFE.**

In a 1 trillion sensor world, there would be:

**273,972,603**  
BATTERY REPLACEMENTS  
EVERY DAY

With a 'best-case' breakthrough battery with a 10-year lifetime.

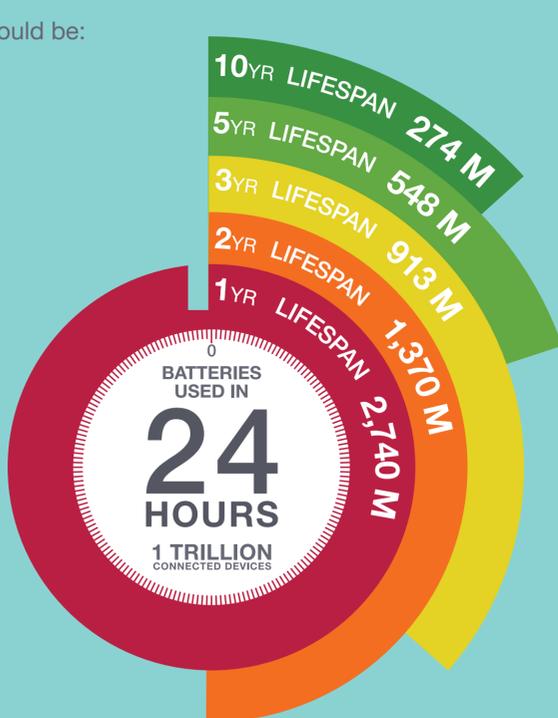
OR

**913,242,009**  
BATTERY REPLACEMENTS  
EVERY DAY

Assuming a more realistic three-year battery life.

What will it take to replace 913 million batteries per day?

**228,310,502**  
HOURS  
PER DAY



Assuming a standard 8-hour workday, that means you'd need to have **28,538,813** people devoted to nothing else but changing batteries just to keep all those sensors alive. That's greater than the entire population of Australia!

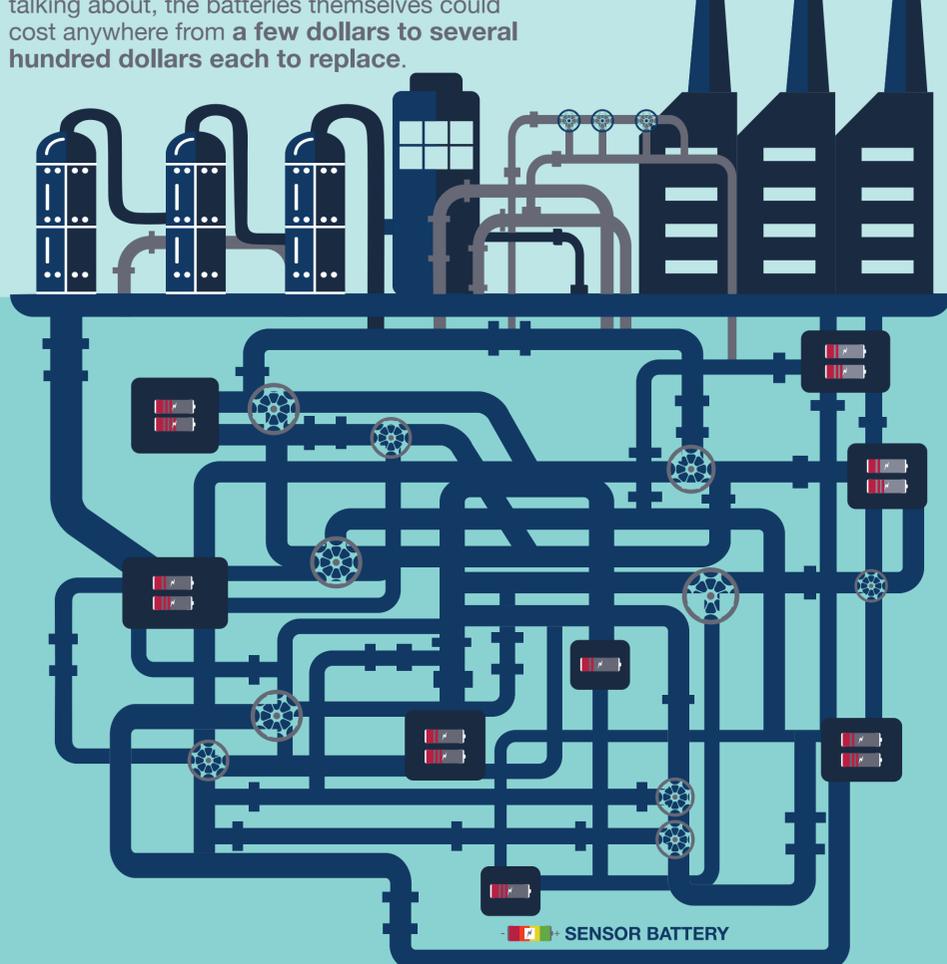


## NOW, LET'S EXPLORE WHAT THIS WOULD MEAN FOR YOUR INDUSTRIAL FACILITY

Imagine you were to deploy 10,000 Industrial IoT devices across your facility—sensors strategically placed to transmit real-time data about the health and performance of your machines and equipment, to monitor temperature and air quality in various sectors of the facility, to check for toxins that might have leaked, to relay the status of your steam traps, HVAC systems, and other vital infrastructure.

Going back to the realistic notion of a 3-year average lifetime in those 10,000 batteries, your team would be replacing roughly **3,333 batteries each year, or about nine every day.**

Maybe nine batteries per day doesn't sound so bad, but depending on the type of devices we're talking about, the batteries themselves could cost anywhere from **a few dollars to several hundred dollars each to replace.**



**But, more importantly:**

"The cost of getting to a remote sensor to change a battery is often much higher than the cost of the battery itself."<sup>4</sup>

AN EXTRA

$$9 \times 15 = 2.25$$

[BATTERIES] [MINUTES PER BATTERY] [HOURS PER DAY]



## 5 REASONS BATTERIES ARE OBSTACLES TO COST-EFFECTIVE INDUSTRIAL IoT



1. Batteries' finite lifespans can lead to gaps in mission-critical data.
2. Ensuring battery-powered IoT sensors are functioning will require manual inspections.
3. To maximize battery life, sensors are often configured to transmit data less frequently.
4. A battery's physical dimensions can limit sensor functionality.
5. Batteries can create safety risks and cause environmental harm.

## THE SOLUTION? REMOVE THE BATTERY!

PsiKick self-powered sensors run indefinitely by harvesting energy from their immediate environment, removing the need for batteries.

For more information, check out PsiKick's new white paper [here](#).



1. <https://spectrum.ieee.org/tech-talk/telecom/internet/popular-internet-of-things-forecast-of-50-billion-devices-by-2020-is-outdated>  
 2. [https://www.huffingtonpost.com/entry/cisco-enterprises-are-leading-the-internet-of-things\\_us\\_59a41fcee4b0a62d0987b0c6](https://www.huffingtonpost.com/entry/cisco-enterprises-are-leading-the-internet-of-things_us_59a41fcee4b0a62d0987b0c6)  
 3. <https://www.gsma.com/newsroom/press-release/new-gsma-study-operators-must-look-beyond-connectivity-to-increase-share/>  
 4. <https://www.ecnmag.com/article/2017/04/selecting-and-testing-batteries-ensure-iiot-device-success>