1st Call Announcement and Guide for Applicants Deliverable

Deliverable D7.1

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The TARGET-X project has received funding from the Smart Networks and Services Joint Undertaking (SNS JU) under the European Union's Horizon Europe research and innovation programme under Grant Agreement No: 101096614

TITLE	
GRANT AGREEMENT	101096614
PROJECT TITLE	Trial Platform foR 5G EvoluTion – Cross-Industry On Large Scale
PROJECT ACRONYM	TARGET-X
PROJECT WEBSITE	www.target-x.eu
PROGRAMME	HORIZON-JU-SNS-2022-STREAM-D-01-01 — SNS Large Scale Trials and Pilots (LST&Ps) with Verticals
PROJECT START	01-01-2023
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EDITOR(S)	ANETA GAŁĄZKA, PAULINA JANKOWSKA
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SHORT ABSTRACT	This deliverable contains the information and the requirements for the applicants to the 1st Open Call.
KEY WORDS	Call Announcement, Guide for Applicants
CONTRIBUTOR(S)	WP7 Partners

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Executive Summary

The deliverable contains the Open Call Documents prepared for the TARGET-X 1st Open Call.
The prepared documents contain the information and the requirements for the applicants to the 1st Open Call. The documents are published on the dedicated microsite: https://target-x.fundingbox.com/pages/documents

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List of Acronyms and Abbreviations

TARGET-X - Trial Platform foR 5G EvoluTion – Cross-Industry On Large Scale

SME - Small and medium-sized enterprises

EU – European Union

FSTP - Financial Support to Third Parties

Competitive Calls and
HORIZON Financial Support to Third Parties
TARGET-X- 1st Open Call for Applicants- Call Announcement

Call title:	*TARGET-X First Open Call*
Full name of the EU funded project:	Trial PlAtform foR 5G EvoluTion – Cross-Industry On Large Scale
Project acronym:	TARGET-X
Grant agreement number:	101096614
Call publication date:	9th of May 2023 at 13:00 Brussels Time
Call deadline:	26th of July 2023 at 17:00 Brussels Time
Expected duration of participation:	*7 months* *Stage 1 'Individual Follow Up Plan' Before* *Stage 2 Project development report* *Stage 3 Market uptake report*
Total EU funding available:	€ 3 000 000 (1st TARGET-X Open Call)
Submission & evaluation process:	Submission through the application form available on: https://target-x.fundingbox.com/ The selection of the Open Call proposals will be carried out in a seven steps process. ● **Step one** will check the proposals against admissibility and eligibility criteria. ● **Step two** (In/Out Scope Screening) will involve a 'Selection Committee' to assess the proposal according to the criteria (one partner per proposal). ● **Step three** will involve independent experts to assess the proposal according to the criteria (two experts per proposal). ● **Step four** will involve the TARGET-X Consensus Group to agree on a common position, including comments and scores for all evaluated proposals. ● **Step five** will involve the 'Selection Committee' to decide the 'List of Finalists' and 'Reserve List'. ● **Step six** will check the ethical aspects of the selected proposals. ● **Step seven** will include the review of legal documents before the SubGrant Agreement signature. For further information see the Guide for Applicants.
Further information:	Application form: https://target-x.fundingbox.com/apply OC helpdesk: https://spaces.fundingbox.com/spaces/iot-community-target-x-helpdesk OC helpdesk email: contact.target-x@ipt.fraunhofer.de OC website: https://target-x.fundingbox.com/ Project website: https://target-x.eu/

Task description:	The exact amount of financial support to be granted to each selected entity under the 1st TARGET-X Open Call is up to €60 000 per entity. If applying as a consortium, the funding will be up to €120 000. The results from projects oriented to the development of devices or solutions, will be integrated the project's repository. The technology will be available in Open-Source Code and with open interfaces for further reutilisation in the subsequent phase (i.e. beneficiaries of the 2nd TARGET-X Open Call).

ADDITIONAL INFORMATION

TARGET-X is a project co-funded by the European Commission, from the HORIZON EUROPE programme. It is coordinated by FRAUNHOFER Gesellschaft Zur Forderung Der Angewandten Forschung Ev with the participation of 14 consortium partners from 6 countries (see details at https://target-x.eu/)

The total Target-X budget of cascade funding (Financial Support to Third Parties - FSTP) is €6 000 000 of which approximately €3 000 000 will be distributed under the 1st TARGET-X Open Call: Testing and development of devices/solutions.

The TARGET-X project envisions accelerating the digital transformation of key verticals:

- Energy;
- Construction;
- Automotive;
- Manufacturing & robotics.

We are looking for : SMEs[1];

You can apply as:

- individual entity or;
- a consortium composed of two individual entities, one technology provider and one end user or two end users.

The entities have to be established in any of the EU Member States and its Overseas Countries and Territories (OCT) or Horizon Europe Associated Countries.

[1] An **SME** will be considered as such if it complies with the European Commission's Recommendation 2003/361/EC. As a summary, the criteria defining an SME are:
· Headcount in Annual Work Unit (AWU) less than 250;
· Annual turnover less or equal to €50 million OR annual balance sheet total less or equal to €43 million.
Note that the figures of partners and linked enterprises should also be considered as stated in the SME user guide. For detailed information check EU recommendation:
https://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en

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TARGET-X

GUIDE FOR APPLICANTS

TARGET-X

1st Open Call

Submission of applications starts on
the 9th of May 2023 at 13:00 Brussels Time

Submission deadline:
the 26th of July 2023 at 17:00 Brussels Time

Version: 05/05/2023

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1. Basic Info about TARGET-X

TARGET-X is a project the European Commission co-funded from the HORIZON EUROPE programme. It is coordinated by FRAUNHOFER Gesellschaft Zur Forderung Der Angewandten Forschung Ev with the participation of 14 Consortium Partners from 6 countries (see details at https://target-x.eu).

The total TARGET-X budget of cascade funding (Financial Support to Third Parties - FSTP) is €6 000 000 of which approximately €3 000 000 will be distributed under the 1st TARGET-X Open Call: Testing and development of devices/solutions.

VISION

TARGET-X 's Vision is to strengthen important economic sectors in Europe by integrating 5G and 6G, accelerating the digital transformation.

TARGET-X aims at that vision by providing testbeds for different verticals, developing new 5G/6G features, intuitive usage of 5G/6G and new business models. TARGET-X brings together information technology providers, operational technology providers and SMEs.

AMBITION

The main ambition of TARGET-X is to advance the state of the art of 5G technology with technical elements "beyond 5G", integrate those elements in testbeds operated in the project, and validate them in several use cases in four different verticals.

The fifth generation of wireless technology (5G) has arrived and is being rolled out globally. First industrial sectors such as manufacturing are testing the capabilities of 5G showing great potential for ubiquitous connectivity. With the sixth generation (6G), wireless communication will bring several industrial sectors new features, improved performance, and functional benefits.

The TARGET-X project envisions accelerating the digital transformation of key verticals:

- Energy;
- Construction;
- Automotive;
- Manufacturing & robotics.

using large-scale trials in multiple testbeds.

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Figure 1 Motivation and ambition of TARGET-X

Disruptive Technology: One key objective is the technical evolution of 5G towards 6G. In the TARGET-X project, new 5G/6G features and key enablers for 6G will be defined, implemented, and validated for the whole value chain (devices, connectivity, service delivery). Features such as localization, real-time communication, and digital twinning will be tested as prototypes in the trial sides. Enablers such as native AI/ML integration, high-performance computing, and IoT solutions will be included in the design of the 5G/6G ecosystem at each trial site. The integration of edge and cloud clusters with GPU capabilities for AI/ML or the large-scale distribution of several IoT devices will give important input towards 6G and the subsequent SNS phases.

Industrial Convergence: TARGET-X aims at large-scale testbeds for trial and pilot implementations and identification of KPIs and KVIs of the verticals. The verticals targeted in the project are energy, automotive, construction, manufacturing & robotics. With the 5G-Industry Campus Europe and the IDIADA trial site, the TARGET-X project starts with existing, fully operational 5G-infrastructures and can focus from day one on integrating new elements. Without ramp-up time, new use cases, verticals, and new features can directly be integrated, and the 5G-infrastructure can be extended by enabling technologies for 6G. Furthermore, the experiences already made at the trial sites are directly transferred to the other verticals, enabling rapid integration.

Customer Experience: To reduce the ramp-up and integration time of new 5G/6G systems and enabling technologies, TARGET-X aims at developing a self-describing network, enabling plug & play integration of new components. By evolving the 5G/6G infrastructure to a self-describing network, the integration of new hardware and software components can be done easily on all levels of the value chain.

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2. 1st Open Call - what do we offer?

The exact amount of financial support to be granted to each selected entity under the 1st TARGET-X Open Call is a fixed lump sum of up to €60 000 per entity. If you apply as a Consortium composed of 2 entities, you can get up to €120 000 (max €60 000 per entity).

NOTE! In case of for-profit companies maximum grant amount is 70% of the eligible costs needed to execute the project.

During the 1st Open Call **approximately 50 entities** will be selected.

3. Admissibility and eligibility criteria

We will check the admissibility and eligibility of all proposals submitted before the deadline (26th of July 2023 at 17:00 Brussels Time) via our online application form here: https://target-x.fundingbox.com/. The projects that do not comply with the criteria presented in this section will be excluded and marked as ineligible. We will check the admissibility and eligibility criteria based on the information provided in your application during the whole evaluation process.

3.1 Who are we looking for?

We are looking exclusively for SMEs[1]. The projects must be proposed by an individual legal entity or micro-consortium of 2 SMEs (consortium must be composed of one entity acting as technology provider and one entity acting as end-user **or** both entities acting as end users), registered prior to the launch of the TARGET-X 1st Open Call (9th of May 2023).

The entities have to be established in any of the:

- The Member States of the European Union[2] and its Overseas Countries and Territories (OCT) or;
- Associated Countries (AC)[3] to Horizon Europe.

Consortium members applying for this Open Call cannot be entities related by capital.

[1] An **SME** will be considered as such if it complies with the European Commission's Recommendation 2003/361/EC. As a summary, the criteria defining an SME are:
• Headcount in Annual Work Unit (AWU) less than 250;
• Annual turnover less or equal to €50 million OR annual balance sheet total less or equal to €43 million.
Note that the figures of partners and linked enterprises should also be considered as stated in the SME user guide. For detailed information check the EU recommendation:
https://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_en

[2] Following the Council Implementing Decision (EU) 2022/2506, as of 16th December 2022, no legal commitments can be signed with Hungarian public interest trusts established under Hungarian Act IX of 2021 or any entity they maintain. Affected entities may continue to apply to calls for proposals. However, in case the Council measures are not lifted, such entities are not eligible to participate in the TARGET-X 1st open call. In case of consortium, co-applicants will be invited to remove or replace that entity. Tasks and budget may be redistributed accordingly.

[3] **AC as of (14.04.2023):** Albania, Armenia, Bosnia and Herzegovina, Faroe Islands, Georgia, Iceland, Israel, Kosovo, Moldova, Montenegro, North Macedonia, Norway, Serbia, Türkiye, Tunisia, Ukraine, for the most up-to-date list please first part of this document.

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The applicants who are subject to EU restrictive measures under Article 29 of the Treaty on the European Union (TEU) and Article 215 of the Treaty on the Functioning of the EU (TFEU)4 are not eligible to participate in this open call.

The TARGET-X Partners are not eligible to act as applicants and CANNOT be involved in the grantees' projects, neither their affiliates nor employees or permanent collaborators.

3.2 What types of activities can be funded?

The proposed activities must:

1. address Performance testing or development of devices or solutions oriented to technology providers and use cases applicable to only **one** topic in one of the following verticals: Manufacturing, Energy, Automotive, Construction and other topics for the development of new devices/ solutions and other topics for evaluation with KPI&KVI-based methodological assessment framework. For more details please check available in Annex 1 and our website;
2. aim to reach Technology Readiness Level (TRL) 7 during the Support Programme, starting from TRL 3-4, preferably. TARGET-X counts on the participation of European innovative SMEs with a clear commercial ambition and a potential for high growth and internationalisation.

The results obtained by the selected projects will be integrated into the TARGET-X project's repository. The technology developed by the projects must be available in Open-Source Code and with open interfaces for further reutilisation in the subsequent phase (i.e. beneficiaries of the 2nd TARGET-X Open Call). More details on Access Rights will be included in the SubGrant Agreement.

