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Annex 1:  
IoT-NGIN Open Call #1  
August 2021

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## List of Abbreviations and Acronyms

AGV	Automated Guided Vehicles
AGLV	Automated Guided Land Vehicles
AR	Augmented Reality
AWU	Annual Work Unit
CET	Central European Time
DLT	Distributed Ledger Technology
DT	Digital Twin
EC	European Commission
EU	European Union
KPI	Key performance Indicator
GDP	Gross Domestic Product
M2M	Machine to Machine
MCM	Machine Cloud Machine
ML	Machine Learning
NGI	Next Generation Internet
RTD	Research and Technological Development
SME	Small and Medium-sized enterprises
TRL	Technology Readiness Level
VAT	Value Added Tax

# 1 Introduction

The IoT-NGIN (Next Generation IoT as part of Next Generation Internet) is a project funded under the H2020 framework. Its strategic objective is to unleash the power of Next Generation IoT as an essential dimension of the Next Generation Internet (NGI) and become the “IoT Engine” that fuels that transition to an Intelligent Internet of Everything.

To enhance the public awareness and increase the IoT-NGIN community ecosystem, IoT-NGIN will organize 2 open calls. The objectives of the open calls are:

- a) to enhance IoT-NGIN with additional (HW/SW) solutions contributing in IoT-NGIN technology validation and User Acceptance evaluation with innovative Use Cases,
- b) to increase awareness and interest on IoT-NGIN technology and solutions,
- c) to motivate DIHs and clusters to promote and adopt IoT-NGIN technologies and
- d) to engage IoT device manufacturers and applications developers, stakeholders, decision makers to enter and make sustainable the IoT-NGIN ecosystem.

**IoT-NGIN invites IoT devices manufacturers, embedded software and FPGA/soft core SMEs to join the IoT-NGIN consortium by offering a) open interfaces and access to their IoT systems or b) embed IoT-NGIN meta-architecture extensions and/or porting IoT software components to FPGA/soft core.**

**The funding for each new participant will be up to 150K€ and it is expected that at least 5 new partners will join the IoT-NGIN consortium via this open call. The new partners will have all the benefits and responsibilities of IoT-NGIN consortium members.**

## 1.1 Background information on IoT-NGIN project

It is well known that the Internet of Things (IoT) has been identified as one of the next big concepts to support societal changes and economic growth, and one of the fastest growing ICT segments. A whole new range of applications that leverage data and metadata from connected “things” provide novel human-centric services in areas such as smart city and urban mobility, human-centric industry 4.0, smart agriculture, and smart energy management. Within the IoT-NGIN (read as “IoT Engine”) project, we consider a “thing” as *any kind of sensor, actuator, wearable device, smart phone or autonomous system, such as autonomous guided vehicles (AGVs), robots or drones with networking capabilities*. We can consider as a “thing” even a group or swarm of things that behave as an autonomous, self-organised system.

In the evolving next generation IoT era, we consider that the biggest challenges are:

- a) to research towards **federated on-device intelligence**, so that the “things” react as self-aware, and when applicable user-aware/ human-centric, semi-autonomous entities, even when their resources are constrained or network connectivity is not reliable,
- b) to enforce **interoperability and data sovereignty**, overcoming scalability and fragmentation of vertically oriented, closed systems,
- c) to ensure **trust, cybersecurity and privacy** and
- d) to introduce **novel human-centric interaction** based on Augmented Reality (AR).

However, replacing or “integrating” existing IoT architectures and platforms with a new, “super-architecture” or “super middleware”, located at the edge cloud or at a logically higher level and translating or interpreting applications’ requests to existing platforms’ queries has significant functional and non-functional limitations. Instead, we believe that it is more than important not to “reinvent the wheel”, but to base our research on mature results and leverage on existing technologies, such as 5G communications, edge cloud computing,

inter-DLTs and federated AI, in order to go beyond today's state of the art, perform research and create innovation that can be sustainable. **The strategic goal of IOT-NGIN is unleash the power of Next Generation IoT as an essential dimension of the Next Generation Internet (NGI) and become the “IoT Engine”.**

