



Sensors
Converge

Charging the Future of IoT

Cesar Johnston, Energous

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#SensorsConverge

Forward Looking Statements

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The background of the image is a dark blue color with a faint, glowing circuit board pattern. The pattern consists of various lines, nodes, and circular shapes, resembling a complex network or a microchip layout. The text is centered in the upper half of the image.

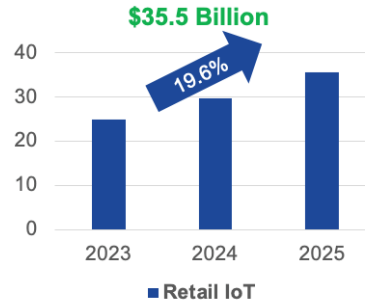
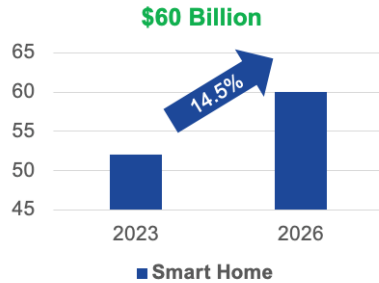
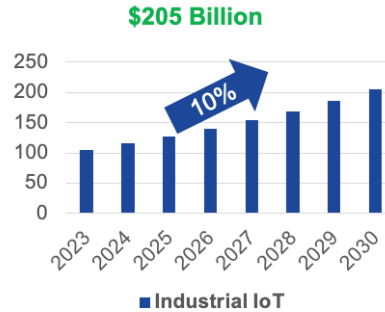
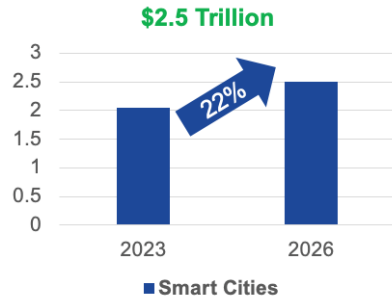
Unleashing The Full Potential Of IoT Through Wireless Power Networks



Agenda

- IoT Market Trend
- Current and Future Deployment challenges
- Wireless Power Network Solutions
- Product Safety
- Design and Deployment Considerations
- Energeous at a glance
- Q&A

IoT Ecosystem is Rapidly Expanding



12B IoT DEVICES 2021







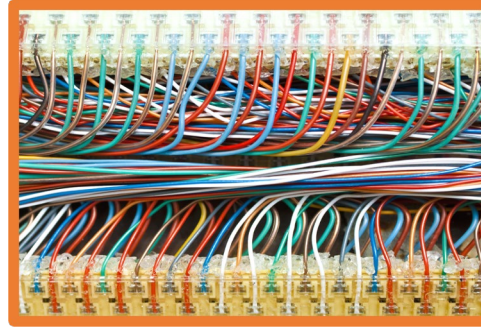
**Massive Amounts of Data
Being Generated as IoT
Device Deployments are
Rapidly Increasing.**

Current & Future IoT Deployment Challenges








BATTERIES

-  Capacity limits new features
-  Toxic waste/landfill issues
-  Labor intensive and cost prohibitive servicing
-  Limited usage in challenging environments and access







WIRES/CABLES

-  Limited or no mobility/flexibility
-  High installation cost
-  Location limitation
-  Limited movement
-  Extended downtime



DATA OVERLOAD

-  Data overload
-  Limits usable devices
-  Maintenance cost
-  Reduced communications efficiency

Wireless Power Network - Enable a New World for IoT

Cost reduction:
Disposable battery removal
Cost of service

Certified worldwide
for safe operation

Unlimited distance coverage
while increasing data
communications efficiency



Enables sustainable IoT
with device mobility

Unleashing higher
levels of power with
increased edge device
functionalities including
AI

IoT Deployments Tomorrow

Wi-Fi



Wi-Fi



Cloud

Powers an Unlimited Amount of IoT Devices



Wireless IOT Devices

Sensing, Tracking, Computing, Communicating, Entertaining... (in all sectors)