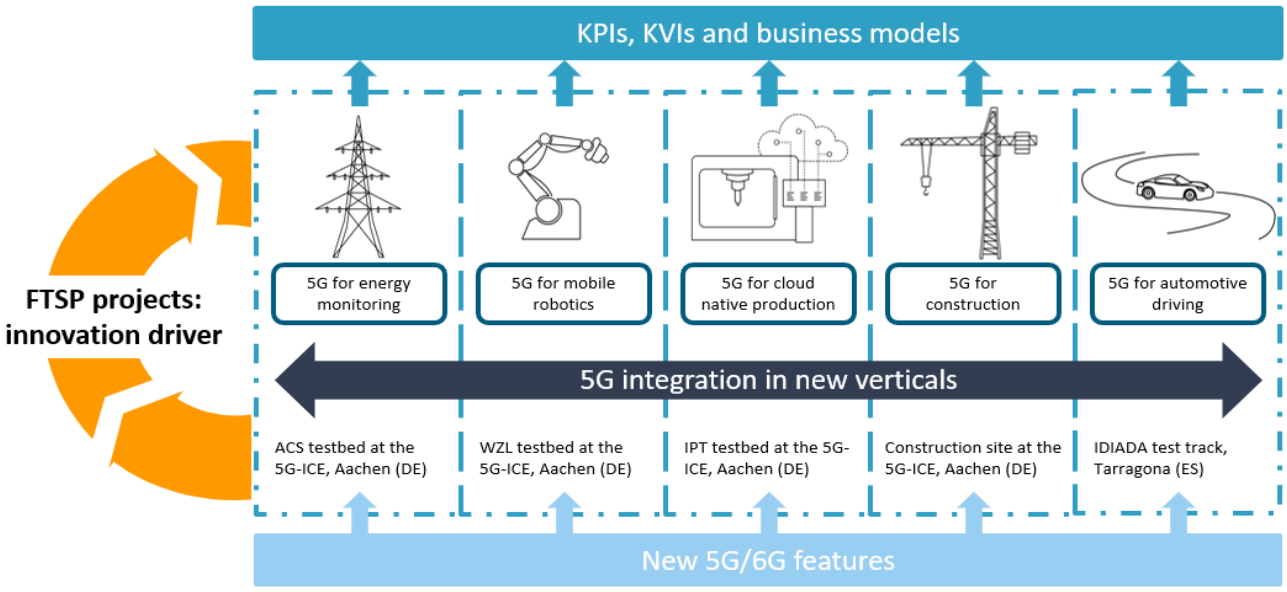

Figure 2 Overall concept of TARGET-X

[4] Please note that the EU Official Journal contains the official list and, in case of conflict, its content prevails over that of the EU Sanctions Map.

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3.3 How to apply?

Proposals must be submitted through the TARGET-X Open Call microsite:

https://target-x.fundingbox.com/

- **Be on time and use our system**
  Make sure you submit your proposal through the online form before the deadline on the 26th of July 2023 at 17:00 Brussels Time (admissibility criteria). If you submit the form correctly, the system will send you a confirmation of your submission. Get in touch with us if it is not the case. We will not be evaluating any proposal sent after the deadline and submitted outside the dedicated form.

- **English Language**
  Your proposal must be written in English in all mandatory parts in order to be eligible. Only parts written in English will be evaluated. If the mandatory parts of the proposal are in any other language, the entire proposal will be rejected (admissibility criterion).

- **Every question deserves your attention**
  All mandatory sections of your proposal - generally marked with an asterisk - must be completed (admissibility criterion). The data provided should be actual, true, and complete and should allow assessment of the proposal. Additional material, not specifically requested in the online application form, will **not** be considered for the evaluation.

- **European dimension**
  Your proposal should have a clear European Dimension (fostering the projects that generate a substantial positive impact for European citizens).

- **Be exhaustive & precise**
  You have to verify the completeness of the form, as it won't be possible to add any further information after the deadline. After the proposal is submitted, you will be able to modify the form until the deadline.

- **Multiple submissions?**
  Though applicants can submit multiple applications, each team member or any legal entity can be funded only once per TARGET-X Open Call. If several selected proposals in one TARGET-X Open call have the same team member(s) and/or the same organisation(s), it is only the proposal with the highest number of points that will be funded.

- **Absence of conflict of interest**
  We will take into consideration the existence of the potential conflict of interest between you and one or more TARGET-X Consortium Partners. Indeed, the Consortium Partners, their affiliated entities, employees, and permanent collaborators cannot take part in the TARGET-X support programme. All cases of potential conflict of interest will be assessed on a case-by-case basis.

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- **It is your proposal**
  Your project should be based on your original work, if the project is not based on your original work, your right to use the IPR must be clearly defined (you must have a licence agreement or the IPR (Intellectual Property Rights) must be transferred to you from somebody who created the work). In particular, any work related to the implementation of the project described in the application may not violate the IPR of third parties, and the IPR to the application project may not be the subject of a dispute or proceedings for infringement of third party IPR.

- **Healthy finances and a clean sheet are a must**
  We don't accept entities that are under liquidation or enterprises in difficulty according to Commission Regulation No 651/2014, art. 2.18. Neither will we accept proposals from entities that are excluded from the possibility of obtaining EU funding under the provisions of both national and EU law or by a decision of both national or EU authorities. We also don't accept entities that are meeting national regulations regarding bankruptcy.

- **Acceptance of the open-call rules**
  To apply for this Open Call you have to accept its rules and regulations detailed in this Guide for Applicants.

- **Limit on the FSTP**
  As a beneficiary, you cannot receive more than €60 000 per entity taking into consideration one TARGET-X Open Call.

TARGET-X is planning a certain number of online webinars about this Open Call. They will be announced at the TARGET-X Open Call microsite and Community Space.

4. How will we evaluate your proposal?

Our evaluation process is transparent, fair and equal to all our participants. We will evaluate the projects in a few phases. For this call, we are looking for the best fit for our project and we expect a high number of applications. Since we are much more concerned with quality than quantity, we suggest putting more effort into the project's presentation, providing as much detail as possible.

4.1 Step 1: Admissibility and Eligibility Check

Once the Open Call is closed, we will check whether the proposals meet the admissibility and eligibility conditions set up in section 3. We will do it on the basis of the statements included in the proposals.
At this stage, the eligibility criteria are checked against a Declaration of Honour or self-declarations included in the application form. Later on, the above criteria will be verified during the whole evaluation process (including the final formal check).
The projects that do not comply with these criteria will be rejected. As a result of the checking, an 'List of Eligible Applications' will be produced.

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4.2 Step 2: In/Out Scope Screening

The In/Out Scope Screening will be done by the 'Selection Committee' members (TARGET- X Consortium Partners).

The 'Selection Committee' will review the proposal in terms of the general objectives of all proposals assessing the following aspects:

- Scope. The objectives of the proposal must fit within the scope of the project;
- European Dimension. The project should have a European dimension;

The 'Selection Committee' members will provide reasoning in the cases where no compliance evidence is found.

Be aware that proposals that do not comply with any of the aspects described above will be rejected. The ones complying with all of them will move on to the experts' independent individual evaluation phase.

We will inform the applicants about the results of the admissibility and eligibility check and the IN/OUT SCOPE SCREENING.

4.3 Step 3: Independent Individual Evaluation

Independent Individual Evaluation will be done for all 'In Scope' proposals.

In this phase, each project will be evaluated by two Independent Experts. They will be appointed according to the specific characteristics of the applicants from the pool of External Experts.

The projects will be evaluated within the following awarding criteria:

(1). EXCELLENCE will evaluate:

- **Ambition.** The applicants have to demonstrate to what extent the proposed third party project contributes to the project scope, have an European dimension and are beyond the State of the Art. The third party project has to describe the innovative approach behind it (e.g. ground-breaking objectives, novel concepts and approaches, new products, services or business and organisational models);
- **Innovation.** The applicants should provide information about the level of innovation within their market and about the degree of differentiation that this project will bring;
- **Soundness of the approach** and credibility of the proposed methodology.

(2). IMPACT will analyse:

- **Market opportunity**. The applicants have to demonstrate a clear idea of what they want to do and whether the new/improved product has market potential, e.g. because it solves a problem for a specific target customer.

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- **Competition.** The applicants have to provide information about the degree of competition for their particular product/service and if the idea is disruptive and breaks the market. i.e. the products/services to be brought to market can be clearly differentiated from the competition.
- **Commercial Strategy and Scalability.** The applicants have to demonstrate the level of scalability of the new/improved product meaning by not addressing a specific problem but able to be commercialised to solve a structural problem in a specific sector/process/etc.
- **Environmental and social impact.** The applicants have to demonstrate the project contribution towards environmental, social and economic impacts to contribute to sustainable development, Green Deal and other European policies.

(3). IMPLEMENTATION will consider:

- **Team.** The applicants have to demonstrate their management and leadership qualities, their ability to take a concept from ideas to market, and their capacity to carry through their ideas and understand the dynamics of the market they are trying to tap into. The team should be a cross-functional team, with a strong background and skills base and taking into account its gender balance (at all levels of personnel assigned to the action, including at the supervisory and managerial levels); the team should take all reasonable measures to promote equal opportunities between men and women in the implementation of the action..
- **Resources.** Demonstrate the quality and effectiveness of the resources assigned in order to get the objectives/deliverables proposed. In the case of for-profit entities, the compromise of 30% self-financing of activities should be secured by each for-profit entities.

The evaluators will score each criterion on a scale from 0 to 5:

0 = Proposal fails to address the criterion or cannot be assessed due to missing or incomplete information
1 = Poor – criterion is inadequately addressed or there are serious inherent weaknesses
2 = Fair – proposal broadly addresses the criterion, but there are significant weaknesses
3 = Good – proposal addresses the criterion well, but a number of shortcomings are present
4 = Very good – proposal addresses the criterion very well, but a small number of shortcomings are present
5 = Excellent – proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.

Each evaluator will produce an **'Individual Evaluation Report'**. The final score for each individual criteria will be calculated as an average of the scores' provided by each evaluator.

If scores on a project show significant divergence between the two reviewers, a third external reviewer will be involved to provide an additional independent assessment of this proposal.

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The final score per application will be calculated as the sum of the score for each individual criteria. The threshold for individual criteria will be 3. The overall threshold, applying to the sum of the three individual scores, is 10 points.

4.4. Step 4 Evaluation Consensus Group

After carrying out the 'Independent Individual Evaluation', experts who have evaluated the proposals will join a Consensus Group, to agree on a common position, including comments and scores for all evaluated proposals.

The Consensus Group will specially discuss the cases where there is a significant divergence between the evaluators' scoring. In case no consensus is reached between the evaluators, an additional evaluator will be included to provide an extra evaluation.

In case of ties, the following criteria will be used to rank the projects, in order:

- The highest score in the Impact Section;
- Gender balance among the personnel responsible for carrying out the activities.

As a result of the Independent Evaluation, a 'Ranking List' will be produced.

All proposals obtaining a score above the threshold will pass to the next phase. Please note that we need time to process through all the proposals in this phase, so you probably won't hear back from us for a while.

4.5 Step 5 Consensus Meeting

The 'Selection Committee' and two external experts and the external ethics expert will decide, by Consensus, the 'Provisional List of FSTP recipients' and a 'Reserve List'.

The decision will be based on the 'Ranking List' obtained as a result of the previous step. 'Selection Committee' will make sure (in order to ensure a balanced portfolio of supported activities in the different Verticals) that at least the highest ranked proposal per vertical will be funded provided that it attains all thresholds.

Whilst normally the highest ranked proposals will be selected for funding, the 'Selection Committee' might have fair reasons for objecting to a specific third party project, like the alignment with TARGET-X goals and scope, the ability to achieve the highest impact possible, commercial competition, as well as the existence of significant ethical concerns or a potential conflict of interest. In this case, the choice may pass to the next-ranked proposal.

The exact number of proposals approved will be decided based on the overall quality of the proposals.

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4.6 Step 6 Ethics Review

The 'Ethics Review' will be done for all selected proposals, considering possible scenarios with ethics issues.
These will be mainly related to the handling of Private Data:

- Person-related data: camera surveillance, image processing in the context of manufacturing, construction and automotive;
- Industrial data: industrial data generally need specific protection;
- Artificial intelligence: no specific developments of AI are expected, but some tools for human-robot collaboration could deploy AI tools.

5. What's next? SubGrant Agreement Preparation and Signature

Before the beneficiary gets started with the TARGET-X programme, they need to sign the SubGrant Agreement with the TARGET-X Consortium. In the case of consortia, the SGA will be signed by each third party.

