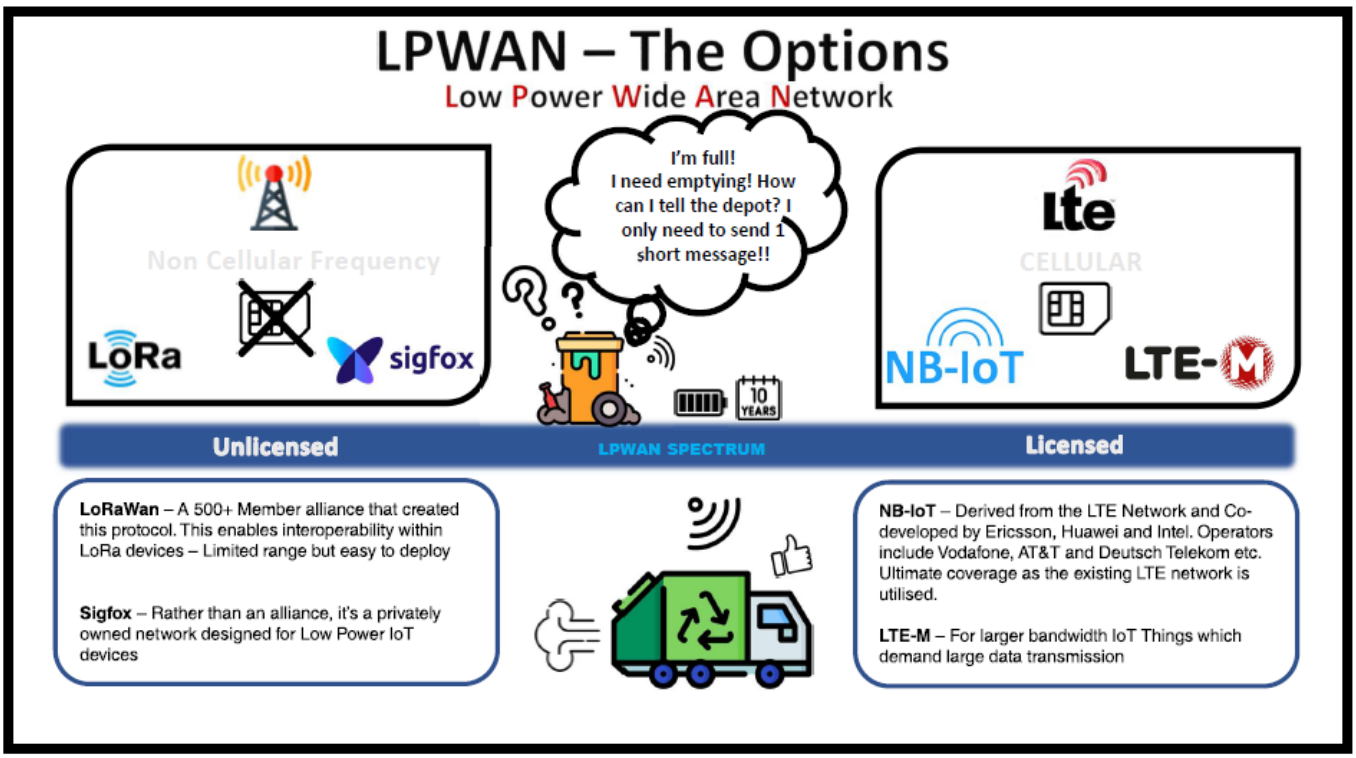
In a connected digital business or consumer world, there are certain applications or “things” that require wireless data transmission. However, they only require a small dose at a time whenever needed. This not only makes the application or “thing” fully connected it also does not consume a lot of power.

This technology, certainly in the IoT space is called LPWAN. Low Power Wide Area Network. The beauty of LPWAN is designed to not only reduce power consumption, but also to maximise network coverage and of course reduce overhead costs.

I’ll try to simplify…

LPWAN are broken down into two groups. Firstly, there are Licensed and Unlicensed LPWAN protocols.



**LoRaWAN:**
(Long Range Wide Area Network) and this type of LPWAN that does NOT require cellular connectivity. LoRaWAN uses the lowest and narrowest of bandwidths in the LPWAN family and can only send a limited number of messages per day. LoRaWAN are ideal in settings when a cellular network is not so attainable. Also, it's not a case of powering up your "thing" and choosing LoRaWAN. As your "things" must be certified to communicate to a LoRaWAN network and of course your network needs to be configured.

**Sigfox:**
Is the second protocol of the Unlicensed LPWAN family and is named by the French company Sigfox who owns and developed this technology. These networks are "ultra narrowband" (meaning they use very small frequency bands), and each country only has a single Sigfox network operator.

N**B-IoT:**
The first of the Licensed Bands is NB-IoT which stands for Narrowband Internet of Things. It's a specially adapted cellular network that can take advantage of unused (but licensed) bands in the radio frequency spectrum. NB-IoT was designed to address some of the past challenges of using cellular connectivity in IoT devices, namely, its power consumption.

NB-IoT devices have the ability to use a Power Saving Mode, where they go to sleep when not in use. This enables NB-IoT devices to operate for years on a single battery charge.
NB-IoT networks use existing LTE towers and antennas, as this infrastructure is already in place and generally well established. Whereas LoRaWAN and Sigfox networks are still on an ongoing "growth" project, the advantage of NB-IoT enables simplicity as you just connect your "things". This allows a "ready to go" solution for manufacturers to create Internet-enabled devices.

In terms of range, coverage and deployment cost, there's no comparison. For mobile applications like asset tracking and supply chain logistics, cellular LPWANs are almost always the most preferred choice.

**LTE-M:**
Known as Cat-M1 (Category M1), 4G LTE-M is an extension of 4G LTE technology that uses the same power-saving features as NB-IoT. NB-IoT and LTE-M networks rely on the same infrastructure as 4G LTE.

4G LTE-M Networks have a big advantage over NB-IoT networks: It has a far better data rates, which allows your "things" to quickly transmit much larger data packages. Like NB-IoT networks, LTE-M networks are ideal for long-range mobile applications like asset tracking, but they're also well-suited for applications that have more data consumption body cams and analytics-related devices. The more data you need to send or receive, the better LTE-M is in comparison to NB-IoT. It can transmit and download faster, which means your device stays online for less time.

Cellular LPWANs continue to develop, and in time we will see conversion of the LTE Cat-M1 infrastructure to LTE Cat-M2 which will provide greater bandwidth, and greater upload and download speeds, making this a very attractive technology. Meanwhile NB-IoT's evolution will continue in the form of LTE Cat-NB2.

All in all, applying LPWAN to your "things" needs certain conditions to match your needs as explained above but all are serving the same purpose, which is to reduce power consumption.