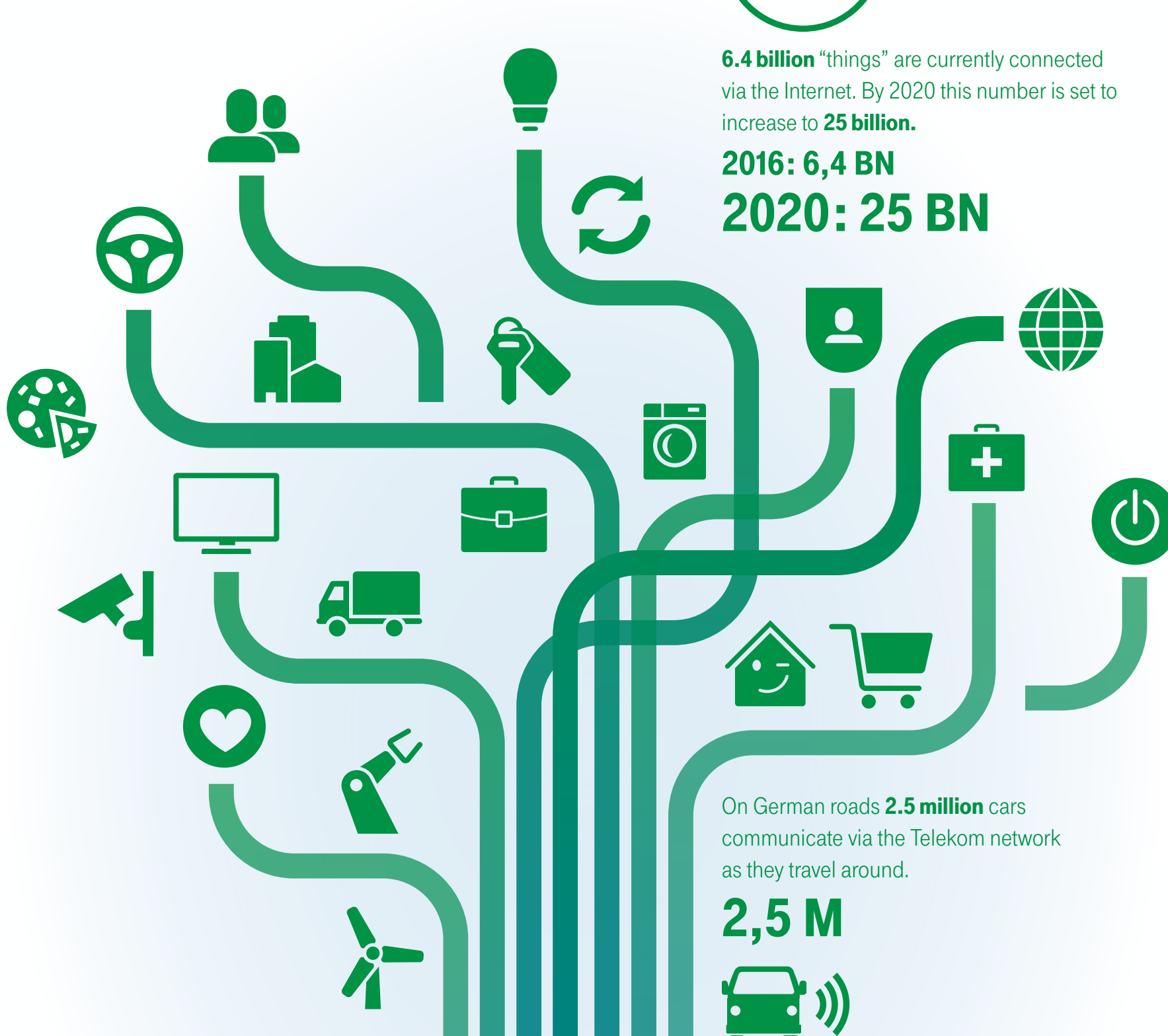


THE EVOLUTION OF THE INTERNET OF THINGS



6.4 billion "things" are currently connected via the Internet. By 2020 this number is set to increase to 25 billion.