Prior to signing the SubGrant Agreement, you should provide documents regarding your formal status. The TARGET-X Consortium will verify them, to prove your eligibility (for the details please check our 'Frequently Asked Questions'). Please do it within the deadlines that will be communicated to you.

Be extremely vigilant with respect to:

1. **The nature of the documents we request.**
   If the documents you provide do not prove your eligibility, the process will end here for you.
2. **The deadlines that we will give you to hand us these documents.**
   If you do not deliver the requested documents on time, without a clear and reasonable justification, we will have to exclude you from further formal assessment. Another applicant from the 'Reserve List 'will then replace you.

6. Our Support Programme and Payment Arrangements

Once your eligibility has been confirmed following the formal check and the SubGrant Agreement signed, you will become an official beneficiary of the TARGET-X Programme.

As a selected grantee, you will receive a fixed lump sum of up to €60 000 (for a single applicant) or up to €120 000 (for a micro-consortium of 2 applicants, but no more than €60 000 per entity). The Support Programme will last 7 months.

NOTE! When you apply as a micro-consortium, your application form must include information on how the grant will be distributed between consortium members.

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The lump sum is a simplified method of settling expenses in projects financed from Horizon Europe funds. It means that you as a beneficiary are not required to present strictly defined accounting documents to prove the cost incurred (e.g. invoices).

However, you are obliged to demonstrate the implementation of the project in line with the milestones set for it. Simply speaking it means that we will carefully assess your progress and the quality of your work during Interim Reviews, not your accountancy.

The milestones (deliverables, KPIs and ethical recommendations) will be fixed in the **'Individual Mentoring Plan'** elaborated at the beginning of the programme.

The lump sum does not release you from the obligation to collect documentation to confirm the costs under fiscal regulation.

6.1 Payment Arrangements

For the sake of simplicity and transparency, the Financial Support will be paid against the achievement of certain milestones or KPIs (which will be included in the 'Individual Mentoring Plan' annexed to the SGA and based on the results of the Milestone Reviews). As a beneficiary, you will receive funding as follows:

Payment Milestones	Deliverable	Delivery Date	Payment Milestone (instalments)
Stage 1	'Individual Mentoring Plan'	M1	Up to 5 000 EUR
Stage 2	Project development report	M3	Up to 35 000 EUR
Stage 3	Market uptake report	M7	Up to 20 000 EUR
TOTAL			**UP TO 60 000 EUR**

Table 1 Payment Milestones

Milestone review process

A Milestone Review will be organised in each payment milestone established at the project level, namely:

- 1st Milestone Review: Individual Mentoring Plan;
- 2nd Milestone Review: Interim progress review;
- 3rd Milestone Review: Final review.

The evaluation of the third party projects' performance at the 'Milestone Review' will be done by the mentors assigned to each project and, if specified in the Individual Mentoring Plan, also by the ethics expert.

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The evaluation will be done based on the following criteria:

- Deliverable quality (30%);
- Technical performance indicators (60%);
- Deadline Compliance (10%).

Each criterion will be scored from 0 to 10 and, based on the weight of each criteria, the final score will be calculated. The threshold to continue in the programme is 7 points.
The 'Selection Committee' will review and validate the evaluations from mentors, putting special attention to the 'under threshold' cases, if any, by taking into consideration all possible objective reasons for underperformance (i.e. external factors which might have influenced the beneficiaries' performance). The 'Selection Committee' will take the final decision, and approve the payments or invite third party projects which have not reached the threshold to leave the programme.

A delayed payment mechanism might be applied to the payments. The final payment (up to 15% of the total grant amount awarded to one beneficiary) might be done after the TARGET-X project ends (which is 30.06.2025). In the case of for-profit legal entities, the grant cannot exceed 70% of the costs estimated for the execution of the project.

7. Contact us

How can we help you?
If you have extra questions regarding our Open Call process, you can post your questions at:

- ✓ Ask your question in the HELPDESK.
- ✓ Send us an email to the following address: contact.target-x@ipt.fraunhofer.de.

In case of any technical issues or problems, please include the following information in your message:

- ✓ Your username, telephone number and your email address;
- ✓ The details of the specific problem (error messages that appeared, bug descriptions such as a dropdown list that isn't working, etc.);
- ✓ Screenshots of the problem.

Complaints

If, after receiving the results of one of the evaluation phases (when foreseen), you consider that a mistake has been made, you can send us your complaint. To do so please send us your complaint in English by email to contact.target-x@ipt.fraunhofer.de, including the following information:

- ✓ Your contact details (including email address);
- ✓ The subject of the complaint;
- ✓ Information and evidence regarding the alleged mistake.

Important note regarding the timeline:

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You have **3 calendar days** to submit your complaint starting from the day after the communication was sent. On our side, we will review them within no more than 14 calendar days from its reception.

If we need more time to assess your complaint, we will inform you by email about the extension.
We will not review anonymous complaints as well as complaints with incomplete information.

Please take into account that the evaluation is run by experts in the field, and we do not interfere with their assessment, therefore we will not evaluate complaints related to the results of the evaluation other than related to the mistakes in the evaluation of the eligibility criteria.

8. Last but not least - final provisions

Any matters not covered by this Guide will be governed by Polish law and rules related to the Horizon Europe programme and European Union grants regulations.

Please take into account that we make our best effort to keep all provided data confidential; however, for the avoidance of doubt, you are solely responsible to indicate your confidential information as such.

Your IPR will remain your property. Further contracts may be needed in case of IPR generated from work carried out jointly by you and one or more TARGET-X Partners. TARGET-X project has received funding under the Smart Networks and Services Joint Undertaking (hereinafter **SNS JU**) actions and therefore may undergo additional requirements when it comes to granting access rights of the TARGET-X funded project results to the TARGET-X consortium partners, SNS JU members and contributing partners and the European Commission. The additional requirements for the access rights to results include but are not limited to: Access for Key Performance Indicators (KPI) and Key Value Indicators (KVI) evaluation, data generated within the TARGET-X funded project, access to results of the TARGET-X funded project, Open-source energy data anonymized for further scientific use.

Please note that TARGET-X beneficiaries must enable a potential assessment of their project based on a methodological assessment framework that is being developed as part of TARGET-X. The framework is currently being developed to evaluate implemented 5G use cases and assess their technical, economic and societal impact. Key Performance Indicators (KPIs) and Key Value Indicators (KVIs) are defined for the assessment to make the impact of 5G use cases measurable in a variety of categories. Examples of assessment include calculating the return on investment (RoI) of 5G use cases or calculating the greenhouse gas reduction potential from the use of 5G, etc.

For the selected beneficiaries, the SubGrant Agreement will include a set of obligations towards the European Commission (for example: promoting the project and giving visibility to the EU funding, maintaining confidentiality, IPR, understanding potential controls by the EC/ECA, EPPO and OLAF).

The TARGET-X Consortium might cancel the call at any time, change its provisions or extend it. In such a case we will inform all applicants about such change. The signature of the SubGrant Agreement is an initial

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condition to establish any obligations among applicants and any X-Target Consortium Partners (with respect to the obligation of confidentiality of the application).
You didn't find what you were looking for? You may want to check our 'Frequently Asked Questions' section.

9. Extra hints before submitting your proposal

A proposal takes time and effort and we know it. Here are a few crucial points you should read before submitting your proposal in order to maximise your chances of success:

- ✓ Is your project in line with what TARGET-X is looking for? Not 100% sure? You can consult this section 3.2 as well as the website.
- ✓ Did you present your project in a way that will convince evaluators? Not sure if you did? Go back to section 4.3 if you have any doubts.
- ✓ Is your project fulfilling all the admissibility and eligibility requirements described in the Guide for Applicants? Check again section 3.
- ✓ Are you sure you are able to cope with our process of the SubGrant Agreement signature and payment arrangements for selected proposals? You may want to go over this section.
- ✓ Did you check our SubGrant Agreement Template? You didn't? Check it out here.
- ✓ Do you need extra help? Get in touch!

You can read our R.E.C.I.P.E. for an outstanding European Funding Opportunity application for additional advice. Good luck!

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TARGET-X

Annex 1

Topics description

TARGET-X

LIST OF TOPICS FOR THE

1st TARGET- X OPEN CALL

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METHODOLOGICAL ASSESSMENT FRAMEWORK

Title: 1_Technical and economical assessment of industrial 5G use cases

Summary	As part of the TARGET-X project, different 5G use cases from the verticals manufacturing, energy, construction, automotive will be concepted and implemented. To gain insight into these 5G use cases, a systematic approach is required, enabling the technical and economical assessment based on key performance indicators (KPI).
Scope	The selection of existing or definition of new KPI is necessary to provide the theoretical foundation of the methodological assessment framework. Furthermore, data modeling for the assessment is required to enable a data-driven approach.
Objectives	Selection of existing or derivation of new KPIs for the assessment of industrial 5G use cases. Building a data model for the technical and economical assessment of industrial 5G use cases.
Description of the ideal candidate	An ideal candidate is an SME focusing on the technology assessment of industrial use cases enabled by wireless communication, e.g., as part of a digital service portfolio.

Title: 2_Societal assessment of industrial 5G use cases focusing on ecological sustainability

Summary	As part of the TARGET-X project, different 5G use cases from the verticals manufacturing, energy, construction, automotive will be concepted and implemented. To gain insight into these 5G use cases, a systematic approach is required, enabling the sustainability assessment based on key value indicators (KVI)
Scope	The selection of existing or definition of new KVI is necessary to provide the theoretical foundation of the methodological assessment framework. Furthermore, data modeling for the assessment is required to enable a data-driven approach
Objectives	Selection of existing or derivation of new KVIs for the sustainability assessment of industrial 5G use cases. Building a data model for the sustainability assessment of industrial 5G use cases

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MANUFACTURING | 5G ENABLED ENERGY SENSOR

Title: 3_Development of 5G enabled Energy sensors to monitor distributed energy usage

Summary	The current political and environmental scenario on energy prices and carbon emissions enforces many industries to reduce their energy footprint as little as possible. This requires forming an energy policy to monitor energy usage of the appliances, machinery, and power grid for possible reduced usage. Achieve this requires energy sensors integrated into these areas and monitoring the various parameters about power consumption such as power consumption, power factor, efficiency, etc. These parameters need to be monitored in real-time, integrated directly into the power distribution lines of machines, industries, and homes, and require sending data in real-time wirelessly for seamless integration to the framework without adding additional costs. For this, a 5G-enabled energy meter needs to be developed. This energy meter should provide a measurement of energy-related parameters such as voltage and current for various industries and be scalable for other applications. The meter should also provide enhanced calculation of additional parameters such as Apparent power and power factor and provides an interface with a 5G device to send the processed data. We are seeking proposals from experienced developers with a proven track record in developing embedded hardware solutions for manufacturing environments. The proposed solution should be scalable, flexible, and compatible with a range of communication protocols and standards. It should also be secure, reliable, and easy to use. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, eco-nomic and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	• Development of 5G Energy meter hardware platform with Microcontrollers, power sensors (AC/DC) and interface for 5G/6G device; • Software for performing data processing of energy parameters; • Validating based on a real shopfloor located in Aachen.
Objectives	• First implementation of an energy meter with ethernet to calculate power consumption of machines with Current/voltage sensors; • Development of software for data processing, protocols for transmission.

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Title: 4_Configuring, managing and measuring a TSN converged network

Summary	Time-Sensitive Networking (TSN) has become an essential solution for deterministic communication in industrial applications. As the number of devices in TSN converged networks increases, managing and optimizing network performance has become more complex. With the advent of 5G networks, the TSN converged network environment is evolving to include wireless devices. This open call aims to focus on the implementation of a centralized network controller for TSN converged networks that includes 5G networks. We welcome submissions that address the implementation of a centralized network controller for TSN converged networks, including 5G-bridges. The submissions may focus on, but are not limited to, the following topics: • Architecture and design of a centralized network controller for TSN converged networks that include 5G networks; • Network management and optimization through a centralized network controller for TSN converged networks that include 5G networks; • Integration of wireless connections, modeled as delayed cable or corresponding to Release 16 specifications ; • Implementation challenges and solutions for a centralized network controller in TSN converged networks that include 5G networks. Use cases and applications of a centralized network controller for TSN converged networks that include 5G networks. We encourage submissions from industry practitioners and engineers who have hands-on experience with implementing centralized network controllers in TSN converged networks that include 5G networks. The submissions should focus on practical implementation experiences rather than theoretical research papers or case studies.
Scope	• Definition of different concepts how to integrate a 5G-bridge in a Centralized Network Controller (CNC); • Implementation of a prototype of such a CNC; • Definition of different concepts how to define a Centralized User Configuration (CUC); • Implementation of a prototype of such a CUC; • Validation on a real production shopfloor located in Aachen in a TSN-network.
Objectives	• First implementation of a CNC and CUC capable of handling 5G-bridges; • Successful validation in a real test environment.