Wireless Power From Energoous

WattUp PowerBridge Transmitters

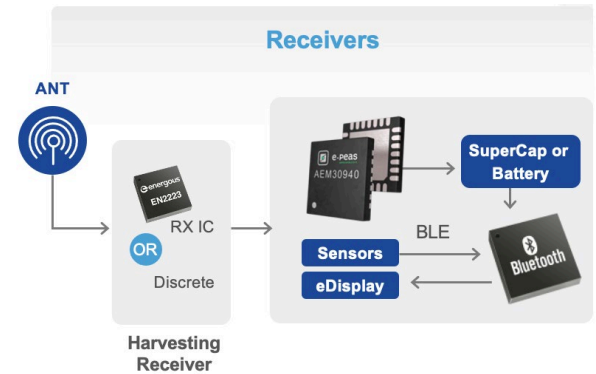
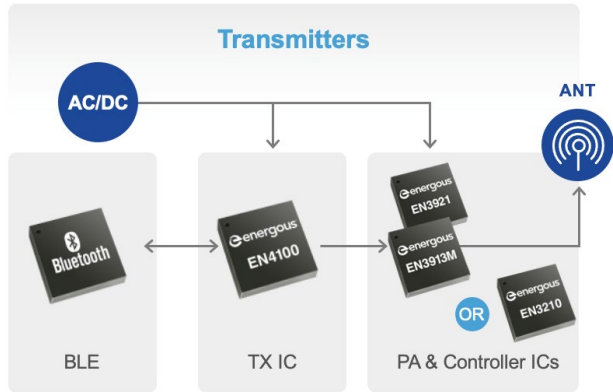
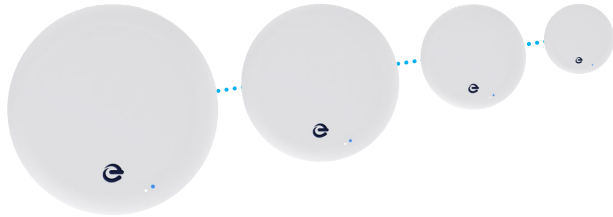


WattUp Devices



- Custom Receiver and Transmitter Silicon, Antennas, and Dedicated Transmitters
- WattUp PowerBridge, WattUp PowerHub solutions create networks of wireless power for any IoT device, sensor, or tag
- Manage IoT device data
- Manage power distribution
- Enable tracking and data centric IoT business models
- Enable Smart Industry, Smart Enterprise, Smart Home, Smart Anything

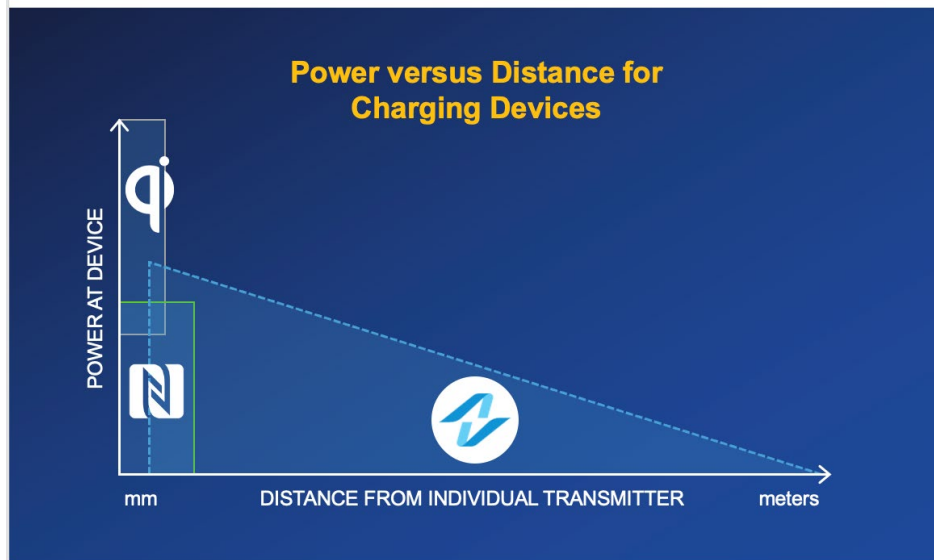
Products & Solutions



900MHz Band – better efficiency, less interference

Interoperability

Energous co-defined the AirFuel standard



The only wireless power standard that covers power at a distance

Enables a large variety of (small) IOT devices over a broad range of power levels and distances

