OPEN CALL #2

Guide for Applicants

Launch date: 20th January 2024

ON A FIRST-COME-FIRST SERVED BASIS

1. SCOPE AND TERMS OF THE OPEN CALL

1.1. General objectives

The project 5G-IANA , funded by the European Union's Horizon 2020 research and innovation programme under grant agreement No 101016427, organises its 2nd Open Call for the involvement and engagement of "third parties" with the 5G-IANA "Automotive Open Experimental Platform (AOEP)".

The intended audience of this Open Call is any legal entity in the form of a **Small and Medium-sized Enterprise (SME / start-up)**, which is working in any mobility-related vertical (i.e., automotive / industry 4.0 / aviation / robotics / etc.), and which is already developing or is interested in developing or testing a product / service / functionality that leverages 5G capabilities through the 5G-IANA platform. The scope of this Open Call is to help SMEs develop and integrate their innovative idea using the 5G-IANA platform.

The profile of the SME that may be suitable for experimentation on the 5G-IANA platform may be one of the following (not an exhaustive list):

- **Service Creators**: all types of service creation entities such as software developers, who develop services or applications that need 5G connectivity to run effectively.

- **Service Providers:** who are responsible for providing a service to end users (for example Intelligent Mobility, HD maps, Localisation, etc.), that also needs 5G connectivity to run effectively.

- **Hardware providers:** who are responsible for providing a new product that needs to operate over 5G, and communicates effectively with the services running over 5G.

The Project invites SMEs and start-ups to run their experiments on top of the 5G-IANA platform. Through the project's Open Call, which offers a ***mentorship program***, we help SMEs to build their experiments and position themselves in the 5G ecosystem. Our mentors will guide the selected SMEs through designing, developing, deploying, and testing services on the 5G-IANA platform.

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1.2. Anticipated gains by participating in the Open Call

The participants of the Open Call (which will be selected based on a process and criteria described in Section 4) will reap the following benefits offered by 5G-IANA:

- Gain access to a "canvas" to develop new functions and services in the automotive 5G landscape.
- Test and validate their existing or new services / products / use cases in real-time using 5G connectivity.
- Gain access to real-life 5G resources (vehicles, On-Board Units, Road-Side Units, EDGE/MEC Server(s), 5G radio resources).
- Have the option and opportunity to travel to our 5G testbeds in NOKIA (Germany) or Telecom Slovenia, to conduct their experiments live with our continuous support.
- Get continuous mentorship and support from network and automotive experts.
- Explore/Build new business models within the 5G ecosystem.
- Gain visibility towards the EU, the 5G community and automotive community.

Specifically, the offerings to the selected participants by 5G-IANA will be:

- Access to the 5G-IANA platform to develop, deploy and test their services (with continuous support and technical manuals provided).
- A catalogue of ready-to-use software functions, that implement both network and application level functionalities (with a complete Catalogue description of this software).
- Carefully selected and targeted chains of network and application level functionalities that create full end-to-end services (called Network Applications, approx. 25) – explanation and examples of these service chains are provided.
- Tools to prepare and onboard their own software functions on the 5G-IANA platform, to support a specific functionality or to test a novel use case scenario over 5G.
- Indicative examples and experience regarding the actual deployment of use cases of the 5G-IANA consortium into the platform, i.e.: automotive-related services in the hazard-notification, infotainment, vehicle movement or even vertical-agnostic domain (*more information here*).

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- Remote accessibility to 5G resources (through NOKIA's site in the City of Ulm, Germany / Telecom Slovenia's site in Ljubljana).

- Accessibility to On-Board Unit (OBU) / Road-Side Unit (RSU) resources through the 5G-IANA platform, as well as experimentation opportunities potential using real vehicles.

- Support to Machine Learning (ML)-oriented services (if needed), through our "Edge Orchestration and Federated Learning" framework.

- Technical support material in the form of a technical manual, webinars, videos with success stories, and other published material.

- Mentorship, training, technical assistance and support.

- Business model mentoring.

- Access to 5G-IANA project's network of professionals, media, and partners.

- Funding to support the SMEs in their experiments.

