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D4.1. SLICES RI Impact strategy and actions at SLICES-PP mid-term

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Scientific Large-scale Infrastructure for Computing Communication Experimental Studies Preparatory Phase

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Executive Summary

The deliverable D4.1 “SLICES RI Impact strategy and actions at SLICES-PP mid-term” outlined SLICES' impact creation strategy during the mid-term stage of the project, laying the groundwork for the final impact assessment report (D4.2) slated for month 40. It focused on three key areas: preliminary identification of KPIs, strategy for impact optimisation, and Sustainable Development Impact Assessment.

List of Acronyms

DOI – Digital Object Identifier
ERIC – European Research Infrastructure Consortium
ESA – European Space Agency
ESFRI – European Strategy Forum on Research Infrastructures
EUMETSAT – European Organisation for the Exploitation of Meteorological Satellites
GEO – Group on Earth Observations
GNI – Gross National Income
HR – Human Resources
IAM4SDG – Impact Assessment Methodology for Sustainable Development Goals
ICT – Information and Communication Technology
IPR – Intellectual Property Rights
ITU – International Telecommunication Union
KPI – Key Performance Indicators
LDC – Less Development Country
ODA – Official Development Assistance
O-RAN – Open Radio Access Network
R&D – Research and Development
RI – Research Infrastructure
SDG – Sustainable Development Goal
SLICES – Scientific Large-Scale Infrastructure for Computing/Communication Experimental Studies
UN – United Nations
WMO – World Meteorological Organisation
WP – Work Package

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1. Introduction

1.1. Objectives of the Work Package

The primary objective of Work Package 4 (WP4) in SLICES-PP is to enhance the impact of SLICES as a responsible organisation while systematically exploring and monitoring key performance indicators (KPIs) related to its societal impact. This comprehensive initiative will concentrate on defining and establishing monitoring processes for societal, technical, economic, environmental, and political KPIs. WP4 comprises three essential tasks. Task 4.1 is dedicated to formulating the communication strategy and KPIs for assessing both the societal and scientific impact of SLICES. Additionally, it will outline the methods for continuous impact monitoring. The groundwork laid by Task 4.1 will inform Task 4.2, which focuses on implementing the defined strategy at scientific and social levels. Task 4.2 will collaborate with target scientific communities and Digital Innovation Hubs at the local level to position SLICES-RI as a reference for innovation transfer to the industrial ecosystem. Lastly, Task 4.3, 'Environment, Climate, and Sustainable Development Impact Assessment and Optimisation,' aims to align SLICES with Sustainable Development Goals, Green Deal objectives, and climate neutrality. It will assess SLICES's impact on various SDGs, devise mitigation measures to optimise its environmental footprint, and monitor the implementation of these measures. Through these tasks, WP4 seeks to ensure SLICES's responsible and impactful presence across multiple dimensions.

1.2. Objectives of the deliverable

Deliverable D4.1, titled “SLICES-RI Impact Strategy and Actions at SLICES-PP Mid-term” serves as a crucial milestone in the comprehensive assessment of SLICES-RI's impact. This report outlines the intermediate strategy employed to gauge the impact and details the measures implemented to maximise it. The primary focus is on presenting a comprehensive overview of the strategies and actions taken during the mid-term of SLICES-PP, reflecting the ongoing efforts and progress made by the project. Additionally, this deliverable lays the foundation for D4.2, which is the subsequent report titled “SLICES-RI Impact Strategy and Actions at SLICES-PP Final”. Expected at Month 40, this report will encapsulate the final strategy employed for impact measurement and highlight all implemented measures aimed at optimising impact. Both deliverables collectively contribute to the overarching objective of Work Package 4, providing valuable insights into the impact assessment and optimisation strategies common to all tasks within SLICES-PP.

2. Scientific and Societal Impact Strategy

In the dynamic landscape of research and innovation, the pursuit of scientific and societal impact stands as a paramount objective, driving endeavours to not only advance knowledge and technology but also to catalyse positive change in communities and societies. Within the realm of SLICES, this commitment to impact creation is not only a guiding principle but a fundamental imperative.