WattUp from Energous is an AirFuel interoperable solution

Regulatory Certified In World's Largest Markets



U.S. & Canada



United Kingdom



European Union



Australia & New Zealand



China



South Korea



India



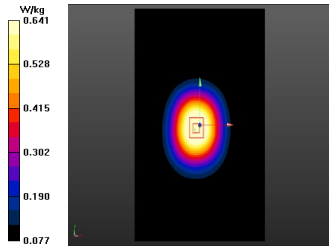
Japan

Prioritizing Product Safety

Low SAR Levels



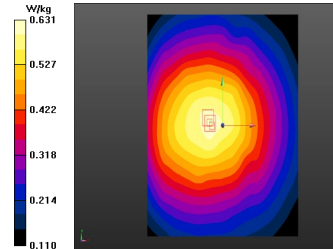
1W PowerBridge



SAR(1g) = 0.608 W/kg at 5cm



5W PowerBridge



SAR(1g) = 0.586 W/kg at 20cm

FCC Limit is 1.6W/kg

All products comply with Intl. RF Safety(SAR) limits



Focus IoT Market Applications



END-TO-END DEVICE TRACKING

RF Tags enabled for real-time charging, tracking and management of products through their entire supply chain

In partnership with



ELECTRONIC SHELF LABELS & DIGITAL INFORMATION DISPLAY

Movable digital displays provide dynamic pricing, alerts, notifications and instructions wherever located

In partnership with



IOT SENSORS

IoT sensors detect, respond and report changes in an environment. Input can come from a variety of sources such as light, temperature, motion, humidity and more

In partnership with



IoT Market Opportunities



Smart Home/Office

- Smoke/Co2 Detectors
- Smart Thermostat
- Home/Office Security
- Window/Door Sensors
- Motion Detectors
- Smart Bathrooms



Discrete Manufacturing

- ESL - Industrial
- Robotics
- Fault Prevention Sensors
- Floor Security
- Work Safety Chemical/
Gas/Water Leak Sensor
- Air Quality/Co2 Monitor
- Warehouse Operation IOT



Retail IoT

- ESL - Retail
- Occupancy Sensors
- Smart Shopping Carts
- Temperature/
Humidity Sensors



Healthcare Provider

- ESL - Healthcare
- Asset Trackers
- Vaccinations/Drugs
Storage Monitor
- Patient Trackers
- Window/Door Sensors

