MWC GSMA | BARCELONA 26 – 29 FEBRUARY 2024

Ambient IoT in Release 19 - Opportunities, Implications. Issues, and the Trillion Thing Disruption

Wednesday 28 February, 2024 9.00 - 11.30
Gran Fira, Barcelona Hall 8, Theatre 4

Steve Statler
Chief Marketing Officer
Wiliot

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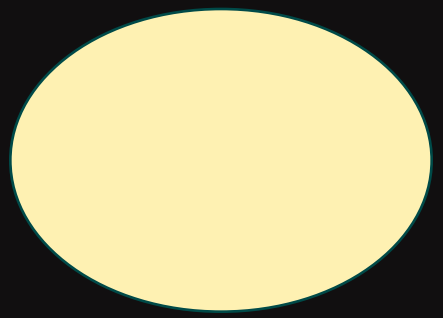
THALES
Building a future we can all trust

Wiliot

Acknowledgement / Disclaimer

- Wiliot is one of many contributors to the Ambient IoT features in Release 19
- The standard will be shaped by many powerful entities within 3GPP
- Wiliot contributes experience of the first commercialized ambient IoT offering deployed at scale and work with many of the F500

This is how we run our supply chains today



FREECIV.NET
Map
Nation
Research
Players
Options
Manual
Turn Done (59s)
Messages
Toulouse is finished building Archers.
Year: 1768 AD
Archers lost to an attack by the Iranian Destroyer.
Archers lost to an attack by the Iranian Destroyer.
Chernigov
Marseille
Lille
Toulon
Paris
Clermont-Ferrand
Lyon
Toulouse
Nice
Volodimer
Bordeaux
Montpellier
Viseu
Aveiro
Vila Real
Guimarães
Braga
Sintra
Porto
Coimbra
Lisboa
Guarda
Overview map
Units
French Population: 440000 Turn: 259 Gold: 2183 (+74) Tax: 80 Lux: 20 Sci: 0

IoT in Infrastructure

From Dedicated Scanners and Readers to Ambient Networking

Snap Shots

Optical Scanner

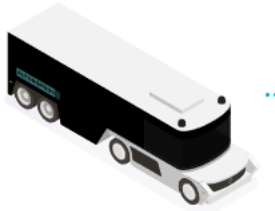
RFID gate

Ambient network

Continuous

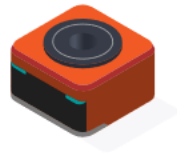
Sensor embedded directly in cardboard at productions

Auto-association at supplier



Smart vehicles track in transit

Seamless read at DC by robotic forklifts



Intra-DC tracking via robots

Passive reads via associate devices

Last Mile tracking via vehicles

Delivery Confirmation Door Rings and home automation

Box open detection

Signals sent to cloud via smart speaker

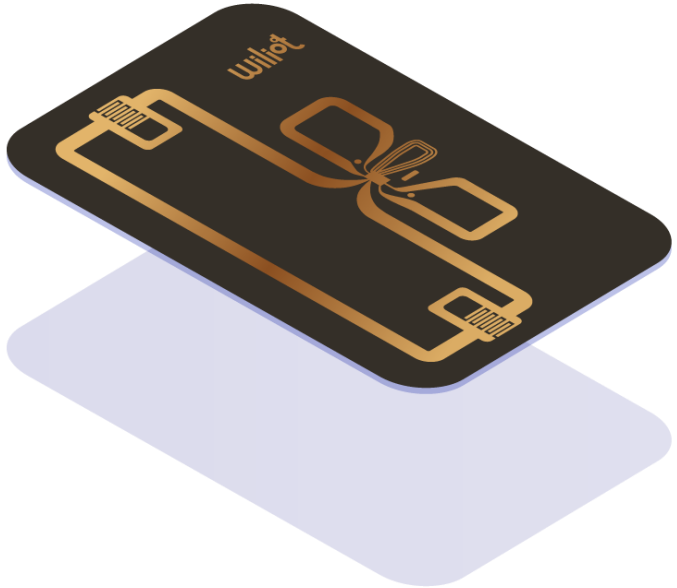
If tagged at item level: full empty detection Via domestic vacuum robot