1.3. Eligibility criteria

The call is open to SMEs and start-ups legally established in an eligible country. Legal entities must be established in the Member States of the European Union and associated countries according to the Horizon Europe rules . An SME will be considered as such if accomplishing with the Commission Recommendation 2003/361/EC and the SME user guide .

Only one entity per proposal is allowed (no consortia are allowed).

The applicant must be completely independent of project partners, their affiliated entities and/or their controlled companies. Institutions, organizations or other kinds of legal entities funded by or otherwise affiliated with a 5G-IANA partner are not eligible. 5G-IANA retains the right to discard the selected application in case one (or more) of the conditions above are not satisfied.

1.4. Eligible countries

Only applicants legally established and operational in any of the following countries will be eligible:

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- The Member States of the European Union, including their outermost regions.
- The Overseas Countries and Territories linked to the Member States .
- H2020 Associated countries: according to the updated list published by the EC .
- · The UK applicants are eligible under the conditions set by the EC for H2020 participation.

2. PROJECT OVERVIEW

2.1. Basic terminology

Application Function (AF) / Network Function (NF):

- An Application Function is a component that implements the logic of a service, instead, a Network Function is used for communication and networking tasks.

Network Application (network app):

- A network app is a composition of atomic components (AFs and NFs) that can communicate with each other and can be instantiated separately with different requirements

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2.2. 5G-IANA concept and approach

5G-IANA aims at providing an open 5G experimentation platform, on top of which third-party experimenters, i.e., SMEs in the Automotive vertical sector will have the opportunity to develop, deploy and test their services. The provided ***Automotive Open Experimentation Platform (AOEP)*** is a set of hardware and software resources that provides the computational and communication/transport infrastructure as well as the management and orchestration components, coupled with an enhanced network app Toolkit tailored to the Automotive sector, for simplifying the design and onboarding of new network apps. 5G-IANA exposes to experimenters secured and standardized Application Programming Interfaces (APIs) for facilitating all the different steps towards the production stage of a new service. 5G-IANA targets different virtualization technologies integrating different Management and Orchestration (MANO) frameworks for enabling the deployment of end-to-end network services across different segments (vehicles, road infrastructure, Multi-access Edge Computing (MEC) nodes and cloud resources). 5G-IANA network app toolkit is linked with an Automotive Virtual Network Functions (VNFs) Repository including an extensive portfolio of ready-to-use and openly accessible Automotive-related VNFs and network app templates, that are available for

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SMEs to use and develop new applications. Finally, 5G-IANA develops a Distributed Machine Learning (DML) framework, that provides functionalities for simplified management and orchestration of collections of Machine Learning (ML) service components and thus, allows ML-based applications to penetrate the Automotive world, due to its inherent privacy-preserving nature. 5G-IANA will be demonstrated through seven Automotive-related use cases in two 5G Stand Alone (SA) testbeds. Moving beyond technological challenges, and exploiting input from the demonstration activities, 5G-IANA will identify and validate market conditions for innovative, yet sustainable business models for the AOEP platform, supporting a long-term roadmap towards the pan-European deployment of 5G as a key advanced Automotive services enabler.

2.3. 5G-IANA platform capabilities

The main capabilities and features of the AOEP platform at the disposal of the experimenters of this Open Call are the following:

- The AOEP is an enhanced Automotive-related experimentation infrastructure (including the vehicles) where an AFs/NFs Repository exists, along with the hosting of a number of network application (network app) Starter Kits, i.e., simple examples of different network apps that third parties (i.e., SMEs) can use as a baseline to develop their own network apps or that can be included in Vertical Service chain to consume exposed services.

- It offers functionalities for designing, validating, and benchmarking/experimenting Vertical Services and their components (i.e., network apps and NFs/AFs) and thus, provides functionalities for easing the design and chaining of new Automotive-related services.

- It offers the ability to deploy and orchestrate Vertical Services from the application point of view, and to monitor them at run-time.

- It allows the deployment of services at the edge of the network (on OBUs and RSUs), and by doing so reduces the end-to-end application latency of services, as well as supporting privacy for sensitive application data. Especially, it allows to implement/integrate a “lightweight” orchestration on top of OBUs/RSUs for offering a more flexible and scalable management of Vertical Services and constituent network apps and AFs/NFs.