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MANUFACTURING | EDGE ROBOTICS

Title: 5_Wearable robotics

Summary	A wearable robot is a specific type of robot capable of reducing the physical load on the human worker. They help, give support and assistance to workers performing demanding manual activities. For instance, an occupation skeleton (OE) can reduce the physical pressure on the human worker. In order to secure smooth interworking of wearable robots and humans, demanding requirements are placed on computation and hardware. A wearable robotics use case relies on computational offloading capabilities and require a deterministic communication performance. Computational offloading is required to improve energy efficiency, costs and accelerate adoption across various industries, especially in manufacturing. The offloading requires highly precise and deterministic communication performance as unpredictable latency variations could directly jeopardize the operations of such applications. Therefore, this project is aimed to third parties developing and implementing a wearable robotics solution using 5G systems. The third party is expected to present and develop a wearable robotics use case in a real industrial shopfloor along with testing and doing an over-the-air performance analysis. The project can be divided into four phases: planning and network connectivity, measurements campaign, analysis/evaluation of experiments and presentation of key findings. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	• Realization of wearable robotics use case; • Leveraging from wireless communication techniques for reliability, low and deterministic latency; • Network requirements and performance evaluation of the wearable robotics use case; • KPI-based.
Objectives	• Successfully testing a wearable robotics use case in a real industrial environment; • Understanding and analysis of network requirements for wearable robotics use case; • Add-on: proposal of a joint publication based on key findings and results obtained during the open call.

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Title: 6_Soft PLC for Safety Critical Automation

Summary	This project proposes the development of a virtualized programmable logic controller (PLC) system utilizing edge cloud infrastructure to enable AI-driven methods in safety-critical robot applications (e.g., person recognition in navigation of autonomous mobile robots). PLCs are commonly used for automation with real-time requirements, particularly for safety applications. However, testing new methods for safety-critical applications carries a high level of risk due to the lack of standardization. Beyond 5G technologies are capable of technically fulfilling real-time requirements, providing an opportunity to utilize them for safety-critical applications. The project will consist of four main phases: Soft PLC development, testing framework, integration of AI-driven safety features, and performance evaluation tests. The expected results of this project include a framework for deploying soft PLC on a edge cluster infrastructure. The project provides a scalable and cost-effective solution for safety-critical applications, particularly in unexpected events. The integration of AI-driven safety features into the soft PLC will improve safety and performance, providing a more reliable solution for safety-critical applications. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	• Realization of robotics use case with soft PLCs; • Utilizing AI-techniques for safety use case (e.g. person recognition within AMR navigation); • Deploying the robot control to edge cluster and running wire-less communication; • KPI-based 5G use case evaluation.
Objectives	• Successfully execute robotics use case with safety application; • Virtualization of PLC for robot safety control on edge cluster; • Successfully testing AI-technology for safety-critical applications (in the lab).

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Title: 7_Robotic Assembly of Flexible Components

Summary	This project proposes the development of an AI-driven mobile manipulator that can manipulate flexible components for the e-mobility industry. With the growing relevance of e-mobility components, such as batteries and electric motors, the challenge of manipulating flexible components becomes an even more important challenge. To achieve economic success of e-mobility, new automation techniques are required to improve the efficiency of component manipulation. The project will consist of four main phases: Design and development, AI-driven control system, wire-less communication, and manipulation execution evaluation. The mobile manipulator will be equipped with sensors to collect real-time data about the environment and utilize machine learning algorithms to analyze and interpret the environment to make decisions about the manipulation of flexible components. The use of wire-less communication and edge computing infrastructure will enable the deployment of AI-driven techniques to mobile manipulators, improving their processing power and reducing latency. The expected results include a mobile manipulator that can move autonomously and manipulate flexible components with precision, an AI-driven control system, integration of wire-less communication, and improved efficiency and accuracy of component manipulation in the e-mobility industry. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	• Realization of robotics use case for assembling electronic cables; • Utilizing AI-techniques for robotic path planning; • Deploying the robot control to edge cluster and running wire-less communication; • KPI-based 5G use case evaluation.
Objectives	• Successfully plug in cables in battery automotive assembly use-case; • Virtualization of robot control on edge cluster; • Achieving high product flexibility with the given edge robotics setup.

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Title: 8_Machine-vision based disassembly path planning for end-of-life lithium-ion battery packs

Summary	This project proposes a solution for automatic disassembly of end-of-life lithium-ion batteries, which are valuable components containing rare materials. Disassembling these batteries for recycling or remanufacturing is crucial to reduce environmental impact and conserve resources. However, handling high product variety and multiple lifecycles of generations poses a challenge. The project will utilize learning from demonstration by vision-based approaches to overcome the challenge of robot path planning for automatic disassembly. Edge cloud infrastructure will be utilized for learning and deployment to various heterogeneous robots. Beyond 5G communication is necessary for mobile manipulation and edge cluster infrastructure. The project will consist of three main phases: vision-based learning from demonstration, integration with edge cloud infrastructure, and testing and evaluation. The expected results of this project include a vision-based learning from demonstration system for automatic disassembly of end-of-life lithium-ion batteries. By utilizing beyond 5G communication and edge cloud infrastructure, the project provides a scalable and cost-effective solution for automatic disassembly of end-of-life lithium-ion batteries, contributing to a more sustainable future. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	• Realization of robotics use case with for automatic disassembly of lithium-ion batteries; • Utilizing AI-based learning by demonstration techniques for path planning; • Deploying the robot control to edge cluster and running wire-less communication; • KPI-based 5G use case evaluation.
Objectives	• Successfully execute robotics use case for automatic battery disassembly; • Virtualization of robot control on edge cluster; • Successfully testing AI-technology for learning by demonstration.

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MANUFACTURING | DIGITAL TWIN

Title: 9_Software Stack for different fieldbus protocols such as CC-Link IE TSN, EtherCat, ProfiNet

Summary	As the world continues to move towards digitalization, the demand for virtualized fieldbus protocol masters and local stations is increasing rapidly. Such fieldbus protocols are for example CC-Link IE TSN, EtherCat or PROFINET. These masters and local stations are used in industrial production to allow communication between various devices and systems. By virtualizing them, companies can reduce their hardware costs, simplify their system architecture, and enable better scalability. Running these virtualized masters and local stations on Linux operating systems provides numerous advantages. First and foremost, Linux is a free and open-source operating system that is widely used in industrial automation. By using Linux, developers can reduce licensing costs and take advantage of the vast community support available for the platform. Another advantage of virtualized fieldbus protocol masters and local stations running on Linux is their ease of deployment. With virtualization, companies can easily deploy new instances of masters and local stations as needed, without the need for additional hardware. This can lead to significant cost savings, particularly for large-scale industrial applications. We are seeking proposals from experienced developers with a proven track record in developing masters and local stations for fieldbus protocols. The focus of the call the implementation of virtualized, hardware independent master and local stations for CC-Link IE TSN networks, further additional fieldbus protocols are welcome. The resulting software should be deployable on various Linux distributions. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	• Implementation of a hardware independent CC-Link IE TSN master and local station deployable on Linux; • Implementation of a user interface for configuration and interaction; • Validation on a real production shopfloor located in Aachen in a TSN-network; • Further fieldbus protocols can also be implemented; • KPI-based 5G use case evaluation.
Objectives	• First implementation of a virtual fieldbus protocol; • Successful communication between different Linux devices via fieldbus protocols.

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Title: 10_Developing a digital twin of the machines and sensors with Asset Administration Shell (AAS)

Summary	As In order to maintain an automated management of the assets and efficient configuration of the machines at the factory floor, we can benefit from the concept of digital twins. By representing the machines, robots, sensors etc. in the digital world, process automation and production efficiency can be maintained. However, to reveal the full potential of digital twin technology in a factory floor where machines from different vendors cooperate, there is a requirement of interoperability. Asset Administration Shell (AAS) is a framework to develop digital twins of the Industry 4.0 assets. AAS is an enabler of automated network and asset management at the factory floor. By exposing dynamic (e.g., sensory data) as well as static (e.g., machine capabilities and properties) data exposed by the machine itself, AAS can store and utilize this information for management purposes. However, collecting/exposing data from the device (e.g., machine, robot, sensor) is vendor dependent and it is a challenging process. In order to design and develop AAS of the factory devices (with 5G UE), we need to understand how the device works and the ways of exposing relevant data continuously to store in AAS. This topic aims to develop AAS of the factory devices available in the testbed environments. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	• Collecting/exposing the relevant data from the machines, sensors, devices; • Designing the internals of digital twin in form of AAS (e.g., submodel definitions); • Developing device AAS for different machines and sensors, representing the real-world assets.
Objectives	• First implementation of the machine AAS instances • Successful interaction among different AAS instances

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Title: 11_Developing an asset management tool for factory shopfloors based on Asset Administration Shell (AAS)

Summary	To enable the digital representation of physical assets, facilitating real-time monitoring and predictive maintenance, the Asset Administration Shell (AAS) has been introduced to the factory shopfloor. It enhances communication and collaboration among devices, machines, and systems, leading to increased efficiency, reduced downtime, and improved maintenance processes. To manage and orchestrate the growing amount of individual assets in production, a plant asset management tool is to be developed for the digital twins on the factory floor. This tool will generate a high-level digital representation of our physical assets and enable seamless communication and collaboration between machines, devices, and systems in the plant using the AAS. It will help in scheduling, assigning work orders, and tracking asset utilization at a high-level for the shopfloor. The AAS will also enable the creation of digital twins of our assets, which can be used for simulation and predictive maintenance. We are seeking proposals from experienced developers with a proven track record in developing AAS solutions for manufacturing environments. The proposed solution should be scalable, flexible, and compatible with a range of communication protocols and standards. It should also be secure, reliable, and easy to use. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, eco-nomic and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	• Implementation of an orchestration and management tool for AASs in a factory shopfloor; • Design of a user interface for monitoring, creating, deleting and interacting with the AASs; • Validating based on a real shopfloor located in Aachen; • Designing interfaces for future data flows between devices, communication network, localization system.
Objectives	• First implementation of a plant asset management tool, based on AASs; • Digital representation of the assets in an actual shopfloor and their communication pattern.

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Title: 12_Development of new sensor modules for the tracking box

Summary	To enable intelligent handling and real-time monitoring of physical resources, it is necessary to integrate a smart tracking device that utilizes wireless sensors and GPS/GNSS technology for location tracking. While this solution is suitable for outdoor settings, it may not be the best option for tracking resources indoors. However, the latest 5G and 6G technologies can offer improved positioning accuracy and additional sensor options such as Inertial Measurement Units and Gyroscopes. By combining sensor and device data, this platform can provide precise location information that enables remote tracking. We're seeking proposals from experienced developers who have successfully designed embedded hardware solutions for manufacturing environments. The solution should be versatile, secure, and reliable while also being scalable and compatible with various communication protocols and standards. Additionally, it should be user-friendly and easy to implement. The TARGET-X project includes a methodological assessment framework that evaluates the technical, economic, and social impact of 5G use cases. To ensure a comprehensive assessment of as many 5G use cases as possible, the framework can also be applied to projects funded by the TARGET-X cascaded funding initiative.
Scope	• Development of wireless hardware platform with Microcontroller IMUs and interface for 5G/6G device; • Software for performing data acquisition, sensor fusion to get positioning information; • Validating based on a real shopfloor located in Aachen.
Objectives	• First implementation of a Sensor platform with microcontroller, IMUs and Ethernet peripherals; • Development of software for data acquisition, protocols to transmit data.

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ENERGY

Title: 13_Edge power data analytics

Summary	The goal is to integrate different monitoring solutions and data analytics technologies on edge cloud or edge devices, based on the 5G design principles. This will include algorithms for energy consumption forecasting and analytics based on provided measurement data or third-party measurement data.
Scope	The energy consumption is a valuable factor for the energy transition. The knowledge and awareness is a very important first step towards the reduction of the consumption. To achieve that, forecasting of consumption and measurement data analytics can give additional insights.
Objectives	The objective is to provide power consumption insights by utilizing data analytical methods to edge devices or on the edge servers. To successfully integrate, monitor and visualise the power consumption data from edge devices and run predictive maintenance methods.
Description of the ideal candidate	The ideal candidate would have knowledge of the power grid as well as the topics of big data analytics and mobile network applications.