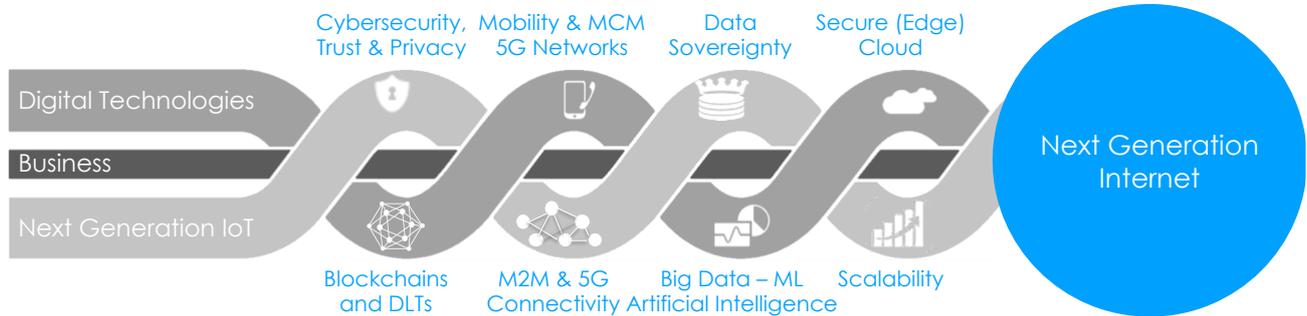


Figure 1: Next Generation IoT in the path towards Next Generation Internet

As shown in Figure 1, the main idea behind IoT-NGIN is **to research and create sustainable innovation towards NGI by introducing key digital technologies such as blockchains/inter-DLTs traceability, Machine to Machine (M2M) and (standalone) 5G Machine Cloud Machine (MCM) communications, AI and secure (edge) cloud at “things” level**, so that it will be able to interact in an open and (semi-) autonomous way with any existing and forthcoming “thing” or IoT platform in a scalable and federated rather than integrated approach.



Figure 2: IoT-NGIN focus

Beyond networking, data sovereignty has recently emerged as a critical issue of personal, national and regional economic importance, as the ability to control the use of data is continually being eroded by global industries, such as social media platforms, and the data itself is becoming a product. Current IoT systems generate enormous volumes of data but they lack an association between the data and the identity or the role of those who have the authority to decide how the data is to be used. New techniques are required to store and process the data securely and ensure that the relevant data owners are able to control IoT data utilization in a secure, trusted and privacy preserving way. IoT-NGIN focuses on various IoT related technologies including

- 5G New Radio & Edge Cloud connectivity
- Resource Self-Awareness & Dynamic Connectivity
- Cross Blockchains/DLT data sovereignty and Smart Contracts
- Federated ML/ Edge Cloud ML Aggregation
- Trained ML model sharing (e.g. AGV)
- Human Centric Ambient Intelligence/Augmented Reality based sensing/control
- IoT Cybersecurity/Attacks on Privacy preserving ML
- Privacy preserving Cross-Trial/ borders Federation

The IoT-NGIN outcomes will be validated across a multitude of real-life use cases through 7 trials, involving 5 living labs and 1 IoT/5G lab. The IoT-NGIN pilots and living labs are:

- Trial #1: IoT-NGIN Integration Infrastructure Technology Lab

- Trial #2: Human-Centred Twin Smart Cities Living Lab
- Trial #3: Smart Agriculture IoT Living Lab
- Trial #4 & Trial#5: Industry 4.0 Use Cases & Living Lab
- Trial #6: Smart Energy Grid Active Monitoring/Control Living Lab
- Trial #7: IoT-NGIN Technology and Living Labs Federation

More information is available at <https://iot-ngin.eu/>.

**It is important to note that all new technological components implemented via the Open Call #1 will be offered as Open Source (HW/SW) under the proper Open Source License. All IoT-NGIN developments (existing and introduced via IoT-NGIN Open Call #1) will be utilized by the applicant SMEs that will be invited via IoT-NGIN Open Call #2 to test and validate the IoT-NGIN Technology.**

## 1.2 Origin of the funds

Any selected proposer will be inserted in the IoT-NGIN consortium via an Amendment to the IoT-NGIN Grant Agreement. This activity will take place via the relevant European Commission electronic system.