Partner Ecosystem



TECHNOLOGY PARTNERS



SYSTEM INTEGRATORS



DISTRIBUTION PARTNERS



Award-Winning Technology



Golden Bridge Awards:
Gold Winner in
Technology - Wireless



CES Honoree:
Embedded Technology
Eco-Design
Smart Energy



2021

2022

2023

2020

2022

Global Technology
Innovation Award
by Frost & Sullivan



IOT Breakthrough Award:
Partnership with e-peas



CES Honoree:
Embedded Technology

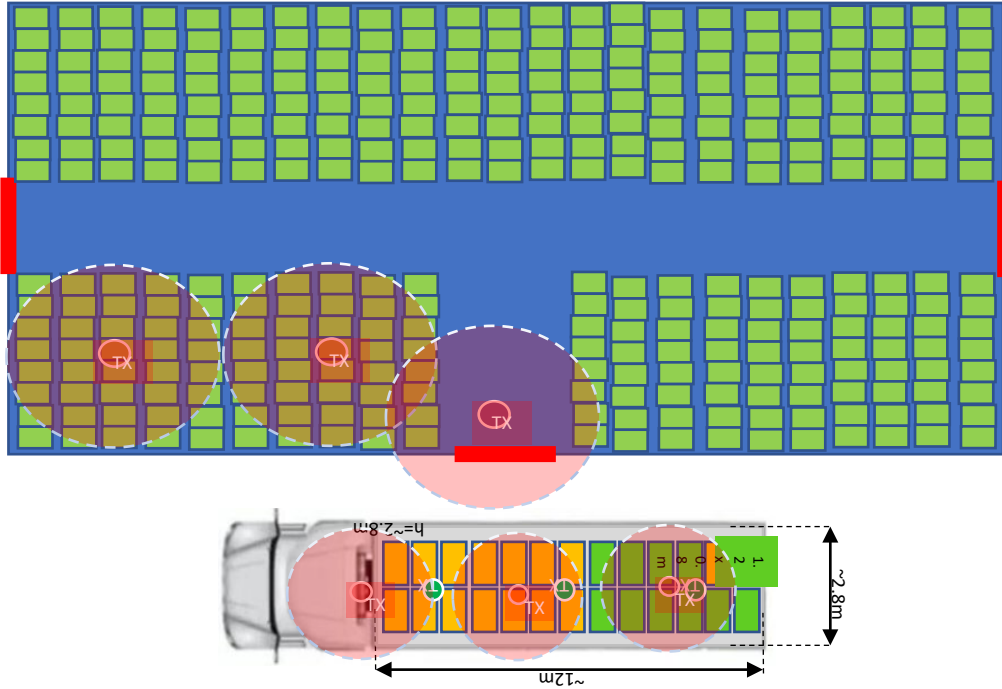
Logistics Application Example



Requirements

- Tracking assets at 250 sq meter
- 60 pallets should be tracked
- In/out dock door detection

Logistics Application Example



Requirements

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- 60 pallets should be tracked
- In/out dock door detection

Solution

- ✓ Energos Transmitters
- ✓ 99% read
- ✓ No cable
- ✓ No dock door gate needed
- ✓ Information available on mobile devices

Second Successful Retail Deployment

A photograph of an Academy Brand store interior. The store has a rustic, industrial feel with exposed wooden beams and pipes on the ceiling. Clothing is displayed on racks and tables. A circular inset in the upper right shows a close-up of a blue polo shirt with a zipper collar. The text "ACADEMY BRAND" is visible on the floor in the lower right.

Thousands of Wiliot Pixel RF-tags in an Academy Brand store energized by multiple 1W WattUp PowerBridge transmitters.

- 2nd Retail Deployment Announced with Flagship**
First deployment was announced on August 1, 2022
- Instant and Automatic Inventory Counts**
Of stores, storerooms and warehouse allowing staff to focus their time on the customer experience.
- Loss prevention insights**
Keep track of inventory and reduce theft and shrinkage.
- Fitting room sessions**
Better understand what items customers are trying on, what sizes and what they ultimately purchase.
- Replenishment requirements**
Get an accurate end of day stock count for each store indicating which items need to be replenished from the stockroom.
- Actionable Merchandising Insights**
Know how customers are engaging with products for ultimate floor merchandising, including items tried on, items tried on together and highest converting items.

IoT Sensing Proof of Concept Deployment - SATO

SATO IoT sensing mat energized by 1W WattUp® PowerBridge transmitter

Out of stock prevention

Helping customers and distributor to have direct access to product inventory

Detection of in-store inventory

Of stores, storerooms and warehouse allowing staff to focus their time on the customer experience.

Measuring promotion campaigns

Understand price promotion effectiveness

Improve operational quality

Ensure product availability

Smart Football Deployment – Catapult

College football energized by WattUp® transmitter

Multiple deployment announced in college football

Boston College and University of Nevada

Real time analytics viewed by coaching staff and broadcast

Localization, speed, and velocity

Football localization

UWB technology to detect ball's exact location

Assess player performance

Sensor technology to assess player performance and readiness



CATAPULT

STADIUM RECEIVERS CAPTURE & COMBINE BALL & ATHLETE DATA

DATA INTENSE CHIP

- 40 Hz LPS Sensor
- 100 Hz Tri-Axial Gyroscope and Magnetometer
- Data Broadcast Live via UWB to the Cloud

Generous WIRELESS CHARGING

- Allows us to integrate our chip without changing the ball characteristics
- Meets our high-power consumption needs
- Provides for easy game day operations

REAL-TIME ANALYTICS VIEWED BY COACHING STAFF & BROADCAST



Thank You