2.1. Identification of KPIs for scientific and societal impact of SLICES

As SLICES endeavours to support and develop new technologies, services, and practices for the Next Generation Internet, it recognises the profound significance of translating these innovations into tangible benefits for society at large. From enhancing communication and networking capabilities to revolutionising data management and intelligence, the potential of SLICES to shape the future is immense. Yet, this potential can only be fully realised through a concerted effort to generate both scientific advancements and societal value.
To reach these objectives, a first series of potential Key Performance Indicators (KPIs) has been identified to measure the societal and scientific impact of SLICES. The latter have been categorised by topic to include:

A. Development of SLICES;
B. User access to SLICES;
C. Financial Indicators;
D. Training and Education;
E. Scientific and Technology Indicators;
F. Impact on Industry;
G. Influence on society at large;
H. Communication and marketing indicators.

To further refine and discuss these KPIs, and propose quantifiable targets, a dedicated working group was established in April 2024 to further discuss the scope, the concrete measures, and targets for SLICES, considering the establishment of the ERIC structure. The working group will serve as a space to discuss, revise and shape the indicators for societal and scientific impact creation for the next 3 years, with the support and feedback of all involved partners.

It is important to note that although achieving these targets does not fall under the scope of the activities in SLICES-PP, the work carried out in WP4 serves as a foundation for the

definition of the KPIs to be further followed in the ERIC. The final deliverable D4.2 'SLICES-RI Impact strategy and actions at SLICES-PP final' will consider the outcomes of the activities carried out in the working group and present the final strategy for societal and scientific impact creation, including the relevant and commonly agreed upon KPIs.

Table 1: Indicators for Impact Optimisation

A. Development of SLICES
Number of European and associated countries participating in the infrastructure
Participation in European and international projects
Number of collaborations with third countries
B. User Access to SLICES
Number of user access requests
Number of European users
Number of European countries from which user access is requested
Number of users from research infrastructure community (user community diversification)
C. Financial Indicators
Monetary value of European and international projects
Monetary value of offered access
Number of user access contracts funded by non-SLICES lead access programmes (i.e. Horizon Europe, national funding agency grants)
D. Training & Education Indicators
Growth of training/course/education modules on the SLICES Academy
Growth of usage of SLICES Academy
Number of students participating in SLICES Summer Schools
Number of Summer Schools
E. Scientific and Technological Indicators
Number of scientific events organised by SLICES & participation (conferences/workshops)
Number of joint development activities
Number of publications, patents, IPRs or products using/citing SLICES DOIs (e.g. methodologies, techniques, standards, procedures, metadata, instruments)
Joint actions with other ESFRI RIs
F. Impact on Industry Indicators
Percentage of users coming from industry
Number of regional R&D networks in which SLICES participates
Number of SLICES R&D collaborations with industry
G. Influence on Society at Large
Participation of SLICES in policy panels and forums
Internet hits (Google, social networks)
Number of public engagement events
H. Communication & Marketing Indicators

Number of newsletter subscribers
Number of events organised per national node (industry & academia)
Number of events participated in by SLICES (not organised by SLICES, e.g. trade fairs)
Collaboration with International Organisations and Standardisation Bodies
Joint actions with other ESFRI RIs

2.2. Additional impact dimensions

Contribution to the United Nations Sustainable Development Goals

According to the International Telecommunication Union (ITU) conference in 2018, ICT has the potential to significantly contribute to achieving all 17 United Nations Sustainable Development Goals (SDGs). Given this context, measures to maximise positive impacts and mitigate any negative effects on the SDGs will be carefully considered.

Firstly, this will be addressed in the current deliverable (see section 4) within the scope of SLICES-PP. This involves identifying potential harmful impacts and opportunities. Secondly, the dedicated working group 'Sustainability' will further deliberate on these matters in the context of establishing the ERIC. This will involve defining future policies for the ERIC, focusing on two key dimensions:

1) Internally, this pertains to infrastructure conception, such as reducing energy consumption through energy harvesting and anticipating waste management for upgrades and termination phases.
2) Externally, it involves planning experiments related to various verticals, including smart cities, water management, clean energy, and actions addressing climate change.