Title: 14_Distributed monitoring solutions

Summary	The deployment of monitoring and metering solutions is a key element in the clean energy transition, as well as for increasing the energy awareness. The integration of different types of devices and vendors could be challenging. The goal is to integrate multiple different devices like PMU, metering devices and power quality analysers, with the same edge cloud software infrastructure.
Scope	Within the energy transition, more and more small sources and loads take part in local grid services and help with the energy awareness of individuals. The understanding of the energy demand of a specific process is key in increasing that awareness for future innovative approaches in manufacturing and production. To achieve that the integration of different types of monitoring devices with a common data platform is needed.
Objectives	The objective is the deployment and integration of third-party monitoring devices within the TARGET-X solutions.
Description of the ideal candidate	The ideal partner has infrastructure to monitor as well as special metering hardware for integration with 5G technologies.

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Title: 15_Power supply for mobile 5G sensors

Summary	The use of wireless technologies may be in doubt if a wired connection is required for its power supply. Since 5G sensors have a significant energy consumption when used for permanent data transmission, the question arises how a practicable use of 5G can be achieved in the industrial environment.
Scope	Determine what is the best solution for 5G usage in industrial environment, e.g: • increase of battery size which effects sensor size; • switch to low-band frequencies which lowers bandwidth; • use of energy harvesting technologies; • use of inductive power transfer; • use of photovoltaics.
Objectives	The goal is to find a viable solution for a 5G sensor that can survive an entire shift.

Title: 16_Energy aware industrial solutions

Summary	The knowledge about the consumption of industrial devices like machines, robots or other industrial systems is a key indicator for reduction of energy consumption in industrial applications. This task will deploy and integrate these measurements and will provide the resulting data sets as far as possible as open datasets for third parties to pick up on, for development of new optimization algorithms.
Scope	The industrial sector is a key contributor to the global CO2 emissions. Thus, reducing the consumption in this sector will contribute to a future CO2 neutral economy. The first step is to identify potential for reduction of energy consumption by deploying measurements devices and understanding the relationship of production and energy consumption.
Objectives	The objective is to deploy and or integrate energy measurements in industrial applications.
Description of the ideal candidate	The ideal partner is working in the production sector and already running small to medium-sized machinery.

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Title: 17_Multi level visualization

Summary	Intuitive user interface design and a broad integration of different use cases can be challenging. Providing an interactive and real world annotated visualization will enable the prosumer to better understand the impact of the different components of the system and their impact on the energy consumption. This virtualization will include a variety of different data sources and combine the information in a grand schema.
Scope	To achieve the goals in European green deal until 2030 for the reduction of CO2 emissions in all sectors, the first step is to identify the areas of maximum potential for CO2 reduction. This can be supported by visualizing the energy consumption and other metrics of the different components in, for example, manufacturing or construction process.
Objectives	The objective is to develop a visualization that provides an easy to use interface for large scale industrial consumers.
Description of the ideal candidate	The ideal candidate is specialized in modern UI development, as well as the key indices used to visualise the consumption and production of energy.

Title: 18_Deployment and data gathering in distribution grids

Summary	To allow for future big data analytics applications based on historical data, real-world data of the distribution grid will be acquired and sent to a central database. The goal is to provide the anonymized data to third parties by putting the data under a open-source licence as far as possible. The data will also be used to raise energy awareness for the data provider. The acquisition will utilize the edgePMU technology.
Scope	Increasing the observability is important, especially for the distribution grid, which is currently undergoing substantial changes. Placing additional monitoring devices will help that. As a side effect, the data can be stored and made available for scientific use to develop new algorithms and validate them based on real-world data.
Objectives	The objective is to deploy edgePMU measurement devices within a distribution grid and gather the data for increased grid and energy awareness as well as for central storage to foster future big data analytics use cases.
Description of the ideal candidate	The ideal partner is a distribution system operator.

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AUTOMOTIVE

Title: 19_Performance comparison between Edge- and public-Internet-deployed services

Summary	Besides deploying backend application servers to host on the public Internet, they can also be deployed on Edge hosts located close to peering points of Mobile Network Operators. This challenge aims at comparing those two deployment options from a performance, organizational and business relation perspective. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	A qualitative evaluation should be conducted based on criteria to be defined. This could, for example, be "business relations among involved actors." • The quantitative analysis should aim at one-way- and round-trip-latencies. For use cases including transmission (down- or upload) of objects (files) consisting of many IP packets, also the influence on TCP performance should be evaluated in terms of object transmission times. Those are known to also depend on the round trip times. It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	1. Running a real V2X application/service in both edge and public Internet and compare their performances. In this case, some steps are expected: • Development of service in both edge and cloud; • collecting performance from both edge and cloud communication and measuring KPIs (at least throughput, round trip latency, reliability, and interruption time due to handover or changing technology); • Creating comparison report. 2. Collecting and rating further differences between the two hosting options, e.g. implications on operations and contractual business relations depending on the ecosystem involved in one or more selected use cases in a real-world deployment.
Description of the ideal candidate	It should be a system analyzer or one of the candidates that provide an application and the testing equipment.

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Title: 20_Environment-aware teleoperated driving

Summary	A remote transportation controller is considered to control vehicles in the case of any environmental or technical problems. In order to increase safety in teleoperated driven vehicles, connectivity quality and/or environment characteristics can be inferred through sensors. This will allow the remote station to decide about car speed, stopping or driving the vehicle, etc. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	A teleoperated vehicle equipped with environmental/radio sensors should be provided together with a decision-making algorithm in the remote station. It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	Develop: • A system of sensors to collect environmental (cameras, LIDAR, sensors) or network resource (signal level, network congestion level) information; • Develop an algorithm that can find the best vehicle driving parameters (speed, trajectory, stopping/driving); • KPIs that can ensure the safety of the vehicle.
Description of the ideal candidate	The candidate should be either a SW company which works on system analyzing area, or a research organization. It should provide the whole teleoperation system with the car and developed tools.

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Title: 21_Automated Valet Parking (Type 2)

Summary	Automated Valet Parking (AVP) is a solution that allows a vehicle to be left at the drop-off area of the parking garage to be automatically parked based on available spots. The collection of the car follows a similar process. AVP type 2 uses infrastructure mounted sensors, e.g., parking facility, to guide the vehicle by the infrastructure. The sensors are mounted in the environment and used to evaluate the scene and vehicle position and transmit driving commands to the vehicle. This also includes detecting Vulnerable Road Users (VRUs) and assuring they are never endangered. https://youtu.be/Y1Y1ChYabWw. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	Although IDIADA cannot replicate a multi-story garage, but findings should be equally relevant for a single-story garage that can be replicated in IDIADA. Different scenarios, including ones with suddenly appearing VRUs, can be executed and evaluated in IDIADA. It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	The objective of this challenge as mentioned in the scope is to realize the AVP type 2 solution in IDIADA. This can be divided in phases: • Installation and basic testing of the infrastructure mounted sensors in IDIADA; • Experimental testing and performance evaluation of the use case; • Gap analysis, findings and key takeaways based on the experiments.
Description of the ideal candidate	A third-party entity bringing the infrastructure-mounted sensors and testing car to test the solution over the 5G network in IDIADA's testbed based on the objectives. Furthermore, comparative analysis between different QoS, cloud vs edge performance or others proposal could be included in the open call proposal by the third party. Dissemination of results in peer-reviewed publications is encouraged.

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Title: 22_Remote supervision for Autonomous Driving

Summary	Many autonomous driving services such as busses (People Movers) and taxis (Robo Taxis) only have a business case when there is no human driver on board. Still, for various reasons, interaction with a human must still be possible. The same principle is applied for every elevator, where passengers can always request contact to a human. Furthermore, automated driving algorithms might not be able to handle certain situations and/or authorities might demand that a human supervises or even remotely drives the vehicles in certain cases. Jurisdictions like Germany and California, US have put in place legal requirements for remote-supervision. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	Remote-supervision typically at least consists of telematics and a bi-directional voice channels, according to Californian regulations (as of April 2023). For Germany, the remote-supervisor must also be able to approve driving trajectories the vehicle is not able to autonomously decide and monitor the execution of these trajectories, always ready to press the emergency stop bottom. Monitoring is typically done through video streaming. • As those are legal obligations, certification authorities will typically demand a solution to monitor the network state, typically realized through a “watchdog”. The key challenge is therefore to guarantee network performance that prevents the watchdog from triggering an alarm, that would result in the vehicle having to stop. It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	Use-case realization by implementing a watchdog to monitor the network conditions. Carry out 5G performance measurements, different QoS, performance on cell edge, QoS prediction based on coverage.
Description of the ideal candidate	An autonomous bus or taxi company would be ideal, but only replicating the telematics and video-streaming service and especially watchdog would be sufficient. Entities with experience in watchdogs very welcome as well as certification bodies approving such solutions.

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Title: 23_Infrastructure-mounted sensors for automated buses

Summary	The maximum speed of an autonomous bus is nowadays typically limited to not more than 20 km/h. This is matching a worst-case approach allowing enough time to come to a stop if something suddenly happens, especially if a Vulnerable Road User (VRU) suddenly appears in the path. The reaction time depends directly on the sensing range of the sensors on the bus. Infrastructure-mounted sensors can overcome such limitations and be mounted in a way to allow more reaction time and therefore higher speeds. Entities operating the busses, e.g. the city, can also deploy and operate the infrastructure-mounted sensors. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	Processing of sensed data in for the sake of object detection should be done in the infrastructure, so raw sensor data sharing is not in the scope of this challenge. Information about processed objects must then be sent to the bus. Means to detect connection losses to the sensor must also be present and in this case the bus needs to slow down and only rely on its onboard sensors. • One-way-delay from sensor to bus should be evaluated. It should also be put in relation to the time required to process sensing and the update frequency of the sensor in order to determine an overall delay-budget for the service. It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	• Evaluate the overall delay from the moment something happens, e.g., a VRU crosses the path of the bus, until the information about the event is received and processed in the bus and translates to a reaction.; • With this, calculate how much faster the bus could drive compared to when it would only rely on its onboard sensors; • Consider multiple different scenarios and, if possible, rely on standardized scenarios of VRU-to-vehicle interaction, including worst-case ones.
Description of the ideal candidate	Ideally, an autonomous bus company with vehicles capable of receiving information from external sensors and considering it in their autonomous driving decisions, especially VRU detection. Sensor and bus company can be the same or different. In case no company can provide a bus. A sensor provider would be sufficient, and information would just be sent to a measurement PC connected over 5G. It should be a company manufacturing commercial-grade sensors to assure realistic object detection times.

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Title: 24_API deployment to abstract connectivity and data collection process for automotive applications

Summary	Development of a set of APIs aiming to simplify the work of application developers by hiding the complexity and technical details of underlying connectivity technologies. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	The scope of this challenge will be limited by the communication technologies offered by the infrastructure, such as c-v2x, v2x, 5G, 4G, and wifi. It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	The goal is to create a comprehensive and user-friendly API that simplifies the work for application developers. It should expose all the communication technologies that the infrastructure provides, including c-v2x, v2x, 5G, 4G, and wifi. The APIs may cover one or some of these features: 1. Sensor's data expositor; 2. Network infrastructure status expositor; 3. Data analysis system expositor; 4. Network infrastructure configuration.
Description of the ideal candidate	A SW development company providing APIs for V2X applications.

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Title: 25_Car, road, and edge processing time synchronization for V2X digital twins

Summary	The idea is adding car safety metrics into road digital twin. Hence having complete insight about perception of safety in each individual point of the road. This is mandatory to be able to map the relevant event which is happening in the car into the event in the road and have the correct process on that specific time. Hence, the reaction of the car in terms of safety KPI can be studied in different road situations. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	The proposed solutions should have the sensors measuring the car safety (e.g. the fuel pressure, pressure on shock absorber and springs, tire status, the status of airbag, to mention as a few) being synchronized with road sensors as well as the edge processing system. It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	The output to cope this challenge might be: 1. An algorithm which can truly identify the time shift between Car/road sensors and edge server; 2. A method of synchronization which can run on car/road sensors to report the collected data by adding a time stamp which is recognizable with edge server.
Description of the ideal candidate	The process includes roughly 70% investigation about the possible ways and generating the algorithm and 30% for generating the code. If codes are going to run in sensor sides, there would be extra effort for integrating the codes into sensors. So, I would suggest an app generator candidate having the background of providing machine level codes.