IoT Pixels Details

SIZE
2.4 × 4.4 cm

COST
5.5c IC

RANGE
10–15+ meters



POWER
Battery Free.
Harvests sub 1 GHz and 2.4 GHz RF

COMMUNICATION
BLE 2.4 GHz

DATA
Identification, Temperature, Humidity

SECURITY
AES-128, end-to-end encryption
and authentication

Wiliot – A Leader in Ambient IoT

Our approach to IoT is to make things smart — any location and with negligible infrastructure investment

200+ Employees Globally

Active projects with **2** of the **Fortune 5** Companies

First **Bluetooth Qualified** & **FCC Certified** Battery Free Tag

+70 million tags in 2023

Over **50** **Patents**

Offices in:

Australia
Israel
Portugal
Taiwan
USA
UK
Ukraine

Founded in **2017**

Over **$270m** total funding

SoftBank
PEPSICO
amazon
Vintage Investment Partners
Qualcomm
83NORTH
NTT docomo NTT DOCOMO Ventures, Inc.
SAMSUNG
AVERY DENNISON
MAERSK GROWTH
NORWEST VENTURE PARTNERS
M VENTURES
verizon
GROVE VENTURES
Alibaba.com

Ambient IoT Recognition

Real-time Visibility

NRF National Retail Federation

WINNER
Best Distribution Center Innovation