Participation in international events and collaboration with international organisations

To maximise the impact of SLICES and ensure sufficient visibility, a significant emphasis will be placed on participating in relevant international events. This entails organising a dedicated SLICES session on Research Infrastructures for Data Security and Privacy within the Research and Innovation Track at the Privacy Symposium, a practice already under way this year. Furthermore, SLICES is actively strengthening collaborations with international organisations, including specialised bodies of the United Nations (such as WMO and ITU) or organisations in the realm of observations like GEO, ESA, EUMETSAT.

3. Scientific and societal impact optimisation

This section describes the strategy for scientific impact optimisation we have identified for SLICES. Achieving scientific impact is not an objective confined to Task 4.2 of the project, but requires joint development also across Task 3.3 (Prioritisation of research topics) and T5.1 (User needs monitoring and refinement). This joint effort, and the resulting strategy, is depicted in Figure 1 below.

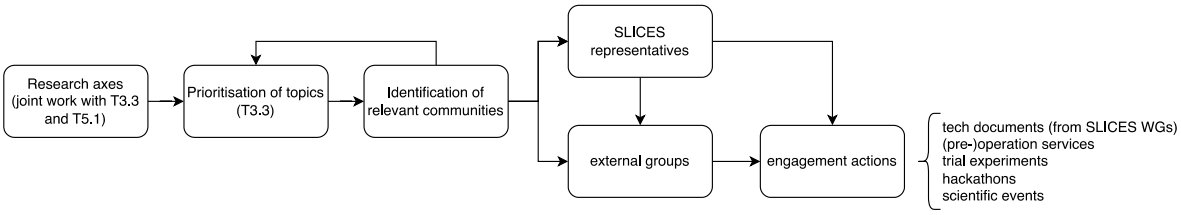

Figure 1: Elements of the Scientific Impact Methodology

From a scientific standpoint, the main strategy of SLICES is to identify research topics that are high in the priority list of the SLICES research communities, and that can benefit from an experimentally-driven research methodology. Based on this, the SLICES initiative defines key services to be developed inside the infrastructure, to support the research needs of the identified communities. In turn, these services can be composed of more fine-grained technological services, which can support in some cases multiple research communities and needs. The precise definition of this scheme is covered by Task 5.2 (Services and access strategies).

According to this process, the first element we consider is the definition of research axes that SLICES consider relevant for the general ecosystem of Digital Sciences. Research axes cover basic research topics, where communities relevant for SLICES are active. Of course, this list is always evolving, and the SLICES partners are constantly monitoring and updating it. For example, below we report a set of research axes that have been identified so far:

- Advanced wireless networking
  - New waveforms;
  - Higher frequencies up to THz;
  - Spectrum and wireless management;
  - Integrated sensing and communication;
  - Multiple heterogeneous radio management;
- Smart/intelligent infrastructure operation and management

    - Advanced protocols and architecture (virtualisation, softwerisation, programmability)
    - AI applied to infrastructure operation and optimisation at all layers;
    - Generation of data to train algorithms;
    - Distribution of intelligence into the Edge of the network;
- Design and validation of new Edge/Fog infrastructures
    - Software and components deployment;
    - Distributed resource management;
    - Geo-distributed data management;
    - Federated deep-learning;
- Emerging directions
    - Quantum communications and computing;
    - Integrated sensing and communications;
    - Pervasive AI;
- Advanced functionalities
    - Power consumption and energy efficiency;
    - Security and privacy;
    - New security issues and challenges that arise from the verticals and the ubiquitous network;
    - Interoperability, compoundable infrastructure services on-demand (RI as a Service). Seamless user;
    - Experiences across technologies and domains.

