

## Best Cases on Transition to Green IoT

Presented by:



04/07/2023

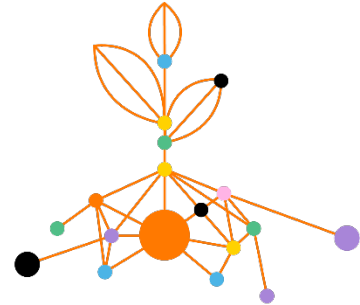


# Transition to Green IoT

Most of the IoT solutions are made to optimize resources and thus are serving the energy consumption reduction

## How to make the IoT Greener?

- ✓ **Act on the device lifecycle**
- ✓ **Act on the power consumption and data storage**
- ✓ Act on the backward compatibility of a solution to recycle existing IoT devices
- ✓ Create interoperability to enhance existing IoT platforms



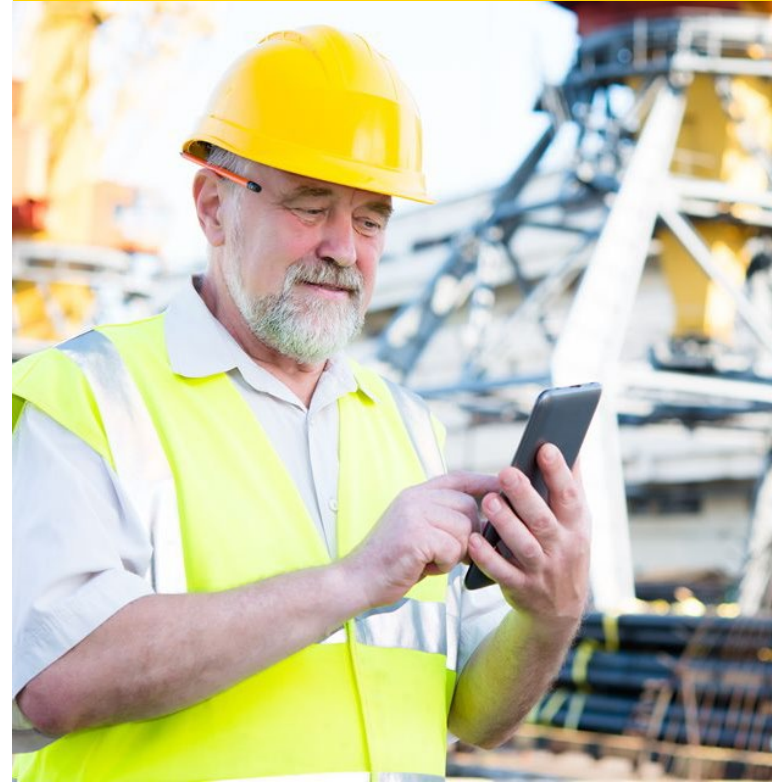
# 2 Best Cases at Orange Innovation



## Computing Cubes



## Zero Energy device



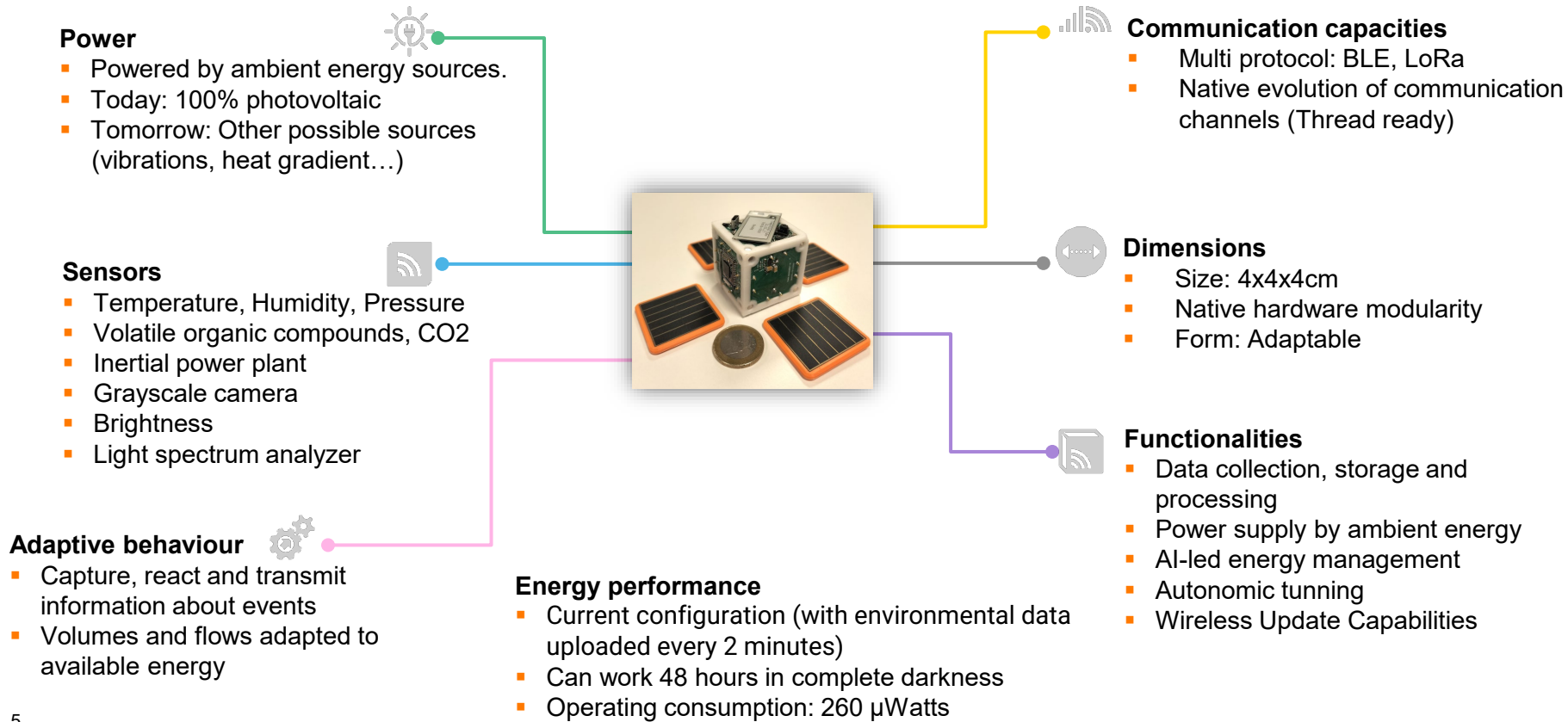
# Computing Cubes

modular and energy-autonomous multi-sensor nano-computers



# Creating Computing Cubes

A global approach focused on energy frugality for each of the functional blocks



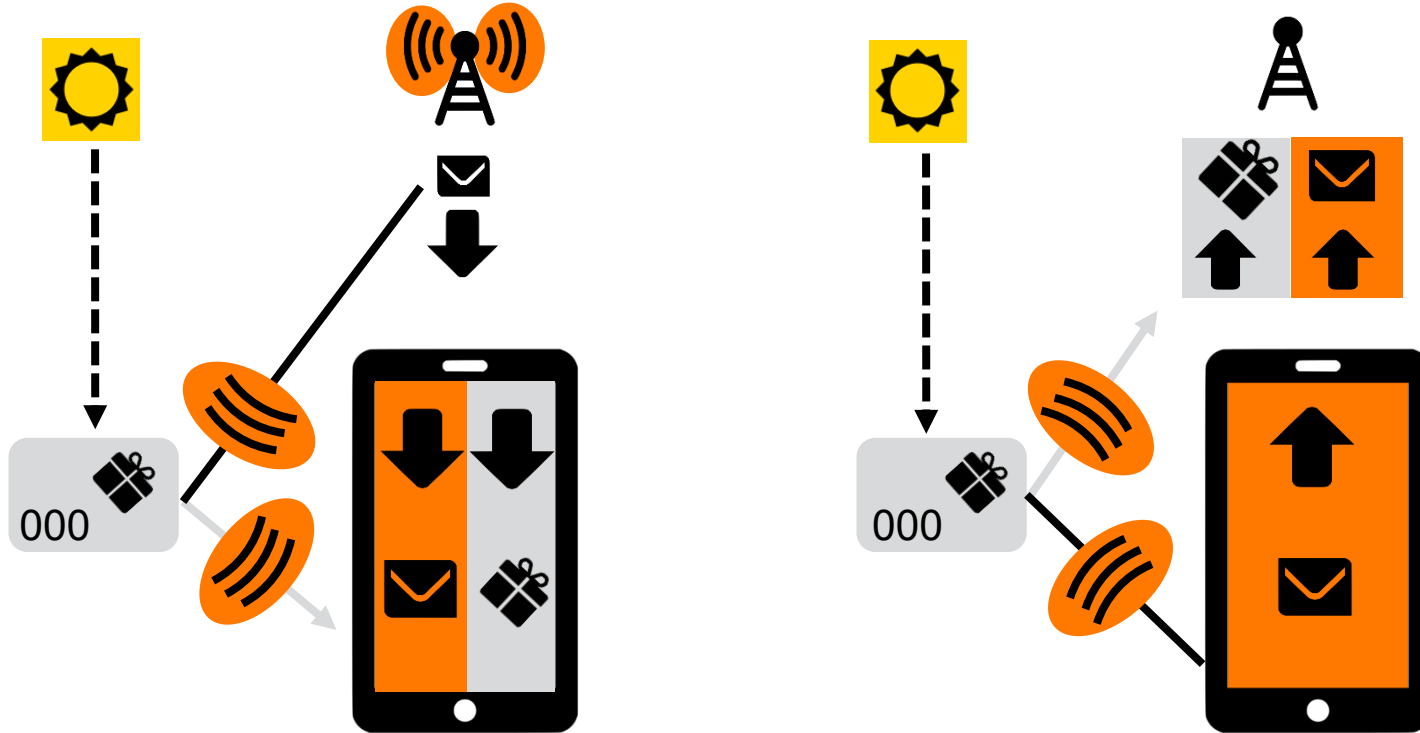
# Zero Energy Devices (ZED)