**The funds to the new consortium member come directly from the funds of the European Project IoT-NGIN funded itself by the Directorate-General for Communications Networks, Content and Technology, and remain therefore, property of the EU until the payment of the balance, whose management rights have been transferred to the project partners in IoT-NGIN via European Commission Grant Agreement Number 957246.**

This relation between the new partners and the European Commission through IoT-NGIN project carries a set of obligations with the European Commission<sup>1</sup>.

## 1.3 IoT-NGIN approach & Funding Scheme

As already explained, IoT-NGIN will organize two open calls:

- Open Call #1 will select at least 5 new partners, who will join the IoT-NGIN consortium in M19 (April 2022). Open Call #1 targets IoT devices manufacturers, embedded software and FPGA/soft core partners to join the IoT-NGIN consortium by offering a) open interfaces and access to their IoT systems or b) embed IoT software components running on FPGA/soft cores.
- Open Call #2 will start at M28 (January 2023) and allowing new partners to enter the IoT-NGIN consortium and validate IoT-NGIN technology via innovative IoT applications and services that use heterogeneous IoT and IoT-NGIN components to offer new services for 9 months (1/1/2024 – 30/9/2023).

The selected partners will be funded as follows:

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<sup>1</sup> More information available at [https://ec.europa.eu/research/participants/docs/h2020-funding-guide/index\\_en.htm](https://ec.europa.eu/research/participants/docs/h2020-funding-guide/index_en.htm)

Table 1: New partners funding schema for Open Call #1

Funding %	Funding (in EUROS)	Condition / Event
75%	Up to 112.500€	After inclusion of the partner in IoT-NGIN Amended Grant Agreement and signature of the IoT-NGIN Consortium Agreement (estimated time M19/April 2022)
Up to 25 %	Up to 37.500€	After reporting of the actual costs, final review of the project and costs' acceptance of the Funded Authority (European Commission)*

\*It should be noticed that:

- All the payments to be made promptly after the coordinator receives the same from EU commission.
- The Coordinator is entitled to withhold any payments due to a Defaulting Party except the amount of contribution that the Funding Authority, after acceptance of reporting, decides to be provided to the Defaulting Party.

## 1.4 Timeline – Open Call #1

Submission to the Open Call #1 will be enabled on the 1<sup>st</sup> of October 2021 and will end on the 30<sup>th</sup> of December 2021 at 17:00CET time (Brussels time). Below are presented the dates for the different phases. The opening and closing dates of each phase can be subject to change in case of any modifications in the project's schedule.