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Title: 26_Methods of satisfying UL/DL tend use-cases with a fixed TDD configuration

Summary	There are different types of use-cases. Some of them are UL tend which demands more uplink traffic while others are DL tend and demands more downlink traffic. The ambitious situation is that changing the TDD configuration to satisfy this need. But in the real/public world, changing the TDD configuration is either difficult or impossible. The idea is imposing some mechanism in Network/Transport/Application layers to provide some kind of concurrency between UL/DL tend traffics to satisfy both of the wile keeping the TDD configuration unchanged. The idea is adding car safety metrics into road digital twin. Hence having complete insight about perception of safety in each individual point of the road. This is mandatory to be able to map the relevant event which is happening in the car into the event in the road and have the correct process on that specific time. Hence, the reaction of the car in terms of safety KPI can be studied in different road situations. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	The scope of this challenge is to develop an optimization mechanism to TCP/IP protocol for V2X application and tested with a moving vehicle. It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	The objective is to provide improvement in TCP/IP protocol to add the functionality of interleaving massive upload and download while keeping the QoS.
Description of the ideal candidate	The candidate should be an R&D based organization which has experiences on TCP/IP improvement.

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Title: 27_Connected Ambulance

Summary	This use case allows medical doctors to connect to ambulance and provide real time help to medical staff in the ambulance that is carrying a patient in critical case. The help could be either a videoconference, haptic signals, or having remote access to a dashboard of reporting all health status of the patient. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	Focus should be on real time reliable communication between the ambulance and the hospital. The provided application should also include the necessary equipment. The idea is adding car safety metrics into the road digital twin. Hence having complete insight about the perception of safety in each individual point of the road. This is mandatory to be able to map the relevant event which is happening in the car into the event in the road and have the correct process on that specific time. Hence, the reaction of the car in terms of safety KPI can be studied in different road situations. It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	The objective is to develop a real time reliable application and equipment that provide access to medical doctors to moving ambulance at high speed. The features could be: 1. Videoconference with the nurse in the ambulance; 2. Providing haptic signal to supervisor in the hospital; 3. Exposing health data status from health machines on board and make them visible for the remote supervisor/doctor in the hospital.
Description of the ideal candidate	A software development company.

Title: 28_Vehicle platooning

Summary	The idea is two have 2 or more CAVs in convoy. The CAVs should autonomously go through the same path and maintain close distance between each other using a connection to mobile network.
Scope	The challenge will be applied to CAVs that deploys a control algorithm and reliable positioning and synchronization tools for platooning.
Objectives	This is a V2V use-case which aims to keep the same status (i.e., speed, relative distance, same route selection, to name as a few) in all vehicles in a convoy. The objective is to develop a control algorithm and tools for safe platooning service at different speed.

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Title: 29_Digital twins' generation methodology for road safety

Summary	It aims to define and implement a new methodology to create digital twins by using real data. The idea is adding car safety metrics into road digital twin. Hence having complete insight about perception of safety in each individual point of the road. This is mandatory to be able to map the relevant event which is happening in the car into the event in the road and have the correct process on that specific time. Hence, the reaction of the car in terms of safety KPI can be studied in different road situations. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	Using the different sensors available in the vehicles (such as radars, cameras, LiDARS, position sensors, accelerometers, etc.) it is intended to collect and send all the possible real information to an Edge node and the Cloud to be processed. The means used to transmit vehicle information to processing will be via the IDIADA cellular network (using 4G/5G). It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	It is intended to send real information of the vehicle to the Cloud (e.g., AWS) or an Edge node to process data and thus create a traffic simulation model based on digital twins' generation, able to adapt and integrate in one or more virtual environments (ViL, SiL, MiL, HiL, driving simulator, etc.).
Description of the ideal candidate	• Suppliers of V2X equipment to provide material to the vehicle (cameras, LiDARS, position sensors, accelerometers, outdoor cellular antennas, cellular 4G/5G modems, and OBUs); • OEMs who wish to virtualize their data to be used later in any use case required in EURO NCAP; • Any company which aims to create EURO NCAP CAV use cases; • Any SW company wishing to design and integrate a complex data system in order to simulate digital twins in a virtualized environment; • Any company which can provide SW development to create traffic simulation models (ViL, SiL, MiL, HiL, driving simulator).

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Title: 30_Cooperative perception for Connected and Automated Vehicles (CAVs): Preventive Collision Warning

Summary	This challenge is intended to design a C-ITS service capable of providing collision warnings to users in the environment. The idea is adding car safety metrics into road digital twin. Hence having complete insight about perception of safety in each individual point of the road. This is mandatory to be able to map the relevant event which is happening in the car into the event in the road and have the correct process on that specific time. Hence, the reaction of the car in terms of safety KPI can be studied in different road situations. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	This challenge is intended to give an opportunity to any third party which wants to develop and test a new collision warning service by using cellular network (4G and 5G) technologies. It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	By using two vehicles (host and target), two servers (Edge and Cloud) and two technologies (4G and 5G), it is intended to design and to evaluate the behavior and performance of a new collision alert service (C-ITS).
Description of the ideal candidate	Companies which can provide connected testing vehicles. Any company which aims to develop a preventive collision warning platform/service by using C-ITS technologies considering they will need a minimum of 2 vehicles to test their service.

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Title: 31_Cooperative perception for Connected and Automated Vehicles (CAVs): Cooperative Sensing (I)

Summary	Through this challenge it is intended to design a system to send HD maps in real time to specific vehicles in an environment. The idea is adding car safety metrics into road digital twin. Hence having complete insight about perception of safety in each individual point of the road. This is mandatory to be able to map the relevant event which is happening in the car into the event in the road and have the correct process on that specific time. Hence, the reaction of the car in terms of safety KPI can be studied in different road situations. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	To design a system capable of sharing HD maps between infrastructure and specific vehicles to an environment, either because the vehicle enters a totally unknown area or because the information the vehicle has regarding the environment must be updated. It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	Using the HD maps of an environment, this challenge aims to design and evaluate, through an Edge node and a server in the Cloud, the cooperation between infrastructure and vehicles to update maps under different network conditions (4G vs 5G).
Description of the ideal candidate	• Companies which can provide connected testing vehicles; • Any company which aims to develop a system capable of sending HD maps through the network (4G and 5G) by using C-ITS technologies considering they will need a minimum of 2 vehicles to test their service. Any company which is capable of processing HD maps information to integrate into the infrastructure thus sending this data to a specific target vehicle.

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Title: 32_Dynamic Operational Design Domain (ODD) according to network conditions

Summary	As the required QoS may not be always guaranteed to autonomous cars due to network conditions (propagation loss, vehicle speed, network congestion), safe driving may imply to adapt connected autonomous vehicle (CAV) functions (e.g., activation, deactivation) to QoS change. In addition, knowing these conditions in advance will allow proactive adjustment of CAV function in order to avoid any malfunction. The idea is adding car safety metrics into road digital twin. Hence having complete insight about perception of safety in each individual point of the road. This is mandatory to be able to map the relevant event which is happening in the car into the event in the road and have the correct process on that specific time. Hence, the reaction of the car in terms of safety KPI can be studied in different road situations. Within TARGET-X, a methodological assessment framework is built enabling an evaluation of the implemented 5G use cases and assessing their technical, economic, and societal impact. To ensure a holistic assessment of as many 5G use cases as possible, a project funded by the TARGET-X cascaded funding initiative should also be able to be assessed using the developed methodological assessment framework.
Scope	Focus should be on developing QoS prediction algorithm together with the required sensors and tools. It should be noted that IDIADA will provide only the communication infrastructure.
Objectives	The objectives of this challenge are: • Collection of data related to network condition; • QoS prediction algorithm; • Notification of the CAV and application of the adjustment.
Description of the ideal candidate	The ideal candidate might be an individual researcher or a research organization which works on optimization algorithms.

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CONSTRUCTION

Title: 33_ BIM-based design of a demonstrator structure according to cradle-to-cradle principles including site supervision during construction

Summary	As part of the TARGET-X project, a multi-material demonstrator structure (approx. 9mx15mx12m) is to be created on the Reference Construction Site of the Center Construction Robotics. The demonstrator will provide the basis to investigate the real and technical feasibility of the cradle-to-cradle principle (C2C), including construction and deconstruction of a built structure. In order to meet not only the challenge of material scarcity, but also other current challenges of the construction industry, such as the shortage of skilled workers and lack of digitalization, as many process steps as possible in the construction and deconstruction of the reference structure should be automated and/or performed by robots within the infrastructure and applying the technologies of an existing 5G-network. The TARGET-X project includes a methodological assessment framework that evaluates the technical, economic, and social impact of 5G use cases. To ensure a comprehensive assessment of as many 5G use cases as possible, the framework can also be applied to projects funded by the TARGET-X cascaded funding initiative.
Scope	Firstly, the design and the planning of the demonstrator need to guarantee access for humans and machines. Therefore, a complete structural analysis is inevitable. Apart from safety reasons, the design, planning and building phase have to take into account how the deconstruction at the end of the building's life cycle can be realized as minimally invasive as possible. In the end, undamaged building components shall be preserved for reuse respectively a secondary rebuilt. The design result should resemble a living construction kit. The goal is to deconstruct the demonstrator and rebuild it at fairs (such as BAUMA 2025) for the demonstration of TARGET-X project. Furthermore, the design and selected construction materials and their associated joining methods have to allow the (semi-)automated use of machinic assistants e.g., lifts, cranes, excavators, forklifts, mobile platforms or robots. Likewise, not only the building methods can be studied but also the influence of different building materials on wireless networks like the 5G-network. The partially automated construction processes are to be coordinated centrally with the help of a process ontology on top of BIM provided by TARGET-X researchers. This recorded process data is to be fed back to the central planning data in BIM for construction supervision and as “as-Built” documentation. There, the data will be processed and stored for deconstruction.
Objectives	Design of a temporal, deconstructable demonstrator structure (approx. 9mx15mx12m) according to C2C principles including different building techniques and building components such as prefabricated timber, steel and concrete modules. Creation of a 3D BIM model for construction and deconstruction. Providing all necessary documents and approvals for a “flying structure” such as a temporal indoor and outdoor fair stand on the Reference Construction Site in Aachen and at BAUMA 2025 in Munich, including structural analysis and assembly and disassembly planning of the demonstrator. Detailing for semi-automated construction and deconstruction incorporating all

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	necessary information in close collaboration with modular construction companies. Application of the linked data driven approach delivered by the TARGET-X Consortium and technical challenges as a basis for site supervision and BIM-based project documentation.
Description of the ideal candidate	An ideal candidate is a team of architect and structural engineer who has proven experience with cradle-to-cradle designs and the certification of such. Furthermore, he/she/they can prove expertise with temporal, deconstructable and/or flying structures such as exhibition stands or booths. Additionally, he/she/they are based in the Aachen region in order to be able to visit the construction site on a regular basis and perform site supervision together with technology partners. Another key feature is the proven expertise as BIM coordinator. Lastly, the ideal candidate can provide a complete 3D BIM model with a detailed process design for construction and deconstruction of the building parts.

