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Energy monitoring with **LoRaWAN** or **NB-IoT**? Why choose?

When it comes to energy monitoring, some swear by **LoRaWAN**:

- Long range
- Low power
- Private or operated network

Others bet on **NB-IoT / LTE-M**:

- Wide coverage
- Low power
- Larger payloads

Some argue:

“As soon as there are several sensors, installing a LoRaWAN gateway is the only sensible option.”

Others reply:

“Using multiple NB-IoT/LTE-M sensors within the same building still makes perfect sense.”

So… who’s right?

Big words, simple concepts

Just to make sure we're all on the same page, here's a quick overview.

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Long range

It refers to how far data can be sent over the air. Easy to grasp … until you try to put numbers on it.
In open areas, it can mean kilometers. In buildings, it may drop drastically, down to hundreds, or even tens of meters depending on walls and obstacles.

Low power

It is usually about how long a battery-powered sensor can operate. If average power consumption is low, battery life is long.
For energy monitoring, 3 years is often acceptable, though some expect 10 years or more.

Private operated coverage

"**Operated**" means a connectivity provider (typically a telecom operator) runs a public infrastructure (city-wide, nationwide…). **NB-IoT** is always operated. **LoRaWAN** can be either operated or private.
"**Coverage**" means whether sensors can connect from where they're installed — which is often non-negotiable (e.g., where the meters are).
NB-IoT is said to offer global coverage, since many telcos provide it. But just like cell phones, that doesn't mean every corner is covered.

Big payloads

This refers to the amount of data a sensor can send in one transmission.

- **LoRaWAN** sensors typically send up to 50 bytes per message.
- **NB-IoT** sensors can send hundreds to thousands of bytes.

If it’s simple… why is it so tricky?

Maybe these pretend conversations will help highlight the nuances:

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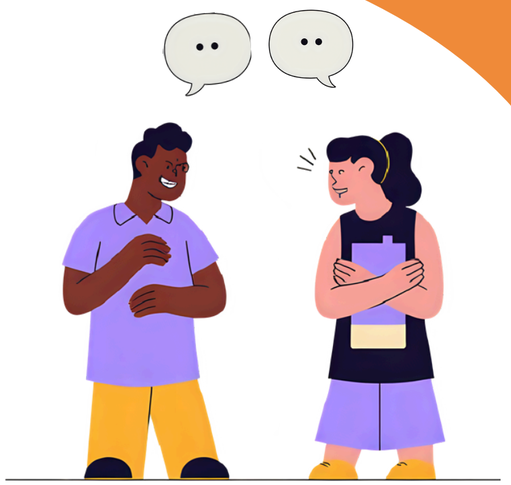

LoRaWAN

NB-IoT

One sensor per site? Go with **NB-IoT**!

But what if there’s a cheaper **LoRaWAN** operator in the area?

Still, you might need to deal with several operators across sites. And **LoRaWAN** isn’t available everywhere. Also, frequency plans vary between countries.

Fair. But if I need near real-time data and it’s battery-powered, **NB-IoT** won’t last long…

With two transmissions per day, the battery will be fine and it’s near real-time

No, it’s not…

But who needs real-time?

Well….

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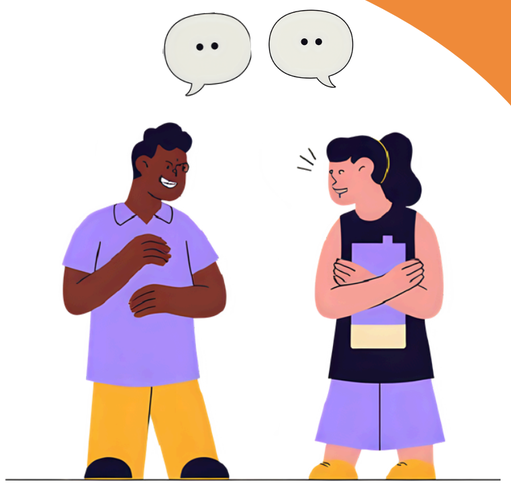


LoRaWAN®

NB-IoT™

Several sensors per site? Use a **LoRaWAN** gateway!

But gateways aren’t cheap

Some cost just over €100

Yes, but they don’t have cellular connectivity. Professional gateway with 4G is more than 300€!

OK, but a least you can place the gateway for optimal reception, unlike sensors.

And if one sensor’s out of range of the gateway?

Well…

3 Use cases: the devil is in the details

Simple case : 1 or 2 sensors per site

Example: optical reading of electricity and gas main meters.

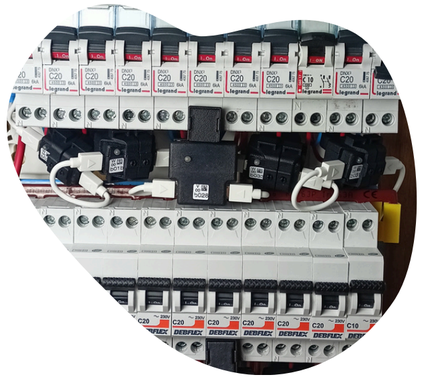
NB-IoT/LTE-M is often the best option … unless a reliable **LoRaWAN** operator is present locally.

In Fludia's range, this means FM442e/FM442g (NB-IoT/LTE-M) as first choice and FM432e/FM432g (LoRaWAN) as fallback

But it's wise to **bring both options** to site, especially if coverage is uncertain.

Example: carry an extra LoRa sensor and a " LoRa to NB-IoT" bridge (F-Bridge) in case coverage isn't available right at the meter, but can be found elsewhere in the building.

3 Use cases: the devil is in the details



Intermediate case: around 5 sensors per site

Example: 3 on main meters (elec/gas/water) & 2 for submetering or temperature

Now it gets more complex: all options, including a private **LoRaWAN** gateway, compete as valid economic choices.

Our advice:

- If future expansion is likely, with possibly quite a few additional sensors
  ➡ **LoRaWAN sensors + gateway**
- If reducing hardware cost is key and all needed sensors are in our portfolio
  ➡ **LoRa point to point sensors + F-Bridge**
- If installing a gateway is hard (no secure spot, risk of unplugging…)
  ➡ **NB-IoT sensors,** unless an **operated LoRaWAN** network is available

And as before, it pays to not put all your eggs in one basket (i.e., be ready with a plan B on install day).
In this spirit, tagawatt submetering system, for example, can be reconfigured on-site to use:

- NB-IoT / LTE-M
- LoRaWAN
- LoRa point-to-point (combined with an F-Bridge)

3 Use cases: the devil is in the details

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LoRaWAN

NB-IoT

Advanced case: deployments on many sites, some with 1 sensor, others with 20+

Some may think: “Since some sites clearly justify a **LoRaWAN** gateway, let’s do that everywhere.”

But we’d argue **that’s not optimal**, either economically or operationally.

Why?

- Installing a gateway for just a couple of sensors raises hardware and setup costs unnecessarily
- In this case, direct connection to an operated network is often faster and cheaper, especially if data plans are low-cost
- Even in buildings with many sensors, and therefore a private gateway, you might have a few sensors out of range. Instead of wasting time moving the gateway or adding one, it’s often smarter to switch these few sensors to **NB-IoT/LTE-M**

So for large, diverse deployments, **being able to mix technologies** brings real benefits.

More in a white paper, "soon"*

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*My overly friendly chatty copywriter is fast, but I am not!