# A new type of device for future IoT

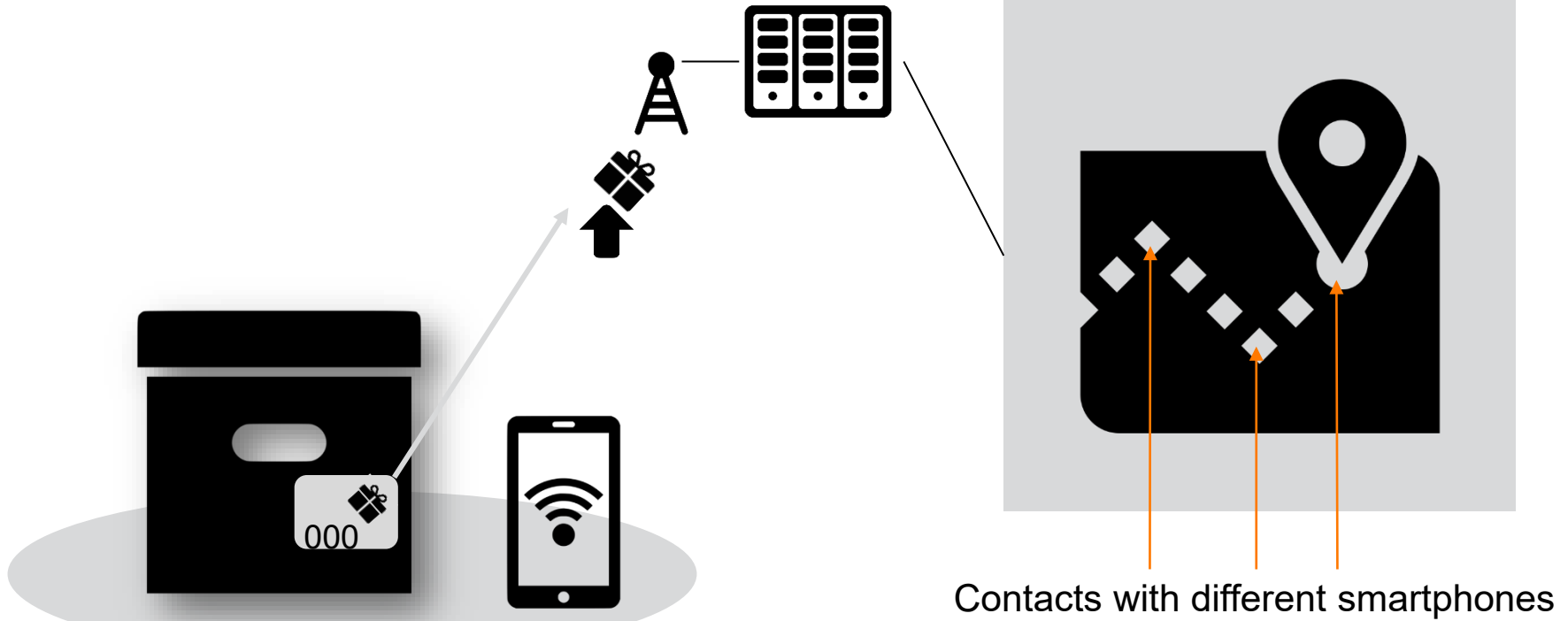
« 000Device » communicates with

- zero-added **infrastructure** (by reusing network and all smartphones),
- zero-added **wave** (by recycling ambient waves), and
- zero-added **energy** (by harvesting ambient energy).