The next step in the methodology is to prioritise the topics we focus on, which serves as the basis for defining the services that the infrastructure provides to the target communities. This step of the methodology requires also the identification and interaction with the reference target communities, in a feedback loop. Typically, the output of this stage is the definition of a technological blueprint that we define. The blueprint defines the technical components that the RI must implement to support experiments of the respective target scientific community. This blueprint serves as an architectural document for each node/site of the infrastructure to deploy the related services.

As of now, examples of the identify priorities on which SLICES is active is as follows:

- *post-5G/6G network*: through the 5G blueprint, SLICES supports experimentally-driven research on disaggregated post-5G networks, leading to the transition from a monolithic 5G architecture to a modular-based post-5G architecture based on the O-RAN design approach

- *cloud-edge continuum*: through the cloud-edge blueprint, SLICES will support experimentally-driven research in the continuum from cloud to edge. This will support virtualisation of resources from the cloud to the edge and beyond, allowing for smooth service provisioning from large-scale centralised data centers, to edge platforms, to service provisioning on beyond-edge devices
- *federated and pervasive AI*: SLICES is designing support for networked pervasive AI solutions, whereby intelligence is pushed towards the edge of the network, where data typically reside, and where a multitude of devices collaboratively train models in a coordinated and cooperative way.

The identification and engagement of the respective research communities relies on two key elements:

- *SLICES representatives*: SLICES involve as key partners scientists who are actively working on each of the identified topics. The breadth of the SLICES partnerships guarantees sufficient coverage of the key research areas SLICES aims to support. For each identified community, SLICES defines appropriate Working Groups, which are tasked with the goal of defining the related blueprint for that specific topic. The SLICES representatives work as bridges between SLICES and each of the relevant research communities
- *External groups*: these are the groups of researchers not directly involved in SLICES, but in which the SLICES partners are operating, with respect to each of the identified topics. Typically, these are the reference research communities that will benefit from each of the SLICES blueprints (or equivalent "package" of services). The SLICES representative interact with those communities both by advertising the availability of the SLICES services, and gathering feedbacks on the needs and requirements, so that the services themselves can evolve

The final element of the strategy is the identification of engagement actions to maximise impact. This list largely depends on the specificity of each research community and therefore it is adapted accordingly. In general, the key elements we identify for engagement are the following:

- *Technological documents*. For each blueprint (or equivalent "package" of services) we define technological documents that describe the blueprint and how to use it. This serves both internally, to guide the deployment of the services in the SLICES nodes/sites, and externally, to explain to the target research communities how to use them. An example of such technical documentation is provided with respect to the post-5G blueprint (https://doc.slices-sc.eu/blueprint/5g_blueprint.html)
- *Services*. Selected nodes/sites are identified in the SLICES consortium to implement
- the specific blueprints and offer services to the target communities. In the full operation phase, this will be the main effort of the SLICES initiative. As of now, SLICES-PP is testing this methodology in the pre-operation phase (WP6).
- *Trial experiments*. Once services are available, the related communities are triggered to

start using them. In this initial phase of the SLICES evolution, this is done via the open calls run under SLICES-SC, as well as via selected trials used to test whether the provided services correctly support the needs of the research communities. Again, in pre-operation (WP6) the SLICES-PP consortium is going to test experiments involving multiple nodes/sites, through a pan-European connectivity service.

- *Hackathons*. Similar to trial experiments, hackathons are used as a way to test the functionality of specific packages of services, exposing them to early adopters. As of now, a series of hackathons are run in the framework of SLICES-SC.
- *Scientific events*. Finally, the relevant community for a specific blueprint is also engaged via the organisation of scientific events. These have the dual purpose of (i) discussing with the communities the evolution of the blueprint with respect to the emerging needs, and (ii) showcase early examples of adoption and the results that can be obtained by using them.

According to this strategy, SLICES expects to impact significantly on the target research communities. In addition to the communities already identified and mentioned above in this section, in the lifetime of SLICES-PP we plan to address, according to this methodology, at least the following communities. In each of these cases we will go through the element of the methodology described in this section, as we are now doing for the communities already identified.