- It provides the appropriate end user graphical interface, allowing: a) the onboarding of the application components (in form of microservices), b) the editing of the functional application component parameters (e.g., required CPU, Memory,

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- location of image, dependencies on other components etc.), c) the selection or definition of monitoring metrics from the application components, d) the linking of application components to form service network apps combining application-related components (i.e., AFs) and networking related components (i.e., NFs), e) the editing of functional operating parameters (e.g., location, targeted latency and bandwidth limits, linking to access UIs, etc). Overall, it provides a user-friendly and openly accessible environment to experimenters for the experimentation, validation and testing of their applications with ease.

- According to these objectives, the AOEP is designed as a multi-layered platform that extends from the end user (application) layer to the infrastructure layer and optimally combines context and network infrastructure-aware functionalities for the deployment of advanced services represented as linked chains of virtualised functions (application, network, and communication functions).

2.4. Project testbeds

5G-IANA will utilize 2 different 5G SA test networks.
Nokia operates an LTE/5G test network in Ulm, Germany. The on-air testbed consists of 5 antenna sites with up to 3 radio cells each. Currently, 5G radio access is supported at selected sites on band 38 (2.6GHz/TDD). Nokia also provides processing capabilities close to the antenna sites, i.e., Nokia provides Multiple-Access Edge Computing (MEC) capabilities.

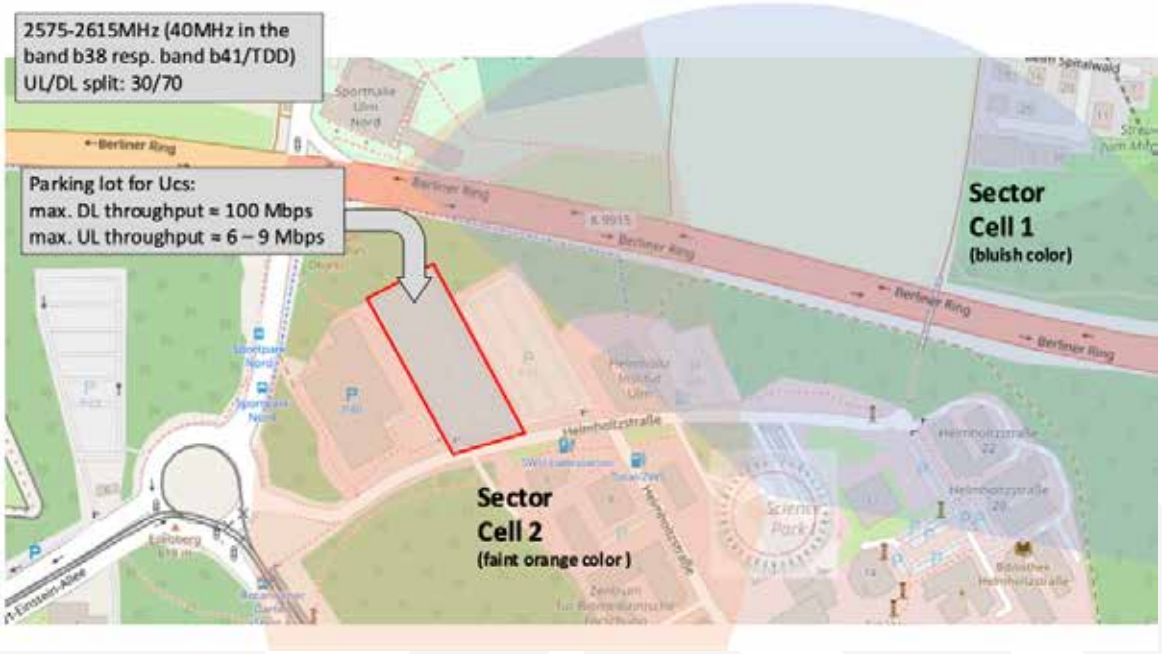

Figure 1: Sector cells at antenna site DRK and the cell capacities at the parking lot for UC testing. (map picture source: OpenStreetMap)

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Telekom Slovenije provides a dedicated 5G infrastructure located at its premises in Ljubljana for the 5G-IANA project's demonstrations. The infrastructure consists of a cloud and virtualisation environment, network connectivity, 4G – LTE radio access network (CA, Nb-IoT, VoLTE,) as well as a 5G radio access network and a 5G ready core network based on EPC extensions.

