NGIOT WEBINAR

PRESENTATION OF THE NGIOT ROADMAP

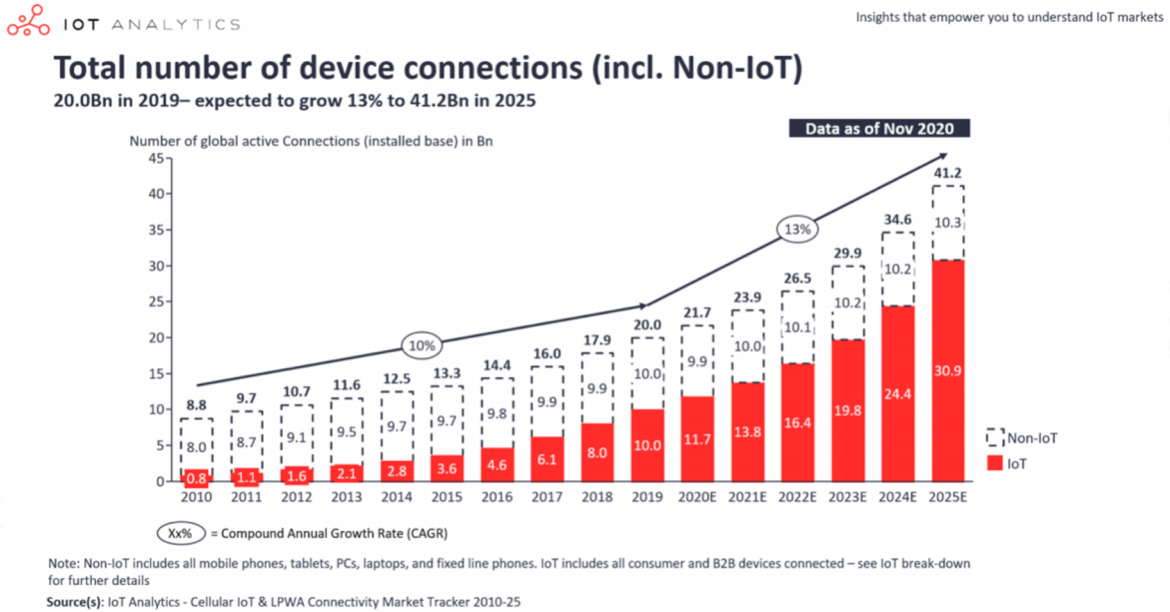
IoT and Edge research, innovation and deployment priorities in the EU

MARKET RESEARCH AND BUSINESS MODELLING

MARKET DIMENSIONS

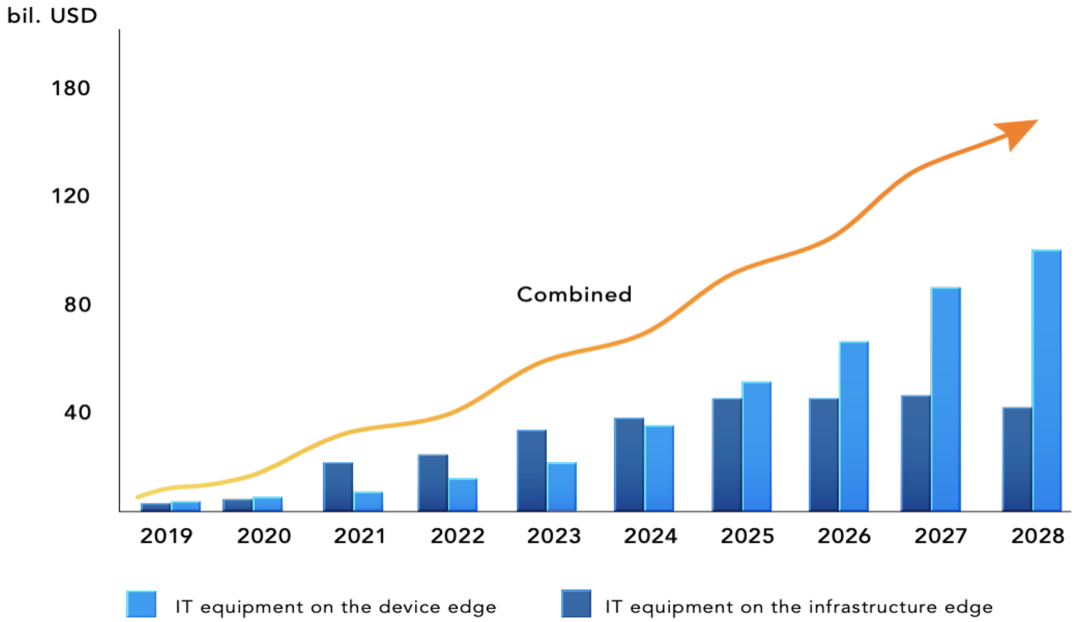
PROJECTIONS FOR IOT AND EDGE

- IoT devices duplicate from 2020 to 2025 at ~15% CAGR
- IoT connections surpassed Non-IoT in 2020
- All projections position APAC, North America and Europe in order of volume.