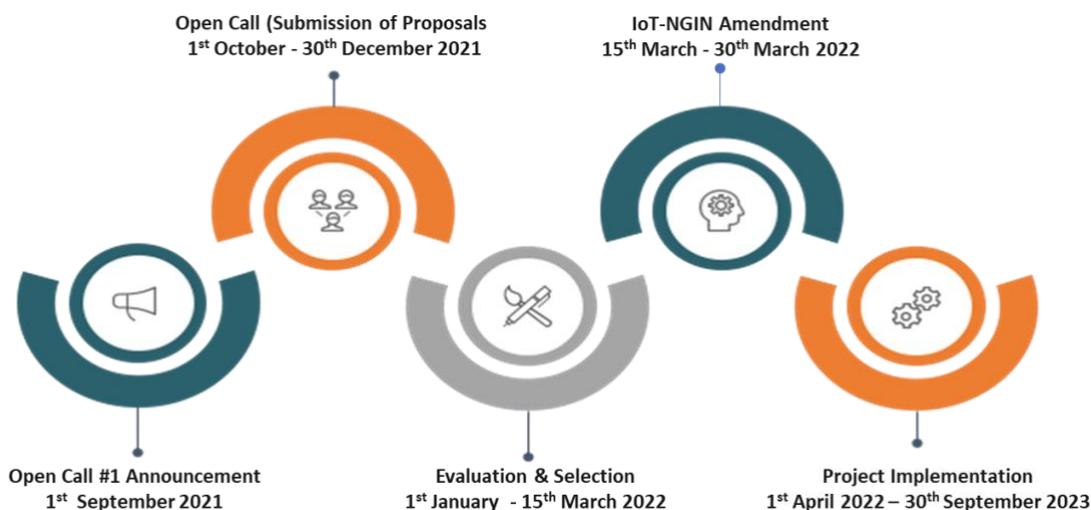


Figure 3: IoT-NGIN Open Call #1 timeline

## 2 Open Call submission and selection process

IoT-NGIN Open Call #1 targets IoT devices manufacturers, embedded software and FPGA/soft core partners to join the IoT-NGIN consortium. The following figure summarizes the open call process:

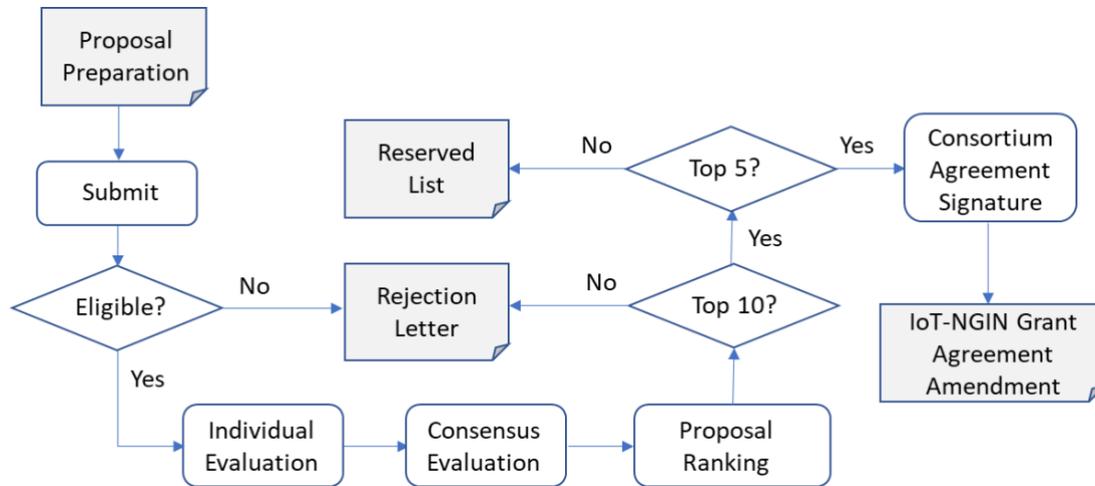


Figure 4: IoT-NGIN Evaluation process summary

After initial eligibility checking, **two (2) IoT-NGIN consortium external evaluators** with experience in IoT technologies, the relevant IoT-NGIN activities and business development will evaluate each proposal, scoring it based on the following evaluation criteria:

Criteria	Description
<b>Criterion 1: Concept and Innovation</b>	<ul style="list-style-type: none"> <li>• Innovation, novelty and feasibility of the proposed subsystem objectives.</li> <li>• Design, reliability, feasibility, and quality of the proposed subsystem.</li> <li>• Level of innovation and technological challenges addressed.</li> </ul>
<b>Criterion 2: Technology</b>	<ul style="list-style-type: none"> <li>• Analysis of the technological and implementation capacity (current/target TRL)</li> <li>• Quality and feasibility of the workplan (including proposed milestones).</li> <li>• Quality of the alignment with the IoT-NGIN project.</li> <li>• Details on how the proposed components will be tested and validated at the IoT-NGIN pilot/living labs.</li> </ul>
<b>Criterion 3: Impact</b>	<ul style="list-style-type: none"> <li>• Economic and societal impact of the proposed subsystem</li> <li>• Market potential and go to market strategy</li> <li>• European dimension, cross-sector/-border business scalability</li> <li>• Exploitation strategy/ business plan and commercialization milestones.</li> </ul>
<b>Criterion 4: Applicant Entity/Team</b>	<ul style="list-style-type: none"> <li>• Capacity to applicant entity/team to perform the task</li> <li>• Knowledge, technological and business expertise</li> <li>• Financial viability/stability</li> <li>• Commitment of the company and the team</li> <li>• Allocation and justification of requested resources</li> </ul>

Each evaluator will record his/her individual evaluation/opinion of each proposal on an Individual Evaluation Report. After individual evaluation, the experts will communicate to prepare a single consensus Evaluation Summary Report (ESR) for each proposal, representing

opinions and scores on which the evaluators agree and which they will sign. At the end of the evaluation process all proposals will be ranked in a single list. The criteria for the ranking of the proposals will be semi-automatic following the specific rules as explained in *Annex 2: Guide for applicants*.

