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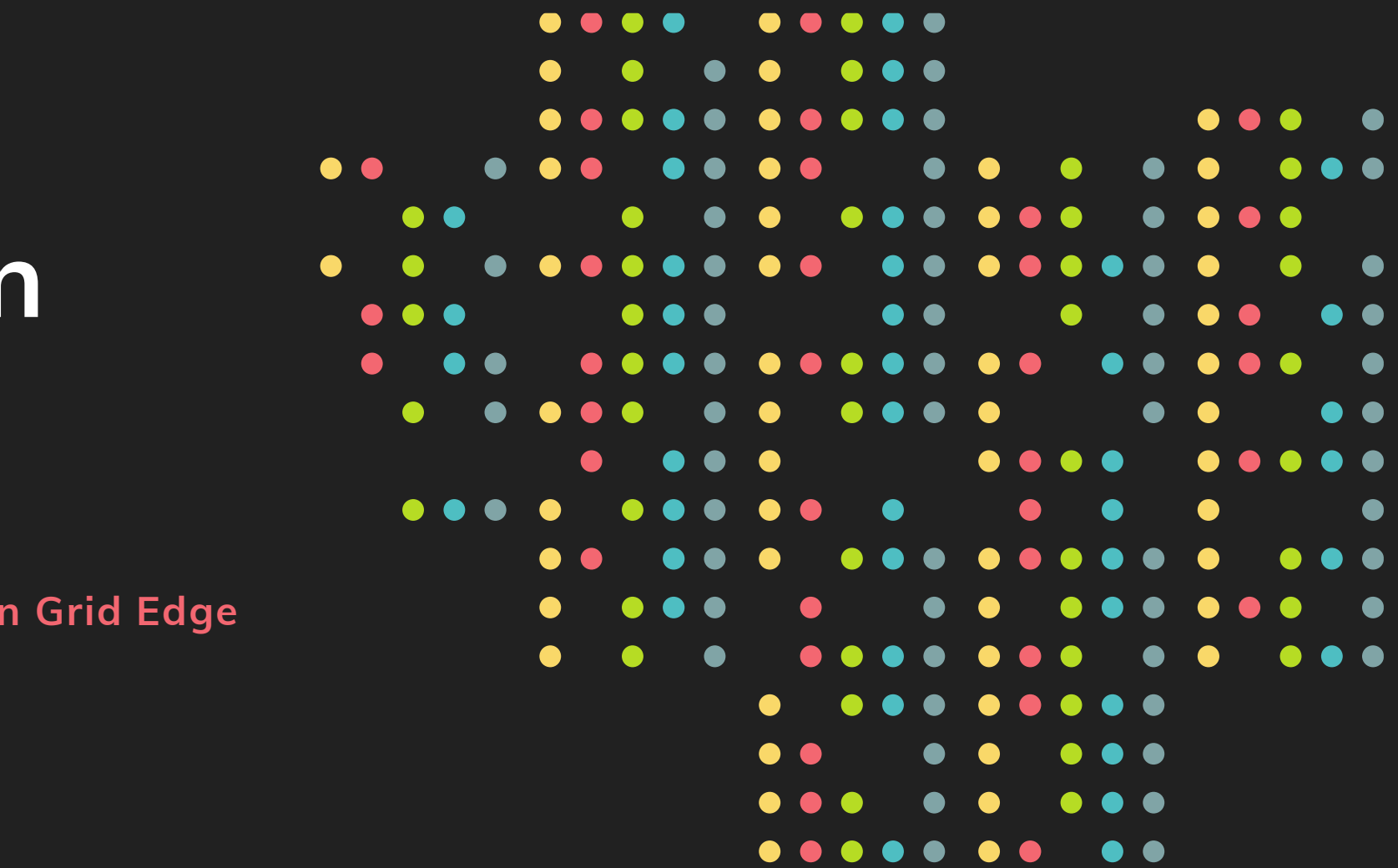
Next Generation IoT

> ENERGY - New concepts in Grid Edge

18th May 2021



AGENDA

1. **NEW**: quick overview
2. **Projects**: highlights
3. **Conclusion**

AGENDA

1 **NEW**: quick overview

2 **Projects**: highlights

3 Conclusion

EDP NEW stands for R&D in energy through international collaboration

Focus on R&D in Energy

- Core focus in the Energy Sector
- Create possibilities for the EDP Group

... towards the energy transition

Sustainable growing operation

- Financial sustainability
- Sustainable growth
- 32 Researchers as of today

The H2020 Company

- #1 Company in Portugal in projects in H2020
- Activity in EU R&D scene
- “Place to go” for H2020, Green Deal, Horizon EU, etc.