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Title: 34_ Automation or semi-automation of timber construction processes

Summary	As part of the TARGET-X project, a multi-material demonstrator structure (approx. 9mx15mx12m) is to be created on the Reference Construction Site of the Center Construction Robotics. The demonstrator will provide the basis to investigate the real and technical feasibility of the cradle-to-cradle principle (C2C), including construction and deconstruction of a built structure. In order to meet not only the challenge of material scarcity, but also other current challenges of the construction industry, such as the shortage of skilled workers and lack of digitalization, as many process steps as possible in the construction and deconstruction of the reference structure should be automated and/or performed by robots within the infrastructure and applying the technologies of an existing 5G-network. The TARGET-X project includes a methodological assessment framework that evaluates the technical, economic, and social impact of 5G use cases. To ensure a comprehensive assessment of as many 5G use cases as possible, the framework can also be applied to projects funded by the TARGET-X cascaded funding initiative.
Scope	In order to investigate the applicability for as many materials and construction methods as possible, characteristic processes in the field of modular timber construction shall be digitalized, partially automated and/or robotically assisted. This includes prefabrication as well as the assembly on the construction site. During execution, process data is collected with a variety of sensors and fed back to the central data management based on BIM by utilizing an existing 5G infrastructure. Based on the concepts of building information modeling and digital twins, this data can provide valuable information about the process status itself. Furthermore, it can highlight the benefits of information and data exchange, automation opportunities and/or robotic assistance but also its shortcomings. The goal is to deconstruct the demonstrator at the Reference Site and rebuild it at fairs (such as BAUMA 2025) for the demonstration of the TARGET-X project.
Objectives	• Prefabrication and onsite assembly of the timber modules (wall, slab, façade, roof modules) as part of a multi-material demonstrator structure (approx. 9mx15mx12m) designed by a team of architects and structural engineers; • Adaption of characteristic construction processes and/or materials to fulfil C2C requirements and semi-/automated assembly and disassembly; • The use of digital information exchange is mandatory. Additionally, it is important to ensure access to the data from preproduction processes and onsite assembly; • Incorporation of robotic assistant systems for modular timber construction; • Recording of process data, feedback and data exchange into the underlying BIM-model for C2C project assembly/ disassembly and documentation.
Description of the ideal candidate	The ideal applicant is a team of a prefabricator for timber modules (wall, slab, façade, roof) and an expert for on-site assembly. The prefabricator can ideally provide a fully digitalized and (semi-) automated production facility using e.g., CNC milling, joining systems and/or robotics for timber wall, slab, roof and façade modules. Furthermore, the in-house factory should provide commonly used timber design software e.g., CADWorks, BTL and/or ERP systems and/or KUKA Robot Language, or similar. Proven expertise in

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	implementing and using IFC models and digital plans in the manufacturing process are of advantage. The assembler should be based in reachable distance to be able to visit the Reference Construction Site in Aachen for construction during the funding phase and assembly and disassembly at BAUMA 2025 in Munich. Finally, the ideal applicant should have an interest in implementing design changes according to the requirements of C2C-principles, automation and/or robotics.

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Title: 35_ Automation or semi-automation of steel and concrete construction processes

Summary	As part of the TARGET-X project, a multi-material demonstrator structure (approx. 9mx15mx12m) is to be created on the Reference Construction Site of the Center Construction Robotics. The demonstrator will provide the basis to investigate the real and technical feasibility of the cradle-to-cradle principle (C2C), including construction and deconstruction of a built structure. In order to meet not only the challenge of material scarcity, but also other current challenges of the construction industry, such as the shortage of skilled workers and lack of digitalization, as many process steps as possible in the construction and deconstruction of the reference structure should be automated and/or performed by robots within the infrastructure and applying the technologies of an existing 5G-network. The TARGET-X project includes a methodological assessment framework that evaluates the technical, economic, and social impact of 5G use cases. To ensure a comprehensive assessment of as many 5G use cases as possible, the framework can also be applied to projects funded by the TARGET-X cascaded funding initiative.
Scope	In order to investigate the applicability for as many materials and construction methods as possible, processes in the field steel and modular concrete construction will be digitalized, partially automated and/or robotically assisted. This includes prefabrication as well as the assembly on the construction site. During execution, process data is collected with a variety of sensors and fed back to the central data management based on BIM by utilizing an existing 5G infrastructure. Based on the concepts of building information modeling and digital twins, this data can provide valuable information about the process status itself. Furthermore, it can highlight the benefits of information and data exchange, automation opportunities and/or robotic assistance but also its shortcomings. The goal is to deconstruct the demonstrator at the Reference Site and rebuild it at fairs (such as BAUMA 2025) for the demonstration of TARGET-X project.
Objectives	• Prefabrication and onsite assembly of steel and concrete modules (wall, slab, façade, modular stairs, roof) as part of a multi-material demonstrator structure (approx. 9mx15mx12m) designed by a team of architects and structural engineers; • Adaption of characteristic construction processes and/or materials to fulfill C2C requirements and semi-/automated assembly and disassembly; • The use of digital information exchange is mandatory. Additionally, it is important to ensure access to the data from preproduction processes and onsite assembly; • Incorporation of robotic assistant systems for modular steel and/or concrete construction; • Experience with visualization and communication technologies like XR (e.g., Holo Lense or Lynx-R1), point cloud scans are of advantage.
Description of the ideal candidate	The ideal candidate would be an interdisciplinary consortium of a steel construction company for pre-fabrication and construction company for modular concrete. Both need to have an on-site assembly team who is able to visit the Reference Construction Site in Aachen for construction tasks during the funding phase and assembly and disassembly

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	at BAUMA 2025 in Munich. Also, both companies should have several years of proven expertise in digital manufacturing, transport and installation of prefabricated modules. Ideal candidates have an in-house plant for prefabricated elements to implement design changes according to the requirements of construction robots, process automation and C2C-principles. Proven expertise in implementing and using IFC models and digital plans in the manufacturing process are of advantage. Utilizing NC machines is mandatory as well as programming skills for using robots for manufacturing processes are of advantage.

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Title: 36_ Transferrable control unit for the automation of construction machines

Summary	As part of the TARGET-X project, a multi-material demonstrator structure (approx. 9mx15mx12m) is to be created on the Reference Construction Site of the Center Construction Robotics. The demonstrator will provide the basis to investigate the real and technical feasibility of the cradle-to-cradle principle (C2C), including construction and deconstruction of a built structure. In order to meet not only the challenge of material scarcity, but also other current challenges of the construction industry, such as the shortage of skilled workers and lack of digitalization, as many process steps as possible in the construction and deconstruction of the reference structure should be automated and/or performed by robots within the infrastructure and applying the technologies of an existing 5G-network. The TARGET-X project includes a methodological assessment framework that evaluates the technical, economic, and social impact of 5G use cases. To ensure a comprehensive assessment of as many 5G use cases as possible, the framework can also be applied to projects funded by the TARGET-X cascaded funding initiative.
Scope	Trained specialists are becoming less and less available. In particular in the construction industry, there is an increasing shortage of specialized skilled workers who can operate machines. Machine-specific training is often lengthy and costly. Simplified, possibly modular, control devices that can be transferred to a variety of machines may provide a solution. This means that only one control system needs to be learned to enable skilled workers to operate different construction machines. Additionally, this could drastically expand the group of people who are capable of performing these tasks. For example, female workers or people with handicaps could be enabled to operate heavy construction machinery.
Objectives	• Development of a transferable, teleoperated control unit/remote control for construction machines (e.g., mobile cranes, excavators or other mobile robotic platforms); • The design of the control unit should support an intuitive operation ideally with ergonomically designed haptic controls; • Proof of concept for portability between different machines; • Software for controlling manipulated variables on the machines, e.g., by using actuators; • Implementation of an emergency stop function; • Inclusion of a 5G-capable interface to test the performance of the 5G-network for remote control purposes; • Possibility of extension with additional displays for more challenging teleoperation tasks.
Description of the ideal candidate	An ideal candidate can provide a combined hardware and software solution for a transferrable, teleoperated control unit for construction machines. This could also be a proofed implementation from another domain like agriculture or logistics which is adaptable for construction machines from various brands. The company must be able to integrate its solution into the existing 5G network at least for the purpose of data transfer.

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Title: 37_BIM-based, automated component marking

Summary	As part of the TARGET-X project, a multi-material demonstrator structure (approx. 9mx15mx12m) is to be created on the Reference Construction Site of the Center Construction Robotics. The demonstrator will provide the basis to investigate the real and technical feasibility of the cradle-to-cradle principle (C2C), including the construction and deconstruction of a built structure. In order to meet not only the challenge of material scarcity, but also other current challenges of the construction industry, such as the shortage of skilled workers and lack of digitalization, as many process steps as possible in the construction and deconstruction of the reference structure should be automated and/or performed by robots within the infrastructure and applying the technologies of an existing 5G-network. The TARGET-X project includes a methodological assessment framework that evaluates the technical, economic, and social impact of 5G use cases. To ensure a comprehensive assessment of as many 5G use cases as possible, the framework can also be applied to projects funded by the TARGET-X cascaded funding initiative.
Scope	The application of markings to construction objects serves to transfer information from the plan to the real construction site. The exact measurement of distances and the drawing of wall courses, for example, are highly important but time-consuming and thus cost-intensive tasks. At the same time, they are easily prone to errors. One way to meet this challenge is automation. This would connect the digital twin in the BIM model directly to the built structure on site. In addition, the markings could be optimized so that they not only carry information of the building element but also that they can be recognized again by robots or other machines in subsequent (automated) work steps.
Objectives	Development of a robotic device for automated high definition marking of building elements in scalable formats. The marking tool/device is required to communicate to BIM in order to connect the digital twin to the real world and transfer the information from the digital model accurately. This communication is supposed to take place via the 5G infrastructure at hand. Furthermore, the device needs to be able to draw or print geometric shapes like points, curves and texts with high accuracy on various materials such as concrete, wood or aluminum. The type of information can vary from complete construction layouts to be drawn on foundation plates to material specifications provided as e.g., QR-code.
Description of the ideal candidate	The ideal candidate can provide an already automated robotic printing device that can be integrated into an existing 5G network. Another option could be a printing device whose basic design allows for automation. In both cases, the applicant should be able to integrate the device into the existing 5G network, at least for communication purposes. Another key feature of an ideal candidate is proven BIM expertise since all the information to be transmitted is stored in a BIM model, retrieved from it.

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Title: 38_ Effects of 5G networks on established solutions for asset tracking and remote monitoring at construction sites

Summary	As part of the TARGET-X project, a multi-material demonstrator structure (approx. 9mx15mx12m) is to be created on the Reference Construction Site of the Center Construction Robotics. The demonstrator will provide the basis to investigate the real and technical feasibility of the cradle-to-cradle principle (C2C), including construction and deconstruction of a built structure. In order to meet not only the challenge of material scarcity, but also other current challenges of the construction industry, such as the shortage of skilled workers and lack of digitalization, as many process steps as possible in the construction and deconstruction of the reference structure should be automated and/or performed by robots within the infrastructure and applying the technologies of an existing 5G-network. To streamline processes for automation, precise and timely accurate knowledge of workflows and material flows is mandatory. The concept of internet of things (IoT) provides solutions for the collection and integration of sensor data for tracking and process monitoring. The combination of this information with digital twins can provide the database for improved process planning. The TARGET-X project includes a methodological assessment framework that evaluates the technical, economic, and social impact of 5G use cases. To ensure a comprehensive assessment of as many 5G use cases as possible, the framework can also be applied to projects funded by the TARGET-X cascaded funding initiative.
Scope	Established tracking and monitoring software uses a wide range of sensor data, usually in combination with one type of network technology, for example Low Power Wide Area Networks (LPWAN). Yet, different sensors and their respective data streams have distinct optimal network characteristics. To this point the behavior of different coexisting network types and their effect on each other shall be studied under the variable conditions at a construction site.
Objectives	Setup of a stable and reliable low power network e.g., LoRaWAN on the Reference Construction Site for highly precise indoors and outdoors tracking of machines and building elements. The low power network has to guarantee secure end-to-end communication across the value chain for the monitoring of current operation status but also complete process sequences. Furthermore, data from 5G IoT devices is to be made available through standard interfaces. While the integration of a BIM interface shall enable communication with the central management unit. Provide data for a study of the behavior of low power and 5G technologies when existing parallel. How do the networks influence each other? Can negative interferences arise? Is the data transfer accurate and robust enough to ensure stable communication? If not, what adaptations to the networks are possible for a positive coexistence?
Description of the ideal candidate	An ideal candidate can provide a low power solution (hardware and software) for the tracking of objects. To ensure a robust bi-directional data transfer, the company has to prove several years of experience in the planning and setup of LPWAN. Apart from this, the company is required to have proven expertise in working with BIM models as well

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	as the concepts of IoT and digital twins related to tracked assets and IoT remote monitoring on construction sites and buildings.