★★★★★
2024
VENDORS IN PARTNERSHIP

wiliot

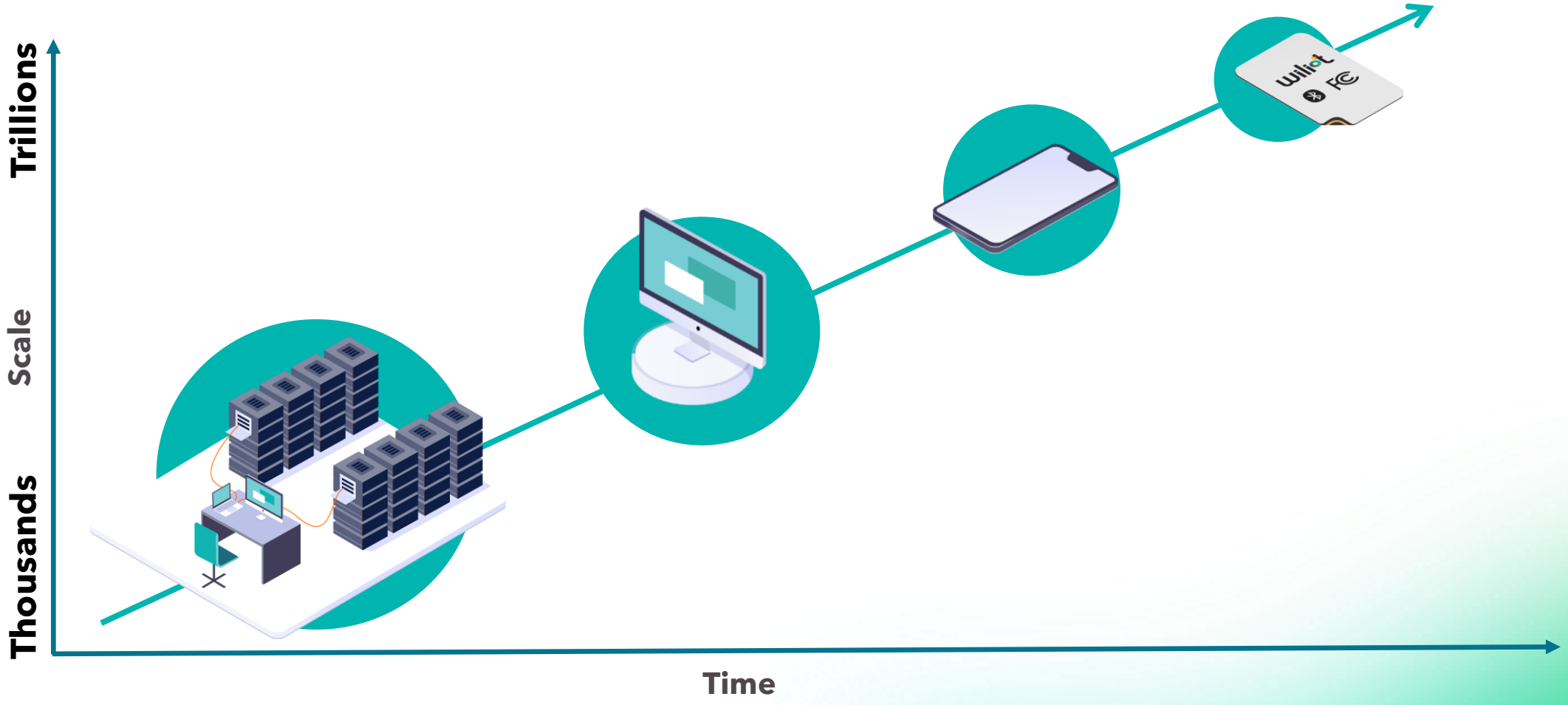
FAST COMPANY

Next Big Things In Tech /2023

EXCELLENCE IN INNOVATION | WILIOT

From Mainframes to Stickers

Connectivity and computing commoditized



The Wiliot Solution

Architecture

Ambient IoT – An Inflection Point

To know where we are going, let's begin with where it started

	RFID Gen 2	Ambient IoT RFID Gen 3
Cloud Native	✗	✓
Real-time Actionable Insights	✗	✓
Sensing	✗	✓
Secure	✗	✓
Existing Infrastructure	✗	✓

Ambient IoT

Ambient (Merriam Webster)

ambient adjective

am·bi·ent | \ ˈam-bē-ənt

Existing or present on all sides : **ENCOMPASSING**

Ambient IoT

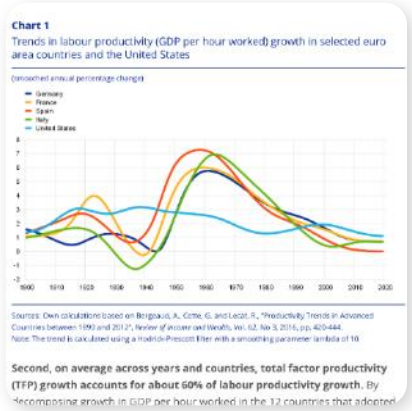
- In food, medicine, clothing, furniture, wallpaper…
- Read by the devices that are everywhere & part of every “thing”
- Communicate continuously without human intervention

Ambient Power

- Battery-free, energy harvesting
- Harvesting energy from radio waves
  - Small, no line of sight required, no maintenance, lowest cost