Knowledge consolidation & transfer

- Knowledge teams
- Catalyst for technical experts for EDP
- Knowledge exchange initiatives with EDP/community

Foster strategic partnerships

- R&D cooperation with EDP/CTG Business Units (BUs)
- External Innovation Ecosystem including Universities, R&D, Industry, Technology, etc.

A close connection with EDP Labelec enhances cutting-edge testing facilities for future energy systems

EDP Labelec

- State-of-the-art testing & laboratory facilities covering electrical, chemical & environmental areas
- Provision of laboratorial & consultancy services (e.g. grid studies, smart metering testing & validation)
- New grid integration facility: SmartLab as a testing hub for technology demonstration & validation (e.g. microgrids, smart grid technologies, battery technologies, PV systems, EV charging)

Vision

Create multiple technology testing hubs for EDP in collaboration between EDP Labelec and EDP NEW

EDP NEW is organized in 5 knowledge areas each representing a crucial future innovation pillar for the EDP Group

INNOVATION BRINGS A NEW TOMORROW

Smart Energy Systems

- Smart Energy Grids and microgrids
- Grids Services/ grid storage/ V2G/ DR
- Transactive grids
- Interoperability
- Sustainable systems and circular economy

Positive Energy Communities

- Smart Cities
- Smart Buildings
- Mobility
- Energy Efficiency
- Communities & P2P

RES Technology

- On- / Offshore Wind
- Ocean Energy
- PV / Floating PV
- Innovative RES O&M

RES Integration & Flexibility

- Flexibility
- Energy Markets
- Virtual Power Plants
- Battery Storage Technologies
- Green Hydrogen

Digital Energy

- Big Data & Analytics
- AI / Machine Learning
- Cybersecurity
- IoT, Cloud / Fog, Edge Computing
- 5G and ICT

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Our portfolio now has 31 R&D Projects either starting, ongoing or concluded, of which 27 are funded through H2020

Interoperable Smart Energy Grids

Positive Energy Communities

RES Technology

RES Integration & Flexibility

Digital Energy

Projects:

Ongoing

- dominoes smart distribution grid
- interconnect
- eneuron

Conduded

- integrid bridging the gap
- UP GRID

Projects:

Ongoing

- POCITYF
- ambience
- SHARINGCITIES
- SPARCS
- SATO
- SMART 2 B

Projects:

Ongoing

- PivotBuoy
- atlantis
- DTOcean+
- DURABLE
- SeaTitan
- ATLANTIC INITIATIVE OFFSHORE WIND
- FRESHER

Conduded

- BestRES
- SMARES
- DEMOGRAVI3

Projects:

Ongoing

- EU-SysFlex
- XFLEX
- BeHyond
- flexnconfu
- IANOS
- CURRENT DIRECT
- LOLABAT

Conduded

- SENSIBLE

Projects:

Ongoing

- GaaS
- Smart4RES

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eNeuron – project overview

eneuron
optimising local energy communities

OBJECTIVES

Develop innovative tools for the optimal design and operation of LECs integrating DER and multiple energy carriers at different scales which will benefit:

- Local distributed producers and consumers: reduction of energy costs while leveraging local, low carbon energy.
- Developers and solution providers: new opportunities for technologies as part of an integrated, replicable operational business model.
- DSOs: benefit from avoiding grid congestion and deferring network investments.

KEY FACTS

- Start: November 2020
- Duration: 4 years
- Overall budget: 6.3 M€
- EDP budget: 669 k€
- Key partners: ENEA (coordinator), EDP Labelec/ NEW, EDPC and SEL, Ministério da Defesa Nacional, Tecnalia, Sintef, ENEIDA

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eNeuron – what's in it for EDP

PT Pilot: Lisbon's Naval Base Energy Hub

- Military facility with its own distribution grid
- Substation powers two different networks, a 6kV / 50Hz network, comprising residential and industrial loads and a 6kV / 60Hz network, comprising the docks and the battleships.
- Available loads: lighting circuits, HVAC systems, boilers, and industrial appliances (e.g., ovens.
- DER: ship's diesel generators and batteries, PV systems in parking and buildings' rooftops and a EV charging station.

EDP's role

- EDP will be focused on the management of the technical development and implementation of the Portuguese pilot, in Lisbon's Naval Base.
- EDP will be involved in the solution specification and for the pilots' requirements definition.
- EDP will give contributions throughout the project, namely in the development of the concept as well as business models and the economic evaluation, exploitation and replication.