### 3 Open call overview

Table 2 provides a summary of the IoT-NGIN Open Call #1.

Table 2: Details of the IoT-NGIN Open Call #1

Open Call item Information	Open Call item Information
Call title:	IoT-NGIN – Open Call #1
Full name of the EU funded project:	Next Generation IoT as part of Next Generation Internet
Project acronym:	IoT-NGIN
Grant agreement number:	H2020 - 957246
Call publication date:	1 <sup>st</sup> September 2021
Call deadline:	30 <sup>th</sup> December 2021
Expected duration of participation:	18 months (1 <sup>st</sup> April 2022 – 30 <sup>th</sup> September 2023)
Total EU funding available (Open Call #1):	€ 750.000
Submission & evaluation process:	<p>The objective of the IoT-NGIN – Open Call #1 is to expand IoT-NGIN consortium with IoT devices manufacturers, embedded software and FPGA/soft core partners to offer a) open interfaces and access to their IoT systems or b) embed IoT software components running on FPGA/soft cores.</p> <p>All IoT-NGIN developments will become available as Open Source (HW/SW) and will be validated/tested in 7 IoT-NGIN pilots/living lab by IoT-NGIN consortium and new participants via IoT-NGIN Open Call #2 (to be announced).</p> <p>The Open Call #1 will have a single phase where up to five (5) proposals will be selected. The maximum amount of funding per awarded applicant is €150.000.</p> <p>Submissions are available via <a href="https://www.f6s.com/iot-ngin-1st-open-call/apply">https://www.f6s.com/iot-ngin-1st-open-call/apply</a></p>
Further information:	Details available at <a href="https://iot-ngin.eu/index.php/open-calls/">https://iot-ngin.eu/index.php/open-calls/</a>

## 4 Contacts

The IoT-NGIN consortium will provide information to the applicants only via the F6S blog, so that the information (question and answer), will be visible to all participants.

No binding information will be provided via any other means (e.g. telephone or email).

More info at: <https://iot-ngin.eu/>

Apply via: <https://www.f6s.com/iot-ngin-1st-open-call/apply>

F6S support team: [support@f6s.com](mailto:support@f6s.com)

Q&A document: <https://iot-ngin.eu/wp-content/uploads/2021/09/Annex-7.-IoT-NGIN-Open-Call-1-FAQ.pdf>

Online Q&A: <https://www.f6s.com/iot-ngin-1st-open-call/discuss>

Other support<sup>2</sup>: [opencalls@iot-ngin.eu](mailto:opencalls@iot-ngin.eu)

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<sup>2</sup> For non-binding information

## 5 References

- [1] Digital Innovation Initiatives based on European Networks of Competence Centres in H2020, available online at <https://smartanythingeverywhere.eu/smart-anything-everywhere/>
- [2] REGULATION (EU) No 1290/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 laying down the rules for participation and dissemination in "Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020)" and repealing Regulation (EC) No 1906/2006
- [3] EUROPEAN COMMISSION, Directorate-General for Communications Networks, Content and Technology, "Guidance note on financial support to third parties under H2020", Annex K. "Actions involving financial support to third parties", [http://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2016\\_2017/annexes/h2020-wp1617-annex-k-fs3p\\_en.pdf](http://ec.europa.eu/research/participants/data/ref/h2020/other/wp/2016_2017/annexes/h2020-wp1617-annex-k-fs3p_en.pdf)
- [4] H2020 Call Objective ICT-04-2017 TOPIC: Smart Anything Everywhere Initiative, <https://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/ict-04-2017.html>
- [5] Annex 2: Guide for applicants, <https://iot-ngin.eu/index.php/open-calls/>