Number of devices projection [1]

- Operators are leading adoption with cloud providers most likely to provide platform environments in the future
- Europe at 31% of investments by 2028, with multinational network operators in western Europe as largest customers



Regional and Domain Potential [2]
Global annual CAPEX on Edge[3]

1. https://iot-analytics.com/state-of-the-iot-2020-12-billion-iot-connections-surpassing-non-iot-for-the-first-time/
2. https://artemis-ia.eu/news/whitepaper-from-iot-to-sos.html

EDGE COMPUTING LANDSCAPE

European front runners in Edge-IoT

Application / Services

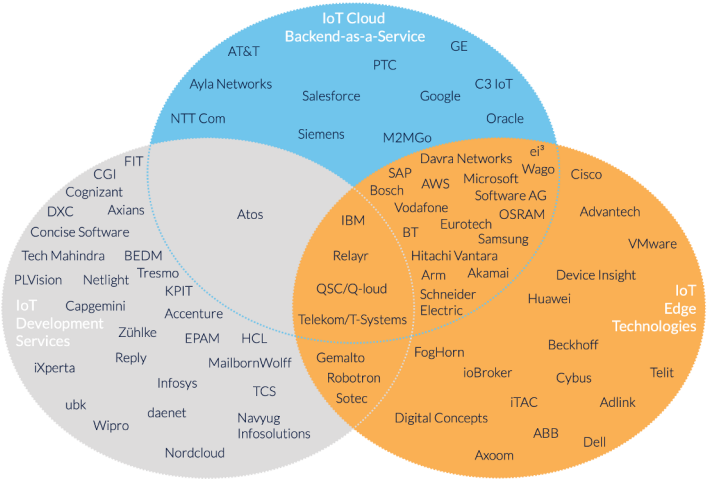
Support services

Devices & Premises

Main Alliances, Fora & Organisations active in Cloud-Edge-IoT

- **Network operators** are front-runners in edge computing investments
- Europe has strong players in **hardware and service providers**.
- Moving **from use cases towards platform-centric** environments leaders are non-european AWS, Microsoft
- Blurring lines between cloud & edge

// Triple-Play Providers



IoT Vendor segmentation[6]

10. https://www.reply.com/Documents/Report_CVU_IoT_licensed_for_Reply.pdf

6. https://www.reply.com/Documents/Report_CVU_IoT_licensed_for_Reply.pdf

7. http://mattturck.com/wp-content/uploads/2016/03/Internet-of-Things-2016.png

NGIOT KEY PRIORITIES

(Domain)

Domain Specific Priorities - SCC

- **Current state, trends & opportunities**

  Edge as post cloud, personalized solutions for citizens

  Edge moving towards predictive/real time traffic optimization by enhanced connectivity of users, assets, vehicles and infrastructures

  European ambition to deploy “10,000 climate- neutral and secure edge nodes” across the EU, open and distributed in a way (Digital Decade)

- **Priorities & Actions**

  Embedding edge in cloud strategies

  Shift to edge computing as pathway to the green digital transformation of cities and communities

  Partnerships across demand and supply (EIP-SCC)

  Open source adoption

- **Challenges & Barriers**

  Trust (by end-users)
  Security and privacy
  Lack of interoperability • V endor lock-in
  Scalability
  Inclusiveness

- **Key Organisations**

  OASC
  EUROCITIES
  ENoLL
  Artemis Industry Association • EPOMM
  ELTIS
  UTA
  IoT Forum
  Fiware

  Relevant Movements: Living-in.eu

  Relevant H2020 Projects: AURORAL, dRural

Domain Specific Priorities - Agrifood

- **Current state, trends & opportunities**

  Including an inclusive approach to realise new scenarios from farm to fork.

  Difficult deployment despite market demand

  Acquired data to be transformed into knowledge that will facilitate control of farming activities (e.g. health control, feeding, growth)

  Enablement an autonomous control of processes and activities along the agri-food chain.

- **Priorities & Actions**

  Support digital innovation & experimentation, to a integrate Edge IoT from farm to fork sustainably

  Create trust and change culture (demand side)

  Transformation for inclusive, partnership approach, experiences of other sectors like smart cities and communities (including rural development), logistics, meteorological services and retail.