KEY OUTPUTS

- Framework analysis of integrated local multi-vector energy systems
- Use cases and business model of integrated local multi-vector energy systems and the replication plan
- Optimisation of Energy Hubs
- eNeuron Digital Tools

eneuron
optimising local energy communities

Interconnect – project overview

interconnect

OBJECTIVES

InterConnect envisages to contribute for democratization of efficient energy management, through a flexible and interoperable ecosystem where demand side flexibility can be soundly integrated with effective benefits to end-users

It will also validate the use of flexibility platforms and the data exchange interfaces within the DSO infrastructure and demonstrate the compliance with CIM standards and potential for wide adoption at the EU level.

KEY FACTS

- Start: October 2019
- Duration: 4 years
- Overall budget: 35.8 M€
- EDP budget: 900 k€
- Key partners: INESC TEC (coordinator), EDP Labelec/ NEW, E-Redes former EDP Distribuição, SONAE MC, domotica, sensinov, Scheneider

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Interconnect – what's in it for EDP

PT Pilot: Residencial and Comercial

- The residential demo will accomplish the following goals:
- Exploit different energy services (P2P, flexibility management, etc.) for households, buildings, and energy communities.
- Exploit interoperable digital platforms for energy and non-energy services based on cloud and hybrid connectivity solutions.
- Validate and flexibility platforms and the data exchange interfaces within the DSO (Distribution System Operator) infrastructure and demonstrate the compliance with CIM standards and potential for wide adoption at the EU level.

EDP's role

- E-Redes former EDP Distribuição will lead the demonstration WP, besides usual roles in use case and business models definition and exploitation planning.
- EDP LABELEC as E-Redes 3rd party, will be responsible for project's use case requirements ratification for Portuguese demo; UMI market interface test and implementation support on field; lab. integration tests; installation, commissioning and quality assurance of residential equipment and appliances, connection of E-Redes systems to SONAE's retailer.

KEY OUTPUTS

- HEMS – Home energy management system
- BMS – Building management system
- iEMS-System that integrates the BMS systems from different stores.
- Interoperability layer- set of semantic adapters that enables different systems to communicate.

Interconnect – what's in it for EDP

PT Pilot: Residencial and Comercial

- The commercial demo will take advantage of the interoperable framework developed within the project to:
- Develop an integrated Energy Management System (iEMS) for retail stores.
- Explore the provision of Energy Management services through the iEMS.
- Demonstrate flexibility aggregation for DSF (Demand Side Flexibility) to DSO.
- Demonstrate that convenient Electric Vehicles (EV) charging in private areas can impactfully promote e-mobility.

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KEY OUTPUTS

- HEMS – Home energy management system
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5GaaS – project overview

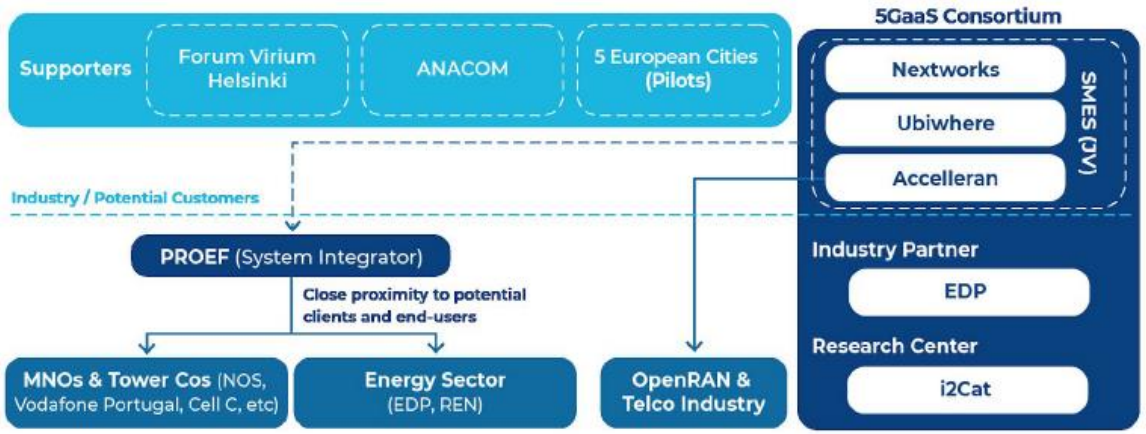
OBJECTIVE

- Demonstration of 5GaaS in at least 5 European cities, targeting a total of 25 sites, by repurposing existing and/or installing new smart and connected urban furniture with built-in telco equipment
- 5GaaS Joint Venture creation
- Acquisition of 5 customers
- 3 new city pilots in the pipeline
- 500 5G sites available on the platform