## Tracking with zero-added infrastructure, wave and energy

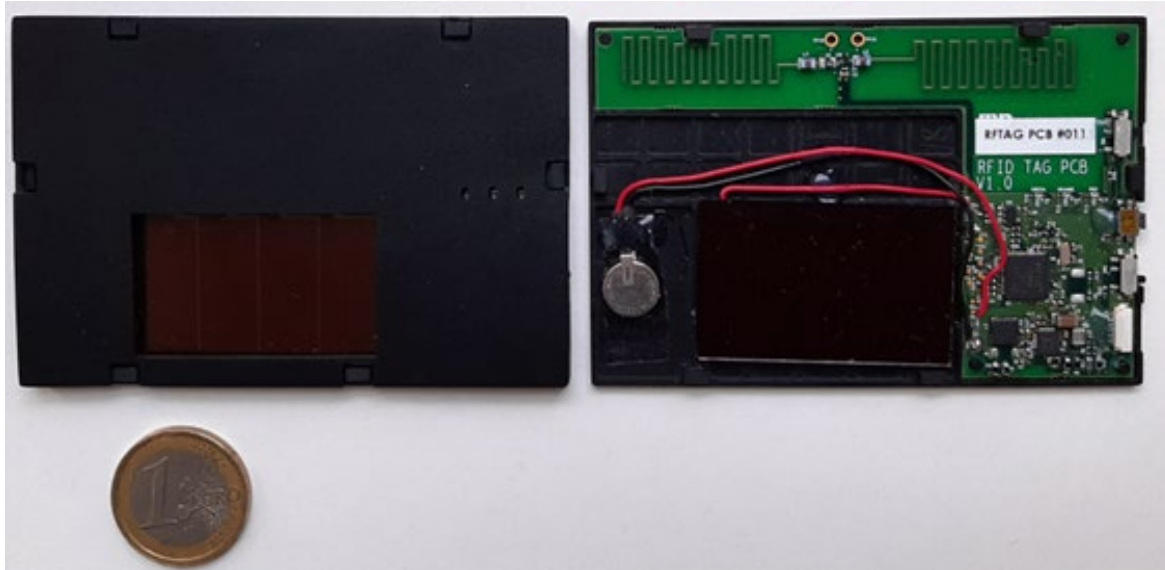
Each contact of « 000Device » with **any smartphone** is recorded.



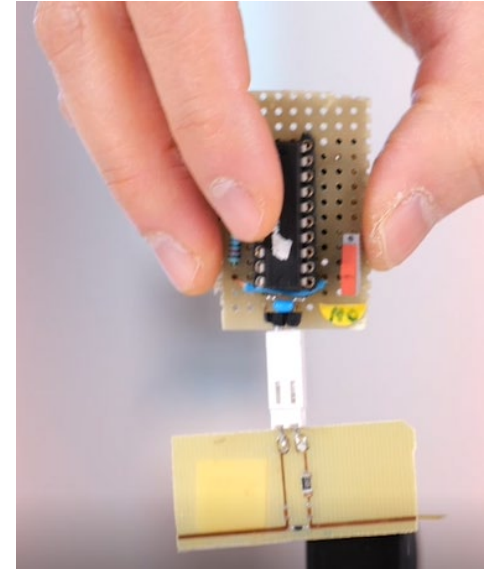
The ZED positioning accuracy is the same as that of the smartphone



## Our « 000Devices » prototypes



Solar tags recycling TV/4G



5G tag

# Preparing 6G

## Orange's Vision for 6G White Paper: ZED for Exposure-aware communications.

- <https://hellofuture.orange.com/app/uploads/2022/03/White-Paper---Oranges-vision-for-6G---March-2022.pdf>

## 2 Awards received by Orange:

- 2021: Best Paper Award of the IEEE International Conference on RFID Technology and Applications.  
D. -T. Phan-Huy, D. Barthel, P. Ratajczak, R. Fara, M. d. Renzo and J. d. Rosny, "[Ambient Backscatter Communications in Mobile Networks: Crowd-Detectable Zero-Energy-Devices](#)," 2022 IEEE Journal of RFID. Extended version of the RFID-TA Conf. Paper.
- 2022: ZED is one the 3 key innovations of the “Hexa-X” European 6G flagship project awarded by the European Union Innovation Radar programme.  
<https://hexa-x.eu/innovation-management-in-hexa-x-received-the-first-ec-awards-by-the-eu-innovation-radar-programme/>



Thank You



04/07/2023