Ambient IoT addresses our biggest challenges

Productivity



Supply Chain

Climate

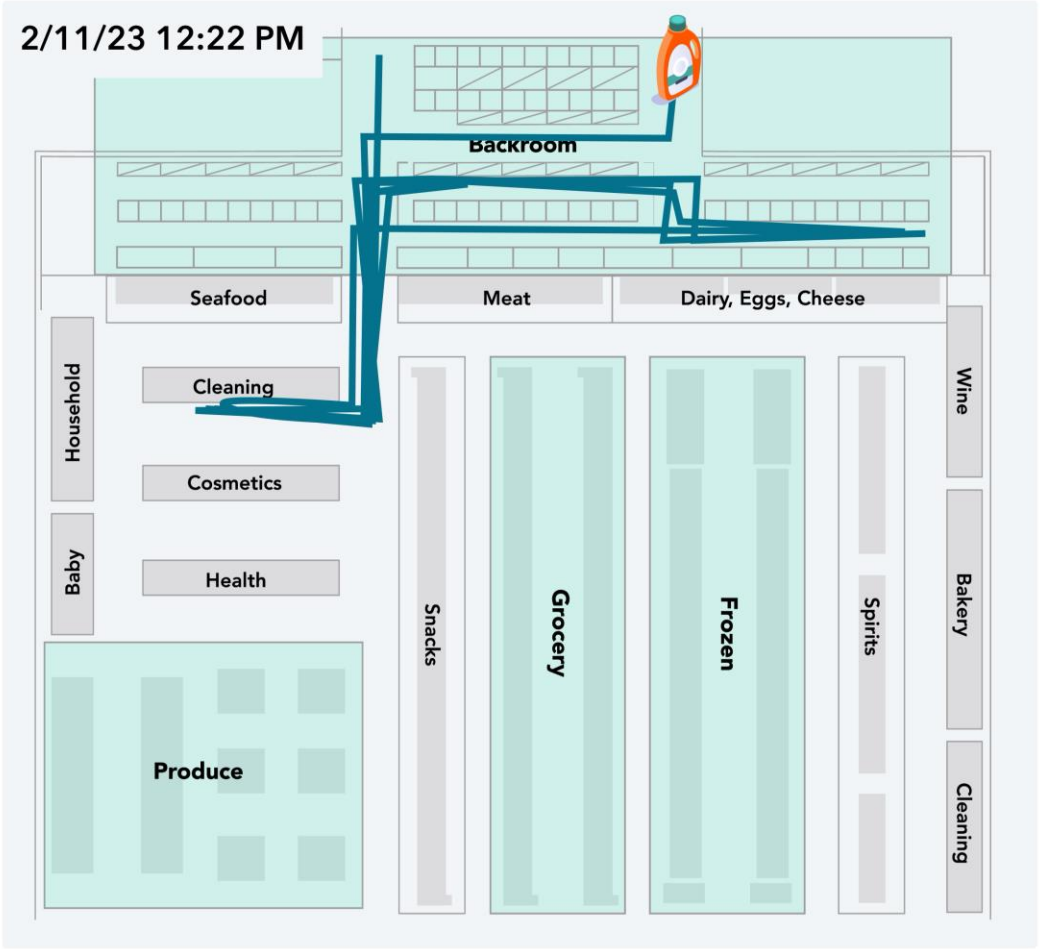
Crime

1 - European Central Bank Bulletin 7/2021
2 - A shelf near you
3 - San Diego Regional Disaster Fund – San Diego Foundation

Real-time Visibility

The future of retail is real-time inventory in stores

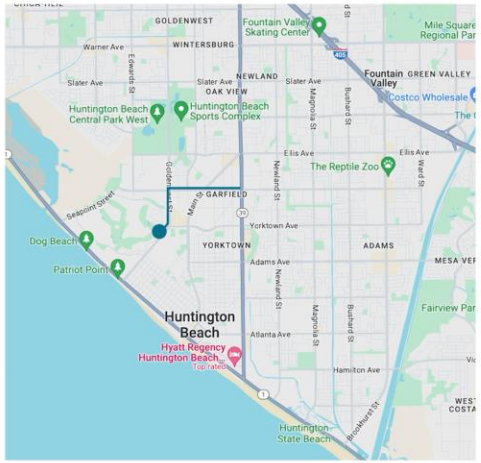
- Merchandising Compliance
- Planogram Compliance
- Out of stock alerts
- Time to replenish
- Employee satisfaction and efficiency