KEY FACTS

- Start: October 2020
- Duration: 2,5 years
- Overall budget: 3.1 M€
- EDP budget: 500 k€
- Key partners: E-Redes and EDP NEW

5GaaS – what's in it for EDP



EDP's role

- Neutral Host
- Access to part of its infrastructure for demonstration purposes
- Involvement in demonstration and validation activities
- Participation in the development and validation of the platform's business model for all stakeholders

KEY OUTPUTS

- Evaluate the business model of neutral host, comparing to other existing revenues from infrastructure
- Participate in the validation of an innovative marketplace to leverage relations between Site Owners, MNOs, Operators, Integrators, Service Providers, Service and Application Developers
- Validate use of blockchain for secure and automatic economical transactions, according to some pre-established set of rules.

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Conclusion

- The previous Projects are still ongoing and the results are not final
- IoT plays an important role in the smartification of the grid and is a pillar in the energy transition
- The future is Digital, Decentralized and Decarbonized (through electrification)

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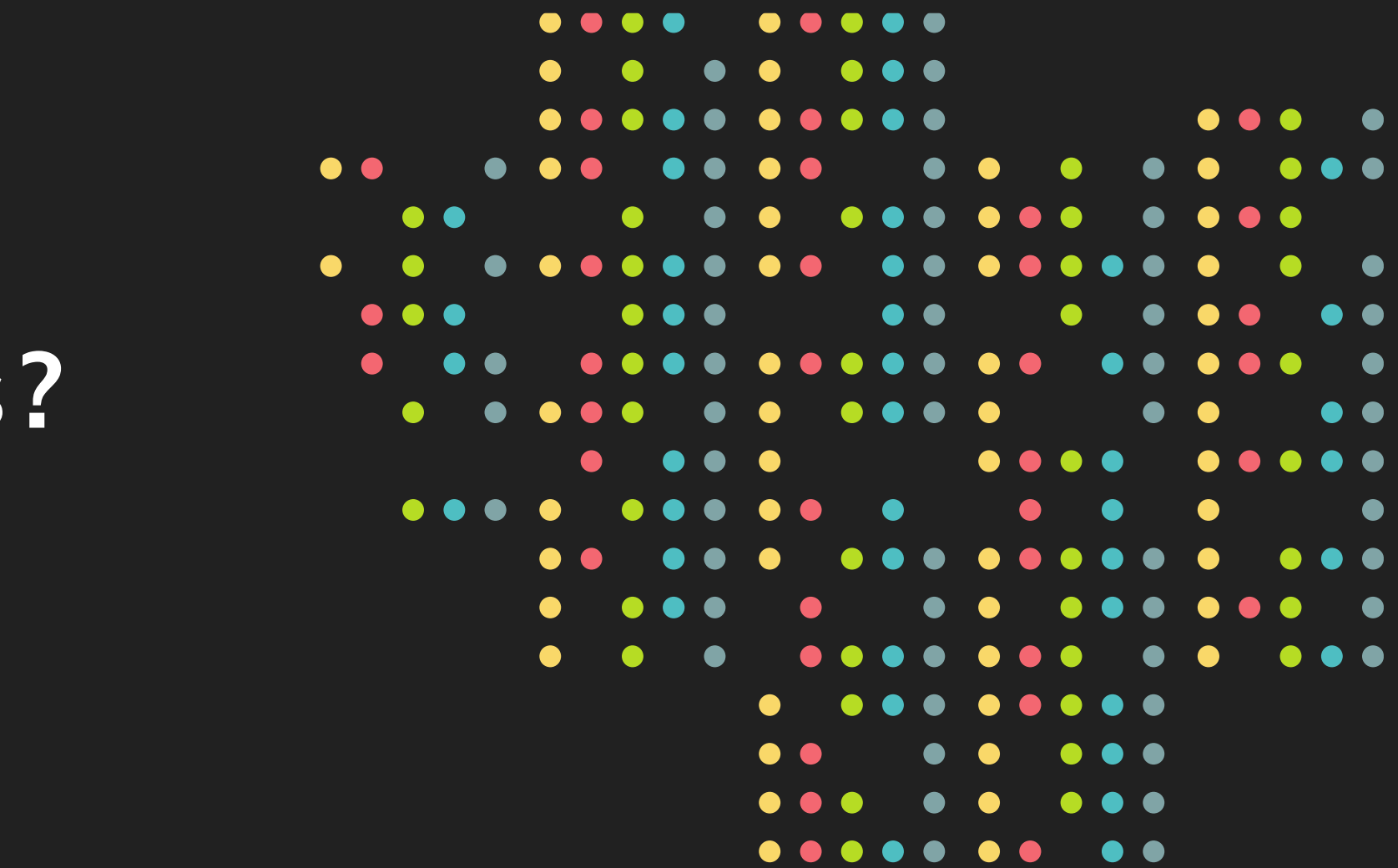
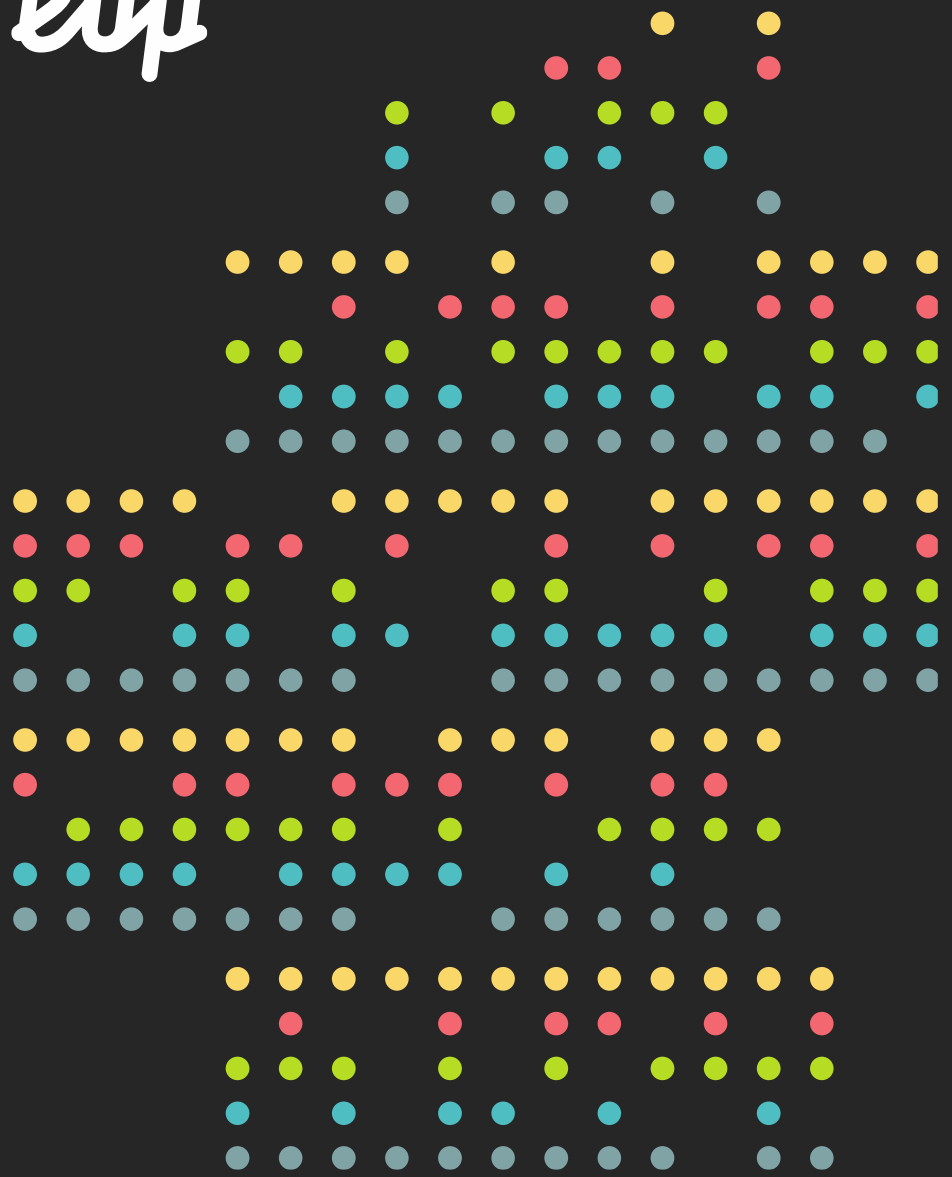
Questions?





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Thank you!

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