- Network security
- Satellite communications
- Quantum networking
- IoT
- Integrated sensing and communications
- Generative AI and networks
- Vehicular networks

Note that, the list of those communities is always evolving, so inevitably this will change and evolve dynamically as the project develops.

4. Sustainable Development Impact Assessment

A broad assessment establishing the project's alignment with the SDGs is a priority for SLICES. This assessment positions SLICES as a responsible player, fostering a future grounded in sustainability as outlined by Horizon Europe's 'Do No Harm' principle, which emphasises that sustainable activities should significantly contribute to environmental objectives without causing harm.

This chapter explores the project's impact and potentials. It begins with an introduction to the SDGs and their historical context, situating SLICES within this global framework. Next, it identifies the primary and secondary SDGs affected by the project, emphasising their interconnectedness and potential contributions. The IAM4SDG Methodology is then introduced and applied to SLICES, highlighting the importance of assessing both harmful impacts and opportunities to effectively analyse project results.

4.1. Introduction to the Sustainable Development Goals (SDGs)

The Sustainable Development Goals (SDGs) are 17 global targets presented and adopted by United Nations member states in September 2015 as part of the 2030 Agenda. They are a guide and a call for the international community to commit, in general terms, to themes such as eradicating poverty, fighting hunger, access to education, sustainable development, promoting gender equality, ensuring clean drinking water, promoting affordable energy sources, sustainable consumption and production, decent work, innovations in the industrial sector and infrastructure, reducing inequality, peace and building partnerships. Each goal has specific targets that must be achieved to promote sustainable development on a global scale.

The 17 SDGs are:

1) No poverty: focusing on the eradication of extreme poverty, ensuring equal rights to the poor and vulnerable, and building resilience of the poor.
2) Zero hunger: the scope is ending hunger and malnutrition and ensuring sustainable food production.
3) Good health and well-being: ensuring healthy lives, eradication of AIDS, tuberculosis, malaria and other diseases, reduction of maternal mortality, reduction of premature death.
4) Quality education: ensuring that all boys and girls receive primary and secondary education, increasing the number of young adults with relevant skills.
5) Gender equality: improving women conditions, ending all forms of discrimination and ending all forms of violence against women.

6) Clean water and sanitation: ensuring access to water and sanitation to all.
7) Affordable and clean energy: ensuring universal access to clean, affordable and sustainable energy to all.
8) Decent work and economic growth: sustaining per capita growth, promoting a global strategy to combat youth unemployment, promoting development-oriented policies.
9) Industry, innovation and infrastructure: it promotes innovation, the development of resilient infrastructures and sustainable industries.
10) Reduced inequalities: promoting social and political inclusion and reducing the inequalities between countries.
11) Sustainable cities and communities: ensuring access for all to adequate and affordable housing, promoting sustainable cities urbanisation.
12) Responsible consumption and production: achieving sustainable management of natural resources, reducing waste generation.
13) Climate action: including climate change measures in national policies, enhancing education and awareness-raising on climate change issues.
14) Life below water: ensuring a sustainable use of oceans, seas and marine resources.
15) Life on land: halting biodiversity loss, halting desertification, halting land degradation and managing forests in a sustainable way.
16) Peace, justice and strong institutions: developing transparent institutions, developing inclusive societies and communities reducing all forms of violence, ending abuses.
17) Partnership for the goals: reinforcing the global partnership for sustainable development.

Figure 2: The 17 The Sustainable Development Goals (SDGs)[1]

[1] United Nations. (n.d.). Communications Materials - United Nations Sustainable Development. Retrieved from https://www.un.org/sustainabledevelopment/news/communications-material/

In addition to the 17 SDGs, it is important to note that each goal is supported by a set of targets. Overall, there are 169 targets that stimulate international action in critical areas. Each target has between 1 and 3 indicators used to measure progress toward reaching the targets. In total, there are 231 approved unique indicators that will measure compliance.[2]

4.2. SLICES and the SDGs

SLICES is part of the challenging landscape of research into digital infrastructures, playing a fundamental role in designing the Next Generation Internet through transformative solutions integrated with sustainable development initiatives. SLICES is part of the contemporary trend of understanding development based on integrated goals and solutions, in which technological progress is linked to advances in social issues and environmental protection. In this way, SLICES aligns with the benchmarks for this integration: the Sustainable Development Goals.