More details about the testbeds are available on the project's ***website.***

3. HOW TO APPLY

This section outlines the procedures for the submission of applications to the 5G-IANA Open Call. As a summary (details are available in the following sections):

- The applicants must use original work in their proposal.
- Proposals must provide details on how they will leverage the 5G-IANA platform.
- Proposals must be written in English and be ***submitted online*** in order to be eligible. The application template can be found here.
- Incomplete proposals will not be evaluated.

3.1. Application form

The Application Form is in the form of a Word Document, and requires filling in information regarding the following aspects (Sections):

- 1. General information about the applicant: Contact point, organization name and type, short description of business profile, country.
- 2. Ambitions and development plans: Description of service, solution, functionality or product that the applicant would like to deploy on the platform, and details about the proposed experiment on the 5G-IANA platform.
- 3. Previous experience: Prior experience with network applications'/virtual functions' development and with 5G.
- 4. Expectations from the platform: Expectations regarding the area covered by a 5G testbed, draft estimate of required resources in terms of hardware and software resources, and anticipated testbed time allocation.

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- 5. Expected impact: Anticipated leverage on the 5G-IANA platform and potential impact on the applicant's business portfolio.

The previous categories are broken down into specific questions in the application form. All fields are mandatory to be filled in.

3.2. Submission of applications

The Application Form shall be completed and submitted online any time after the launch of the Open Call (20 January 2024). Applications will be received and evaluated until the available funding has been exhausted.

Nevertheless, applicants are strongly recommended to submit their applications as soon as possible after the Open Call launch. All experiments will need to be concluded by October 2024, regardless their complexity. Therefore, the application date needs to leave sufficient time for planning and conducting the experiments.

5G-IANA will send a confirmation receipt to the e-mail address applying; such confirmation does not certify that the application is complete and suitable for evaluation, but simply that the application has been successfully received.

3.3. Further information for the applicants

Applicants are invited to visit the ***5G-IANA Open Call page*** regularly, in order to get the latest news about the call.

In case of specific queries on the call, applicants may write an e-mail to ***open-call@5g-iana.eu*** with the subject "Support" to receive help from the 5G-IANA Applicant Helpdesk team.

The following Table provides a summary of the general timing of the 5G-IANA Open Call.

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Table 1: Timeline of the 5G-IANA Open Cal

Activity	Timeline
20 January 2024	Launch of the Open Call
19 March 2024	Info Day
20 January onwards (on a rolling basis)	• Step 1: Submission of application • Step 2: Application evaluation *(within 1-2 weeks)* • Step 3: Acceptance or rejection of an application & notification • Step 4: Micro-project agreement preparation and signing Release of funding installment 1 • Step 5: Start of the experiment Experimentation activity with mentorship support
October 2024	• Deadline for the conclusion of the experiment • Final report & video • Release of funding installment 2

This timeline is subject to change in case of a deadline extension.

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3.4. Other helpful material

The applicants may refer to the 5G-IANA website to get more familiar with the project platform, use cases, and testbeds, as well as with the project outcomes and experimenter "success stories" so far, and to be informed about upcoming webinars. Downloadable material is at the disposal of the applicants, and it may be updated in the course of time if needed. The most useful material includes:

- Technical manual (user platform guide) – available here. This manual is a useful tool to help the experimenters better understand how Use Cases (UCs) and new services can be implemented, onboarded and run on the AOEP platform (as a guide/example to develop new UCs). Specifically, it contains the following information:
    - 1. Some definitions are given in order to comprehend the 5G-IANA project.
    - 2. The development and "packaging" process is explained, as well as how the developed components can enter into the 5G-IANA ecosystem.
    - 3. The concatenation of the various developed functions to create a network application deployable on a 5G-enabled environment is described.
    - 4. The list of network apps already available in the 5G-IANA repository is described, which can be used by experimenters.
    - 5. The "onboarding" operation that a developer should do to deploy a 5G enabled network application is presented.
    - 6. A step by step guide to assist with the onboarding process of software artefacts to the 5G-IANA platform and with network app composition, and it refers to the expert user, namely to the user who has already been trained for using the 5G-IANA platform.