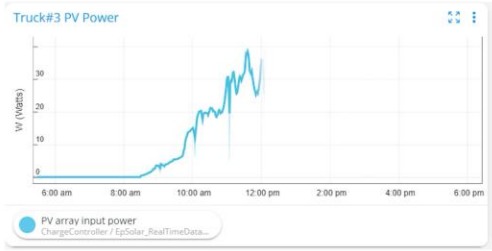


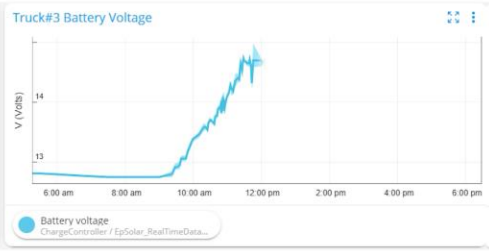
... Improved customer experience

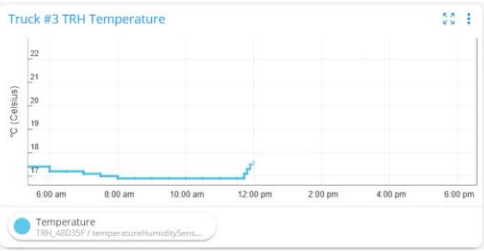
Real-time Item-in-Transit Visibility

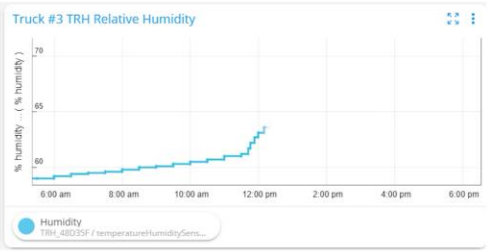
Live Demo











Living Web a Browser for the Physical World

Hear, Sense, See, Remember

- Browse places and things around you
- No type – No tap – No scan
- The Digital Product Passport for everything visible
- Open sourced
- Web standards-based

MARKET RESEARCH NOTE

The Ambient IoT: The Emergence of a New Class of Bluetooth® IoT Devices

Bluetooth® | ABIresearch

Key Statistics for Ambient IoT Markets

Supply Chain

- **5.6 Trillion** food items manufactured in 2023
- **19.9 Billion** pharmaceutical items manufactured in 2023
- **15.4 Billion** unit load formation assets in circulation in 2023

Commercial Buildings

- **US $10.1 Billion** spent on commercial building automation hardware in 2023
- **3,644,000** service sector establishments in the US
- **1,787,000** retail and hospitality establishments in the U.S.

Industrial and Energy

- **818 Million** industrial machines and pieces of electrical equipment installed in 2023
- **287,500** manufacturing facilities in the US

Consumer

- **US $31.5 Billion** spent on smart home hardware in 2023

Figure 3: Ambient IoT Opportunities and Key Market Statistics (Source: ABI Research)

3GPP 5G Advanced Release 19

Why? - It's the Network

- QoS and Support
- $Billion Marketing
- Networking
  - Any brand, any product, any where
  - Without Apple, Amazon or Google

Passive and active approaches likely

Peter Finch

Metro-Gold

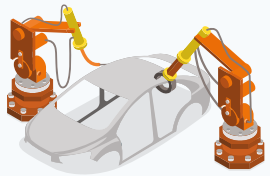
3GPP Ambient IoT

- Use cases established
- 3GPP Rel19
  to be first release to include the ambient IoT
- Active and Passive Options
- Wiliot has Proven the Active Option