- **Challenges & Barriers**
  - Widespread connectivity
  - Trust (by demand and producers)
  - Security and privacy
  - Mindset and culture
  - Battery lifetime
  - High upfront cost, and long payback, low profit margin
  - Fragmentation
  - Accuracy of sensors

- **Key Organisations**
  - CEMA
  - ECPA
  - CELCAA
  - COCERAL
  - COPA-COGECA
  - EFFAB
  - Euroseeds
  - FEFAC
  - EIP-Agri
  - AEF

Relevant H2020 Projects:
- Smart Agrihubs
- IoF2020
- AGRICORE
- DEMETER

Domain Specific Priorities - Energy

- **Current state, trends & opportunities**

  Energy is a critical infrastructure.

  Key sector to progress towards the green transition.

  Currently, enabling SCADA systems to the Cloud.

  Most of the logic still sits within large controllers, now supported by some further intelligence in the Cloud.

- **Priorities & Actions**

  Sustainability: Integrating renewable energy sources using AI, IoT, Edge, Cloud, for flexibility, reliability and CO2 emissions reduction

  Cloud-Edge and 5G architectures to offload intensive compute operations services like transactive energy and integration of the grid

  Blockchain powered energy networks

  New partnerships, open source adoption and SME collaboration for faster development cycle, increased resiliency and local data keepers

- **Challenges & Barriers**

  Scalability (harmonised across Member States)
  Interoperability
  Security and confidentiality
  Reliability

- **Key Organisations**

  EERA
  ERA-Net SES
  EURAC
  COGEN-Europe
  European energy forum
  AIoTI

  Relevant H2020 Projects:

  StoRIES

NGIOT KEY PRIORITIES

(Economic – R&D&I and emerging tech)

Economic & Policy Priorities

- **E1. Support for SMEs and start-ups**

  Capital barriers vs. Strong Brands, Lack of VCs

- **E2. Data as critical assets**

  Clarifying data ownership

- **E3. Increase digital skills and competencies**

  Especially true for rural areas and farming industry

  Close the gap between possibility and market availability

- **E4. Build Trust**

  Trust among current and potential IoT users, policy makers and citizens. Lack of business cases for trust

- **E5. Identification of Key Regulatory and Legal Issues**

  Regulation at the right time. Law complexity across countries

- **E6. Interoperability and Replicability**

  Minimal Interoperability Mechanisms (MIMs)

- **E7. Innovation Procurement**

  Dependency on non EU cloud provider

- **E6. Sovereignty**

  Align public procurement with the dynamics of IoT

R&D&I Priorities

IoT

- **R1- IoT: Autonomous IoT solutions**

  Large IoT & digital infrastructures, Autonomous IoT infrastructures

- **R2-IoT: Human & sustainable developments in the loop IoT**

  Sustainable IoT by design, Augmented IoT, Tactile Internet, IoT for sustainability

5G-6G Networks

- **R-NET1: Reliable, low-cost, sustainable and scalable IoT networks**

  Low-cost, high-volume connectivity, Low-power connectivity schemes

Data Management, AI & ML

- **R-DATA1:** IoT data processing architectures
- **R-DATA2:** Decentralised machine learning
- **R-DATA3:** Trusted and effective decisions for IoT
- **R-DATA4:** Processes and data interoperability
- **R-DATA5:** Monetisation models & technologies

Cloud Architectures

- **R-CLOUD1:** Self-* for edge computing
- **R-CLOUD2:** Collaborative orchestration
- **R-CLOUD3:** Energy aware cloud-to-edge infrastructures

Advanced Electronics

- **R-ELET1:** Sustainable and biocompatible devices
- **R-ELET2:** High performance computing devices for the edge

Cybersecurity

- **R-SEC1:** Futureproof security and trust
- **R-SEC2:** Privacy-by-design

NGIOT KEY RECOMENDATIONS

RECOMENDATIONS

- **Recommendations for the Horizon Europe programme**
  - Data Value, IoT Networks, Foster cost-efficiency of solutions, Data Management, IoT / Edge Operating Systems, IoT integration with other technologies, Machine-human interaction, IoT Trials, Research future-proof security and privacy by design, Green and sustainable IoT, IPR protection and patent promotion, Project impact promotion and assessment. Cascade Funding
- **Recommendations for the Horizon Europe programme**
  - Secure and Ethical IoT, Data models for interoperability and replicability, Innovation transfer, Scalability, Sustainability, Independence and sovereignty, IoT Skills Development, Open Innovation, Cooperation and standardization, Large-scale research infrastructure
- **Recommendations for the Horizon Europe programme**
  - Large band connectivity across digital infrastructures

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