As a project that cooperates with the SDGs, SLICES advances the development of sustainable and accessible digital infrastructures, impacting diverse and interdependent sectors such as education, technology, and governance. SLICES proposes an integrated approach that goes beyond technological challenges and also seeks to contribute to building a more sustainable world concerned with protecting the environment.

4.2.1. Key SDGs addressed in SLICES

Of the 17 SDGs, SLICES addresses eleven, recognising both the harmful impacts that need mitigation and the numerous opportunities for action associated with them. This underscores SLICES' sustainable commitment, which is continually reaffirmed and validated throughout the project through the application of the IAM4SDG methodology.

[2] United Nations. (n.d.). Sustainable Development Goals Indicators: Indicators List. United Nations Statistics Division. Retrieved from https://unstats.un.org/sdgs/indicators/indicators-list/

Figure 3: SDGs Covered by SLICES-RI

The primary Sustainable Development Goals (SDGs) identified by IAM4SDGs for SLICES-RI encompass SDGs 4, 5, 6, 7, and 9, indicating a heightened degree of impact on these objectives. These selected SDGs signify areas where SLICES-RI's activities have the potential to effectuate substantial change or face significant challenges. Conversely, secondary attention is allocated to SDGs 8, 10, 11, 12, 13, and 17, denoting their relative importance in the context of SLICES-RI's mission and objectives.

Annex A presents these relevant SDGs and corresponding goals and targets, as per the United Nations.[3]

[3] United Nations. (n.d.). Sustainable Development Goals. United Nations. Retrieved April 27, 2024, from https://sdgs.un.org/goals

4.2.2. Interconnections between the SDGs

In the multifaceted SDG landscape, SLICES embodies an interconnected approach, directly engaging with a spectrum of goals, including SDGs 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 17. By investigating the complexities of each SDG, SLICES presents and analyses a network of opportunities and harmful impacts, charting a course for a sustainable and impactful implementation in which the interconnection aspect is a guiding thread.

For example, SDG 4 highlights the central role of education and the construction of digital infrastructure by SLICES facilitates access to quality education, linking directly with SDG 9's emphasis on industry, innovation and infrastructure. Similarly, SDG 5's focus on gender equality resonates with SLICES as it strives to strengthen female participation, contributing to the broader goal of reducing inequalities (SDG 10).

Challenges such as water conservation (SDG 6) present opportunities for SLICES to integrate smart technologies, promoting collaboration with projects dedicated to technology-related water savings and reinforcing sustainable practices. Furthermore, SLICES' holistic approach towards sustainable communities (SDG 11) involves the modernisation of infrastructure and the integration of renewable energy, aligning with SDG 7's focus on clean and affordable energy.

It is also important to consider that SDG 12's emphasis on responsible consumption and production is echoed in SLICES, as it promotes sustainable consumption patterns and innovative production processes throughout its life cycle. Additionally, SLICES' collaborative efforts with developing countries (SDG 17) strengthen global partnerships, accelerating the development of solutions to shared challenges such as climate change (SDG 13).

SLICES is deeply embedded in the holistic framework of the SDGs, actively working to reinforce these interconnected characteristics. It provides opportunities for actions that underscore these linkages, offering solutions that not only address individual SDGs but also generate a multiplier effect by impacting multiple goals simultaneously.

4.3. SDG impact assessment

This section introduces the IAM4SDGs methodology, establishes its connection to the SDGs and outlines how the methodology is applied in the SLICES project.