Title: 39_ Potentials of renewable energies for self-sufficient construction sites

Summary	Increasing resource bottlenecks are having a particularly severe impact on the construction industry. This is because the resulting cost increases affect not only building materials but also the energy sources needed to operate construction sites. Supplying construction sites with renewable energies could be one approach to a solution. Moreover, construction sites are often set up in places without existing infrastructure. In this case, too, self-sufficient energy supply could hold a lot of potential. The TARGET-X project includes a methodological assessment framework that evaluates the technical, economic, and social impact of 5G use cases. To ensure a comprehensive assessment of as many 5G use cases as possible, the framework can also be applied to projects funded by the TARGET-X cascaded funding initiative
Scope	For the operation of critical infrastructure, machines, containers, etc. on construction sites, a supply of electricity is necessary. Up to now, electricity has usually been produced by generators. Their operation generates noise, causes emissions and consumes fuel. An alternative for ecological, sustainable and reliable electricity production could be mobile wind turbines or solar panels with dedicated storage solutions. They could be installed on unused areas such as the roofs or construction containers. By analyzing production and consumption data in real-time, 5G technologies can support the evaluation of the balance between energy production and consumption, making it easier to determine the feasibility of the energy generation strategies. From the time accurate recording of individual energy consumptions and loads the total energy consumption of the site can be determined. Also, it enables energy-optimized process coordination and the detection of anomalies.
Objectives	Development of a concept for the use of renewable energies on construction sites. Installation of renewable energy sources (e.g., mobile wind turbines, PV panels etc.) and a storage solution on the Reference Construction Site of the Center Construction Robotics in Aachen. Analysis of which fraction of the total energy demand can be covered by the on-site installed sources. Utilize 5G edge cloud technology for the balancing algorithm of production and consumption. Identification of characteristic on site consumers and creation of consumption profiles of typical machines and their tasks. Automated forwarding of recorded data to a central process control unit using the existing 5G-network infrastructure. Provide the results in a human-comprehensive format respectively monitoring software.
Description of the ideal candidate	A suitable applicant will have several years of experience in designing and implementing sustainable energy and storage solutions. This could be for example photovoltaic systems or wind turbines or a mix of both. The applicant must be able to visit the Reference Construction Site in order to carry out measurements for the analysis of requirements independently. Apart from that, the applicant must be able to organize the logistics for all required modules himself. Furthermore, the company must be able to assemble and commission the planned energy storage itself. Finally, the ideal candidate can provide

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	existing software which can present a breakdown by individual consumers and producers in the grid and allows connection to an existing 5G network for data exchange.

TECHNOLOGY EVOLUTION BEYOND 5G

Title: 40_Auto-device onboarding

Summary	The onboarding of devices consists of the connectivity but also of the actual user plane function control. This includes the secure deployment of configurations, e.g. VPN as well as the control of local services.
Scope	Implement methods to ease the onboarding of devices into private 5G networks. Typically, many manual steps need to be executed before a device is online and ready to use in the network. This challenge looks for methods to optimize the onboarding of new devices to a NW and demonstrates the methods in 1 of the available testbeds.
Objectives	The objective is to provide an easy-to-use framework for the device provisioning and service control going beyond the connectivity management.
Description of the ideal candidate	A company specialized in cloud infrastructure and software development.

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Title: 41_Multiple device, automated and systematic network performance measurements tool

Summary	New and extended applications are leveraging of the benefits, new features and technologies from 5G NR. Those applications often have different traffic network requirements compared to the classical mobile broadband (MBB) approach in cellular communications. For instance, industrial applications usually have higher UL requirements compared to the DL oriented traffic in MBB. Other verticals also have applications with different network requirements coexisting under the same coverage area. As the variety of applications coexisting may scale up it is highly important to systematically study the performance of each coexisting application at the same time. Generally, the different coexisting traffic profiles may have different packet sizes, transmission bitrates, quality of service and time critical requirements, such as bounded latency or non-jitter applications. Therefore, there is a need for understanding and systematically study the network performance specially for those environments with mixed traffic profiles.
Scope	The intention is to onboard a third party capable of conducting sys-tematic measurements with different traffic profiles, collecting the necessary data and extract relevant key performance indicators (KPIs) to analyze the network behavior for mixed traffic scenarios. Furthermore, during mentoring a study could be discussed in order to find a suitable study candidate to analyze different traffic profiles.
Objectives	A tool to systematically carry out 5G measurements in one of the TARGET-X testbeds with multiple devices and traffic profiles.
Description of the ideal candidate	A third party bringing their own hardware and software capable of carrying out measurements in a 5G network with the following requirements: • Tests with different traffic profiles and multiple devices at the same time; • Collecting data of the experiments; • Extraction of relevant key performance indicators (KPIs). For instance, one-way throughput, round trip time, one-way latency, packet loss, jitter, etc. Add-on would be a study proposal related to the technology or verticals in TARGET-X with the potential for a conference or journal publication.

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Title: 42_Monitoring convergence

Summary	In IT systems, monitoring of device entities is largely done with SNMP. 5G modules / chipset also offer statistics, but via various interfaces (AT, proprietary if's). The challenge aims at proposing more generic interfaces that expose relevant information elements of devices via a unified interface (e.g. SNMP) for easy integration into available monitoring solutions.
Scope	Supervision of devices in the field is of very high importance to ensure a high availability. This is especially the case for devices used in connection to critical infrastructure. The goal is to collect health data of a variety of devices that are mainly, but not exclusively, Linux based.
Objectives	The acquired data is used to send alerts based on thresholds and develop a UI that provides an overview of the available devices.
Description of the ideal candidate	A company specialized in cloud infrastructure and cross operating system software development as well as web services.

Title: 43_Remote wake-up of devices

Summary	Controlled power up and power down of 5G devices.
Scope	5G industrial devices are still consuming quite a lot of energy. RedCap / NR Light chipset are coming, but reduced power consumption brings also less available bandwidth. Many industrial scenarios require high bandwidth, but devices are not used all the time. Increase battery lifetime by optimizing the runtime of the devices.
Objectives	Increase time between charges for high bandwidth 5G devices.

Title: 44_Indoor heatmapping

Summary	Develop an Android application (iOS likely not possible in NPNs) that uses onboard sensor data, camera data, etc to correlate RSSI, RSRP values to a position within an indoor area. Output this data in a format for further online or offline use.
Scope	App development for indoor heatmapping of indoor 5G networks.
Objectives	Smartphone applications for heatmapping operations exist, but typically require the user to pre-define spots where measurements of RSSI, RSRP etc. are made. Develop a novel method to perform these actions in an easier/comfortable way by making smart use of the smartphone SDKs and onboard sensors.

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Title: 45_Applicability of mmWave for TARGET-X verticals

Summary	Showing is believing! Following this motto, the challenge is to come up with the implementation of a use case that uses the benefits of FR2 spectrum and that is not or not easy to realize with the sub6 GHZ spectrum.
Scope	Present use case proposal for mmWave application, preferably relevant to 1 of the 4 TARGET-X verticals.
Objectives	• Use case description and definition relevant to one of the four TARGET-X verticals: manufacturing, automotive, energy and construction.=; • Integration and development of the use case in a 5G mmWave network in one of the testbeds of TARGET-X; • Performance evaluation and KPI/KVI analysis of the use case; • Study report, analysis of benefits and learnings of the use case implementation in a 5G mmWave network.

Title: 46_Access control for inter-AAS communication

Summary	Thanks to standardized interface and language, AAS provides an interoperable communication at the factory floor. However, the access for certain data stored in the AAS should be restricted. For example, NW AAS stores relevant information about the 5G NPN (e.g., performance measurements), which should not be easily accessed by all device AAS instances. It is a challenging process to implement access control for devices, which is scalable. The requirements of security and other processes should be taken into consideration for controlling the device access in AAS layer.
Scope	AAS provides standardized interface and language for establishing communication among AAS instances. However, there should be an access control mechanism to address the security and privacy issues. For example, the device or 5G UE AAS instances should not be able to access the low-level information (e.g., performance measurements) available in 5G NW AAS. Therefore, authenticating the AAS instances and controlling their access to other AAS instances (e.g., submodels) plays an important role in the overall management system.
Objectives	The main objective in this topic is to design and develop access control solutions for communication among AAS instances. The developed solution should consider the requirements regarding management operations and confidentiality.

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Title: 47_Cyber-security leveraging AI/ML

Summary	Connected cars and systems increasingly rely on a variety of sensors to ensure safety. However, the increasing amount of connectivity also increases the attack surface of the system. These devices may need to be upgraded, and malicious agents can exploit vulnerabilities in unprotected modules to gain access and move horizontally within the system, accessing other modules. To prevent such attacks, we propose the creation of AI and ML based mechanisms that can detect and prevent possible attacks.
Scope	Depends on the sensors on the vehicle, this challenge focus on the onboarded devices and its software modules.
Objectives	The goal of this challenge is to develop mechanisms that utilize AI or ML to aid in detecting and preventing attacks that exploit potential vulnerabilities in the onboarded software. This approach will prevent horizontal attacks from within and protect more critical components of the system.

Title: 48_Golden Unit

Summary	In some occasions during network performance evaluation it has been observed that for similar environments the network performance observed by the testing units is different or unexpected results occur. Those differences can often be related to changes in radio conditions, network configuration, devices, implementation of applications, etc. Furthermore, definition of network performance KPIs are sometimes ambiguous. For instance, latency is often considered as round- trip time, one-way delay and end-to-end application delay at the same time. Generally, this leads to complains and finger-pointing among the network, devices, applications, etc. A golden unit could offer a real evaluation of the network performance as a benchmark. For instance, it could help identify whether delays may be coming from the network, device processing or application.
Scope	Network performance assessment for quickly benchmarking and evaluating network related KPIs. Useful for new users and to quickly troubleshoot a 5G network in order to understand its capabilities for a given network configuration.
Objective	A third party develops and implements a golden unit prototype solution for network benchmarking. The golden unit may include a PC with a 5G modem to quickly assess the network performance with capabilities for testing different traffic profiles, i.e., payloads, bitrates, L2/L3 traffic, etc. The unit should consist of hardware and software easily and openly accessible to anyone who would like to replicate.
Description of ideal candidate	The ideal candidate is able to develop a prototype with a solution out of the box capable of quickly assessing the network performance based on very simple network KPIs like Ping round-trip-time. The third party can alternatively provide a list of software and hardware capable for building the golden unit. Add-on to the prototype could be a proposal to publish the findings and proposed solution in a conference or journal paper.

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The project is supported by the SNS JU and its members.

Information clause for personal data processing in the 1st Open Call organized under TARGET-X Project

Grant Agreement No. 101096614

CONTROLLER`S IDENTITY AND CONTACT DETAILS

The data controllers are all entities in the FundingBox capital group as the Joint Controllers. All FundingBox entities have agreed on common data processing purposes. In all matters regarding personal data, you can contact us using the following email address: privacy@fundingbox.com.

The essence of the arrangement is available here.

PURPOSES, LEGAL BASIS AND PROCESSING PERIOD

The purpose and legitimate interest of processing	Legal basis for processing	Period
1) To run an Open Call and collect data necessary to evaluate applications submitted in the Open Call.	Legitimate interest of FundingBox (based on Art. 6.1.f) of GDPR) which is fulfilling the obligations and our other interests related to implementation of the Project.	6 years from the end of the year in which the Project ended.
2) To realize the Project goals described in the Grant Agreement (e.g. communication, reporting, collaborating with other project partners).		
3) To consider potential complaints.		
4) To gather feedback from applicants when the Open Call is over to improve processes.		
If an applicant has been selected to become the beneficiary of the project:		
5) To collect the applicant's details and documentation necessary to verify its legal status. Data will be collected in separate form via FundingBox platform.	Processing is necessary for the performance of a contract (based on Art. 6.1.b) of GDPR).	

DATA RECEIVERS

The Joint Controllers will transfer personal data only to trusted recipients such as IT service providers, accountants, law firms, postal and courier companies (who process personal data on the controllers' behalf).

Due to the fact that we use the services of Google LLC, your data may be transferred to the USA. We have concluded an agreement with those entities – the so-called Standard Contractual Clauses. This means that in accordance with the decision of the European Commission No.

2021/914 EU of June 4, 2021, your personal data may be processed by this company in the USA. More information about the decision at: https://fundingbox.com/trust/transfer-outside-eea/.

To realize the Project, data can be transferred also to Project Partners (complete list of the project partners is available at the email address: privacy@fundingbox.com) and European Commision.

RIGHTS OF DATA SUBJECT

Due to the fact that we process your personal data, you have the right to:

1) request access to your personal data,
2) demand the rectification of your personal data,
3) request to remove or limit the processing of your personal data,
4) data portability,
5) complain with the supervisory authority (https://edpb.europa.eu/about-edpb/about-edpb/members_en).

You also have a right to object to processing of your personal data for all purposes indicated above (according to the Article 21 of GDPR).

INFORMATION ABOUT VOLUNTARY OR OBLIGATORY DATA PROVISION

Providing data is voluntary, although it is necessary to participate in the Open Call. Without providing your data, it is not possible to contact you and evaluate the application.