- Manual of the Application Functions (AFs), Network Functions (NFs) and Network Applications provided by the platform – available here: Description, Input required, Output provided, Examples of communicating AFs/NFs, so that applicants/experimenters can understand how they could combine their proprietary functions with 5G-IANA's AFs/NFs, in order to create new chains of functions. These functions could be the basis for inspiration to SMEs for developing new functions and services.

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- Project deliverables – as they are continuously published on the 5G-IANA website in the relative Section as well as in Zenodo. Open Access has been ensured for all related project deliverables.

- Webinars, including an Info Day about the Open Call (March 2024)..

4. AFTER THE APPLICATION: WHAT TO EXPECT

4.1. From Application to Selection

4.1.1. Eligibility status

Once submitted, every received application will be first filtered according to its eligibility status, based on criteria described in Section 1; for any non-eligible applications, no further processing will take place. Extra information may be requested by the SMEs to validate their legal entity and SME characterization.

4.1.2. Feasibility status

Every eligible application will further undergo a feasibility check: This process will ensure that the proposed type of experiment is a) in context with the 5G-IANA project and call scope, i.e., related to mobility (e.g. automotive or relative sector) that is meaningful and can be supported by the platform, b) the SME has the basic technical expertise to allow getting familiarised with the platform basics and be in the position to complete the experimentation after receiving the required training and support, c) has developed, is developing, or plans to develop a software function/service/application/product/use case that will leverage the 5G-IANA platform and 5G network, and d) the experiment can be concluded within the prescribed timeline described in Section 3.3 (i.e., the latest until October 2024).

Every application that has passed both checks will be accepted to proceed with experimentation using the 5G-IANA platform. Training will be offered to help the experimenters get acquainted with the project and the platform.
A maximum of 5 applications will be accepted on a First Come First Served basis (please refer to Section 4.6 for more details).

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4.2. From Selection to Experimentation

4.2.1. Logistics

The selected applications from the procedure described in Section 4.1 will start the contracting phase.

The successful applicants will be informed by the contracting party (ICCS). They will be requested to sign a "Micro-project agreement" and provide Annexes on a) Declaration of Honor, b) SME declaration, c) Bank account copy, d) Certificate of registration, e) VAT proof. **The stakeholders responsible for the NOKIA or Telecom Slovenia testbed, where the Open Call solutions will be deployed, may add specific clauses to the contract.**

Please understand that access to a 5G testbed and its resources is a delicate process that needs careful planning and must comply with its internal processes and procedures. Granted applicants will be therefore asked to sign the appropriate NDAs with the involved and relevant project partners.

4.2.2.Validation and testing

The experiments are obliged to be concluded until October 2024 (incl. reporting – see Section 4.3), irrespective of the time of the application. The feasibility check will ensure that this requirement will be met.

After the announcement of each accepted application, the selected experimenters will be immediately invited to start discussions with the consortium's Mentors, so as to design their end-to-end experiments. The goal in this phase is, first, to define in detail the targets of the selected experiment, as well as its exact connection to the 5G-IANA platform. The exact experimentation process will be carefully designed together with the Project Mentors. In turn, this procedure will provide the involved experimenter with an understanding of the 5G-IANA platform environment and capabilities. Next, the developed solutions from the experimenters will be validated at the testbed of their preference (NOKIA in Ulm, Germany or Telecom Slovenia in Ljubljana, Slovenia), subject though to the recommendations of the Mentors and the resources of those testbeds (a fair allocation will be required so that the experiments are distributed between the two testbeds).

The activities include, but are not limited to:

- The creation of a detailed scenario / use case description building on the information included in the application of the experimenter. The proposed experiment will be revised together with the Mentorship team so as to identify gaps and propose enhanced use cases that leverage the 5G-IANA platform in the most effective way, as well as add value to the SME's business. The possibility to enhance their scenarios / experiments with functionalities offered by other

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- ICT-41 programs will be also investigated by the Mentors, and be proposed to the experimenters (guidance will be offered in this direction).