Why make an SDG Impact Assessment?
The evaluation of the project's impact on the SDGs is crucial for understanding its potential effects. This understanding can inform the consortium to optimise the project's positive contribution to the SDGs, or conversely, to mitigate any adverse impacts. Such an assessment aligns with the objectives outlined in the 2030 Agenda and the European Green Deal, which are pivotal frameworks for transitioning Europe into a climate-neutral continent in the forthcoming years. Research initiatives within the EU that prioritise economic, social, and environmental sustainability present an ideal avenue for realising tangible outcomes in these domains and translating them into action.

About the IAM4SDG Methodology
The determining factor ensuring the ongoing alignment of SLICES with the SDGs the "Impact Assessment Methodology for Sustainable Development Goals" (IAM4SDGs). Mandat International and IoT Lab designed this methodology during the development of the NAIADES Horizon 2020 research project, and its complete text is available in D2.3. IAM4SDGs holds the potential for broader application in future projects, such as SLICES, but is adaptable for use in any project aiming to assess its impact on the SDGs.

IAM4SDGs is a formal and structured methodology that enables the systematic evaluation of a project's potential positive and negative impacts on the SDGs. The methodology further helps in creating a practical action plan that aligns the project's activities with the SDGs.

Additionally, IAM4SDGs can also promote awareness about SDG requirements in a project.

The IAM4SDGs methodology follows two main principles. Firstly, it identifies and tackles potential harmful impacts of the project across all 17 SDGs. Secondly, it aims to pinpoint and enhance opportunities, thereby supporting the effectiveness, implementation, and attainment of the SDGs. What sets IAM4SDGs apart from traditional environmental impact assessments is its holistic evaluation, that also covers social, economic, and legal aspects related to a project. Moreover, it does not only focus on harmful impacts but also considers potential positive outcomes and impact on a wide spectrum of social, economic, and

environmental objectives. The methodology is developed in six sequential phases, as illustrated in the figure below. In the context of this deliverable, we have finalised phase 5.

Figure 4: The Six Phases of IAM4SDGs

Application of the IAM4SDG Methodology in SLICES

The application of the IAM4SDGs methodology in SLICES involved three workshops with SLICES-PP consortium partners to delve into the harmful impacts, opportunities, and potential action plans associated with each of the 17 SDGs. During these workshops, all the SDGs were presented along with their indicators, and consortium partners were tasked with identifying potential harmful impacts and opportunities within their respective work packages and tasks. Additionally, they assessed the magnitude of impact and likelihood for harmful impacts, or the effort required and magnitude for opportunities, to determine priority levels.

One of these workshops took place physically during the SLICES-PP plenary meeting in Amsterdam in April 2023, while the other two were conducted remotely. This approach allowed for comprehensive discussions and collaboration among the partners, ensuring that all perspectives and insights were considered in the identification and prioritisation of harmful impacts and opportunities related to the SDGs. Furthermore, one or multiple leaders have been designated for each item based on their respective roles within the project or in the ERIC working committees. The inputs have first been presented to the INRIA coordination team, reviewed, and approved, and next to the whole SLICES-PP Consortium.

At present, SLICES-PP is actively involved in crafting governance regulations for the ERIC. This offers a timely opportunity to utilise the identified harmful impacts and opportunities in shaping the future governance of SLICES. These items will form the bedrock for discussions in dedicated working group on Sustainability and the various working committees pertaining to the establishment of the ERIC, facilitating the formulation of pertinent rules and guidelines. Furthermore, certain items directly correlate with SLICES-RI's ongoing activities and will consequently be addressed within the purview of SLICES-PP.

During the latter part of the project, the partners will actively address the identified impacts, with the outcomes documented in the final deliverable D4.2. Progress will be continuously monitored to ensure effective mitigation strategies and impactful contributions.

4.3.1. SLICES results

This section of the report focuses on the outcomes of implementing the IAM4SDGs methodology within SLICES-RI. It is crucial to understand that the testing of IAM4SDGs was first and foremost a brainstorming analytical exercise than a rigid action plan. It showcases how partners assessed the project's impact on the SDGs and proposed relevant actions to mitigate harmful impacts and optimise the project's benefits toward achieving the SDGs.