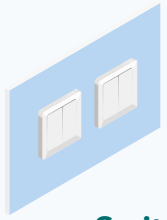
Asset tracking

Agriculture monitoring

Indoor positioning

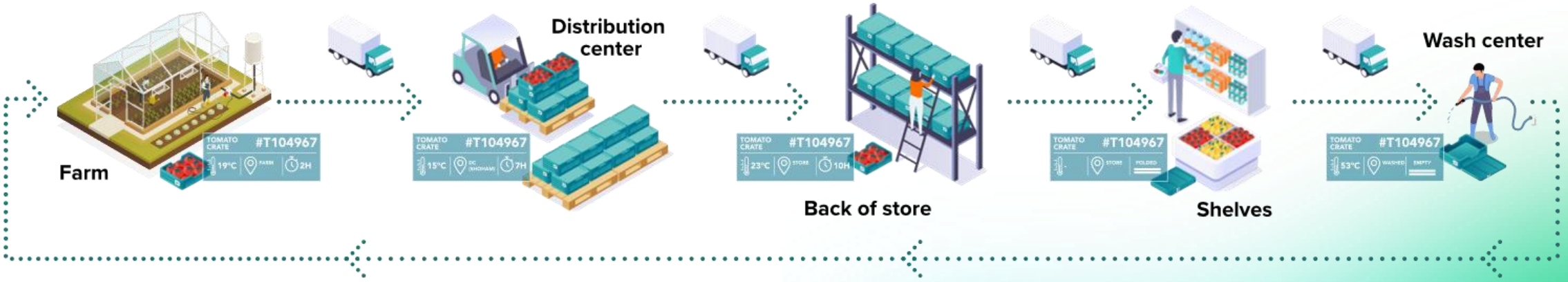


Auto-manufacturing

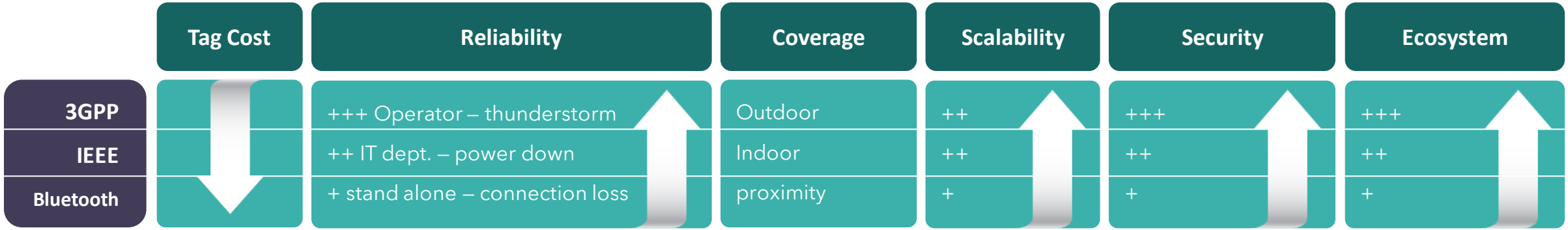


Switches

Example Supply Chain Use Case: Fresh Food



Ambient IoT – Standards Direction



3GPP A GLOBAL INITIATIVE

SA1 requirements (22.840)