2016: 6,4 BN
2020: 25 BN



On German roads 2.5 million cars communicate via the Telekom network as they travel around.

2,5 M



EVERYBODY BENEFITS

By 2025 the Internet of Things could lead to a global economic added value of up to \$11.1 trillion.

+11,1 TRN \$



30 percent fewer engineer callouts are expected to result from remote maintenance of connected elevators.

40 percent of inner-city traffic consists of cars looking for somewhere to park. The IoT can help reduce this figure significantly.

-30%

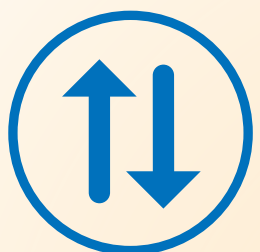
40%



DATA VOLUMES ARE RISING RAPIDLY

Data traffic on the IoT is set to rise from 305 million terabytes now to 1.9 billion terabytes in 2024.

2016: 305 M TB
2024: 1,9 BN TB

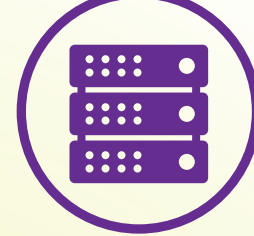
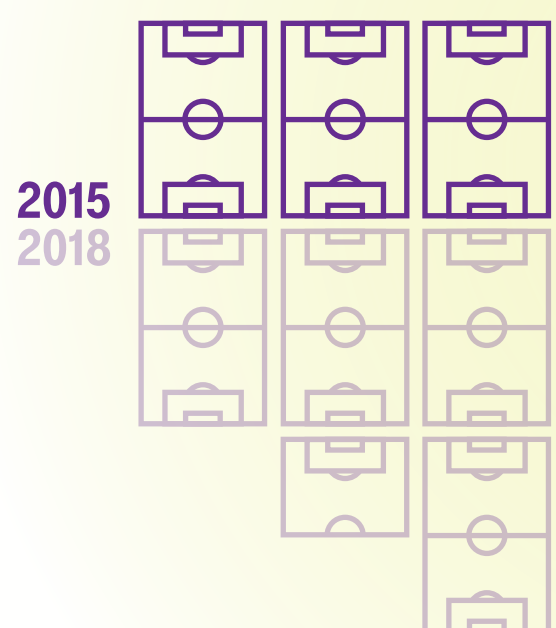


Telekom currently relays more than 1.8 million terabytes of data a month through its networks. That corresponds to relaying the content of around 14 million iPhones.

14 M

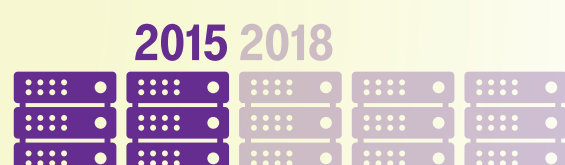


In **Biere, Germany**, Telekom set up in 2015 a data center covering a **surface area of three soccer fields**. A year later, demand has already risen so fast that the Group is enlarging the facility. By 2018 it is set to cover a surface area of **7.5 soccer fields**.



NO CLOUD, NO INTERNET OF THINGS

The original two data center modules will then be five in number, each with a storage capacity of around 30 petabytes – enough for 30 billion books.



30 BN

The data center can receive and process up to 259 terabytes of data traffic per second (physical). That corresponds to 7.4 billion HD streams running in parallel.

7,4 BN



DATA NETWORKS NEED EXPANSION AND CONVERSION

For applications that require a high range and low energy consumption **Narrow Band IoT is the best option**. NB-IoT modules can run for up to ten years on two AA batteries.



With a data transmission rate of more than 10 gigabits per second or a short 1-millisecond latency, **5G will become the enabler of data-intensive and time-critical applications** such as connected driving. Blinking, for comparison, takes 100 milliseconds.



With over 400,000 kilometers, Telekom operates **the largest fiber-optic network in Germany**. For comparison: the entire German autobahn network is 13,000 kilometers long.