- The extraction of a detailed validation plan for the SME's involvement with clear deployment and testing targets, as well as identification of the required 5G-IANA infrastructure requirements.

- The familiarisation of the SME with the 5G-IANA platform capabilities and software components that may be linked or reused.

- The examination of the component(s) to fulfil the deployment requirements (e.g., in terms of exposed and required parameters, exposed interfaces and interconnection with targeted end user hardware, etc.).

- The identification of any potential changes or updates that may be required.

- The development of any required add-on components to interoperate with the 5G-IANA platform.

- The deployment of these components over the selected testbed, followed by testing.

- The actual experimentation process (validation and testing), with the opportunity and recommendation for physical attendance to the allocated testbed.

The exact validation methodology to be used by the SMEs will be the same as for the internal use cases of the 5G-IANA project, which is defined in 5G-IANA - D5.2 Validation methodology.

4.3. Reporting

The experimentation cycle ends with the creation of a report describing the activities that have been performed during the validation phase. The main content to be provided is the following (subject to changes):

- 1. Concept, Objectives, Setup and Background
- 2. Technical results and functionality validation
- 3. Impact and further exploitation
- 4. Feedback to 5G-IANA
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A specific template will be provided to help SMEs prepare this report.
Moreover, a questionnaire will be provided in order to collect feedback from the experimenters, that will need to be video-recorded (interview-style). The footage material is then going to be edited as a short video and provided to the experimenters for further exploitation and

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dissemination of their achievements by leveraging the 5G-IANA platform.

Finally, the experimenters will need to provide feedback to a short online survey with the objective to assess the acceptance of the platform.

4.4. Produced outputs

In case the produced outputs of the experiments lead to scientific publications or if they are presented in presentations or webpages, they should include an acknowledgement to 5G-IANA and the European Commission (respective logos).

4.5. Mentoring and support

Close mentorship and support will be provided to the selected experimenters so that they get familiarised with the platform and receive extensive support while designing and conducting their experiments.

- Technical support includes a ticketing system. Users can send an e-mail to helpdesk@5g-iana.eu, and then this will be handled by the 5G-IANA helpdesk as soon as possible. However, also direct communication with the Mentors and Project Coordinator is advised.

- Business model guidance: workshops will be organised to assist SMEs, if needed and requested by them, to develop their business model and thus speed up the process of getting their results from the experimentation closer to the market.

The Mentors of 5G-IANA Open Call are listed here.

4.6. Funding

A total funding of 100000 euros is available for this Open Call.

The procedure for releasing the funding will be initiated immediately after the completion of the evaluation process and the signing of the micro-project agreement (along with all documents described in Section 4.2). Thus, for the SMEs that have been selected to participate in the Open Call, 30% of the budget will be provided to them at this stage (approx. M1 of the experiment).

Then, all successfully conducted experiments (i.e., having successfully collaborated with 5G-IANA partners and delivered the final report and dissemination material) will be handed the rest of the funding (70% of the funding).

A maximum of 5 SMEs' experiments will be accommodated on a First Come First

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Served basis, leading to a funding of 20000 euros to each one. A monitoring process will ensure that all accepted applicants are committed to conclude their experiments and are continuously and sufficiently progressing with their expected validation activities. In case that 5G-IANA Mentors identify a breach by a third party of its obligations regarding proceeding and concluding their experiment, they have the right to terminate this collaboration, so that another, new, application can be accommodated.

In case more that 5 SMEs apply to the Open Call, the ones that apply later can still experiment with the project but with no financing (unless some budget becomes available due to non-accomplishment of the experiment by a previously accepted proposal).

All legal and formal procedures will be followed in order to provide the funding to the selected experimenters.

For any enquiries regarding the Open Call, please contact at open-call@5g-iana.eu

An info day to promote the Open Call will take place in 19 March 2024. It will be recorded and uploaded on the website for future reference. Please visit the website for further information.

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