RAN-work scoping started

Rel19
(Ambient IoT service)
~2025—2026

IEEE 802.11™

AMP-TIG formed

802.11 AMP Task Group
(Ambient Power)
~2027

Wave Computing

RF waves carry energy

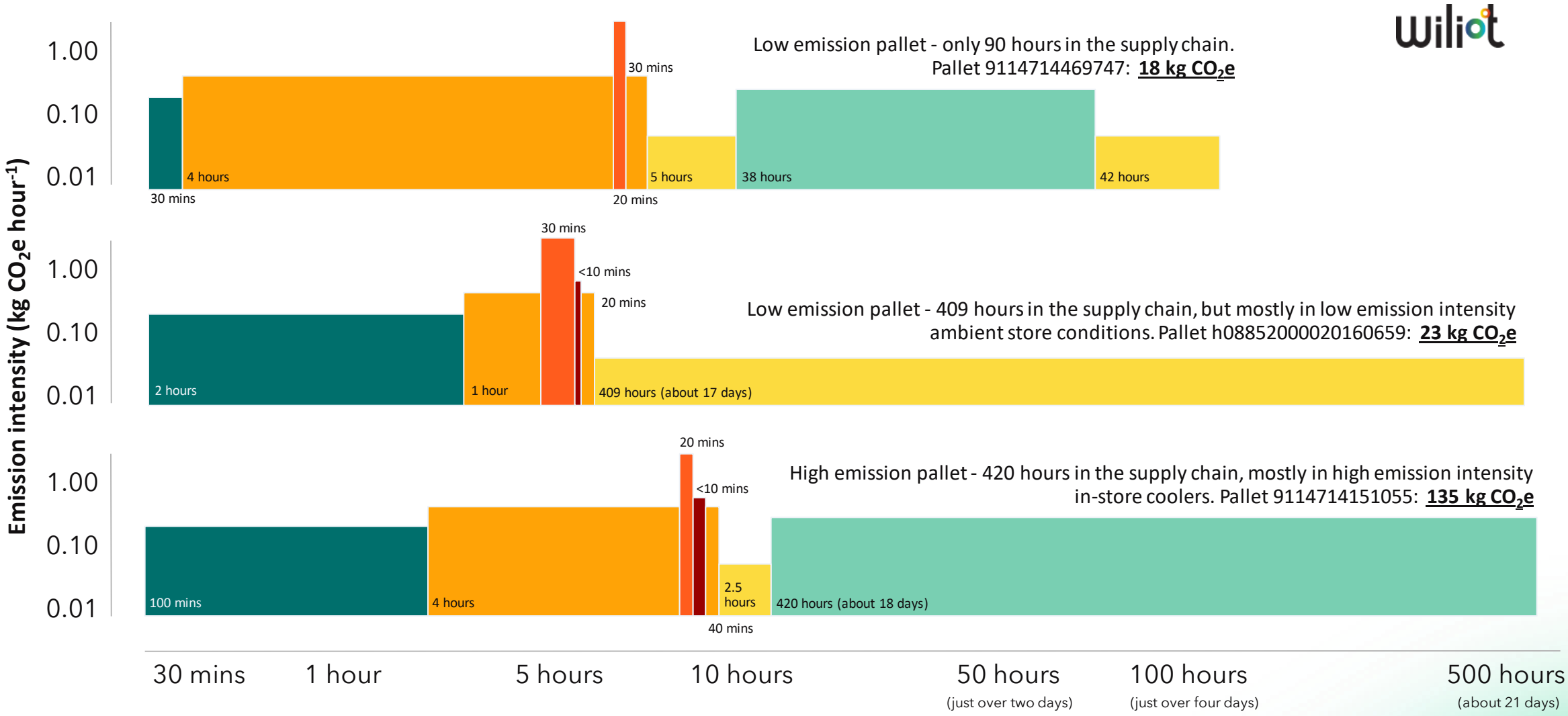
Tag Antenna collects the energy

Tag chip converts from RF power to DC and stores it

Energy balance to sense, compute, authenticate

Bluetooth transmission

Carbon visibility real-time across supply chain


Emission intensity (kg CO_2e $hour^{-1}$)
1.00
0.10
0.01
Low emission pallet - only 90 hours in the supply chain.
Pallet 9114714469747: 18 kg CO_2e
30 mins
4 hours
30 mins
5 hours
38 hours
42 hours
30 mins
20 mins
Low emission pallet - 409 hours in the supply chain, but mostly in low emission intensity ambient store conditions. Pallet h08852000020160659: 23 kg CO_2e
30 mins
<10 mins
20 mins
2 hours
1 hour
409 hours (about 17 days)
High emission pallet - 420 hours in the supply chain, mostly in high emission intensity in-store coolers. Pallet 9114714151055: 135 kg CO_2e
20 mins
<10 mins
100 mins
4 hours
2.5 hours
420 hours (about 18 days)
40 mins
30 mins
1 hour
5 hours
10 hours
50 hours
(just over two days)
100 hours
(just over four days)
500 hours
(about 21 days)
Time spent in supply chain
DC
Parking lot (reefer)
Transit
Transit (congestion)
Store (ambient)
Store (cooler)

Help Planet, Profit & People

Carbon = Cost

Implications

Good News For All – Action Required

Carriers

Device & Infrastructure Vendors

Consultants

Enterprises

Consumers

	Carriers	Device & Infrastructure Vendors	Consultants	Enterprises	Consumers
Strengths	Open Access for CPGs and Retailers	Scale New Product Introduction	Strategy, SI, Dev Capacity	Resources Incumbency	Power of the Purse
Weakness	New Paradigm – Pricing, Services, Solutions	Innovators Dilemma	Experience with the New Paradigm / Serialization	Gap in skills and systems required	Understanding and Choosing Offerings
Opportunities	Massive Value & Recurring Revenue	Massive New Categories of Systems	Helping a World Changing Transform	Demand Chain, Efficiencies, XaaS	The Power of Visibility
Threats	IoT Networks	New Entrants	New Entrants	New Entrants	Data Ownership
Action	New BU Prepare Using Existing BLE Standards	Pre-standard devices Learn in existing BLE market	New BU Develop Competency	New BU Bring in New Skills Enterprise Architecture Plan	Demand Transparency Demand Data Protection

Thank You

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