Identified harmful impacts

For SLICES-RI, IAM4SDGs pinpointed harmful impacts associated with 8 out of the 17 SDGs, with only one categorised as high priority. The subsequent sections provide a comprehensive overview of these harmful impacts, accompanied by their respective mitigation priority levels. Each section outlines specific steps aimed at mitigating the identified items, including deadlines, progress updates, and the individuals responsible for overseeing the mitigation efforts.

High Priority

The testing of the IAM4SDGs methodology enabled the SLICES-RI to identify only one high-priority harmful impact overall, which is related to **SDG 7: Affordable and Clean Energy**:

The intensive usage of research infrastructure in SLICES projects may lead to excessive energy consumption.

To minimise this risk, marked as high magnitude and medium likelihood, a possible action plan identified by the partners is to deploy smart energy monitoring systems to track and analyse energy consumption patterns in real-time, enabling proactive energy management and identifying areas for optimisation.

SDG #	Harmful Impacts	Magnitude	Likelihood	Priority
7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	The intensive usage of research infrastructure in SLICES projects may lead to excessive energy consumption.	**High**	**Medium**	**High**

Priority Level	SDG #	Harmful Impacts	Identified Action	Leader	Deadline
High	7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	The intensive usage of research infrastructure in SLICES projects may lead to excessive energy consumption.	Deploy smart energy monitoring systems to track and analyse energy consumption patterns in real-time, enabling proactive energy management and identifying areas for optimization.	INRIA	M-36

Medium Priority

Additionally, the methodology also identified two medium-priority harmful impacts related to **SDG 4 Quality Education**. These include:

1. The research infrastructure SLICES faces the risk of insufficient resources and an excessive number of users, resulting in limited availability of mobility grants and access to remote utilisation.

To address the harmful impact, an identified action consists in the development of clear and objective criteria for awarding mobility grants and prioritised projects that align with strategic objectives and demonstrate potential for high-impact research results.

2. There is a possibility that the SLICES academy may not be accessible to users who require it.

A possible mitigation action regarding SDG 4 consists in increasing communication campaigns to reach broader targets.

3. Due to limited resources, it is necessary to narrow down the scope of education topics. However, a disadvantage of this approach is that the selection of topics becomes subjective.

The proposed course of action consists in conducting a comprehensive needs assessment to identify the most relevant and pressing education topics based on the requirements and interests of the target audience.

SDG #	Harmful Impacts	Magnitude	Likelihood	Priority
4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	The research infrastructure SLICES faces the risk of insufficient resources and an excessive number of users, resulting in limited availability of mobility grants and access to remote utilization.	**Medium**	**Medium**	**Medium**
4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	There is a possibility that the SLICES academy may not be accessible to users who require it.	**Medium**	**Medium**	**Medium**
4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Due to limited resources, it is necessary to narrow down the scope of education topics. However, a disadvantage of this approach is that the selection of topics becomes subjective.	**Medium**	**Medium**	**Medium**

Priority Level	SDG #	Harmful Impacts	Identified Action	Leader	Deadline
Medium	4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	The research infrastructure SLICES faces the risk of insufficient resources and an excessive number of users, resulting in limited availability of mobility grants and access to remote utilization.	Mobility Grant Allocation Criteria: Develop clear and objective criteria for mobility grant allocation. Prioritize projects that align with SLICES' strategic goals and demonstrate potential for high-impact research outcomes.	CNR	M-36
Medium	4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	There is a possibility that the SLICES academy may not be accessible to users who require it.	Increased communication campaigns to reach broader targets.	MI	M-36
Medium	4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Due to limited resources, it is necessary to narrow down the scope of education topics. However, a disadvantage of this approach is that the selection of topics becomes subjective.	Conduct a comprehensive needs assessment to identify the most relevant and pressing education topics based on the requirements and interests of the target audience.	UC3M, UTH	M-36

Regarding **SDG 5 Gender Equality**, SLICES identifies one medium-level harmful impact, namely the fact that:

<u>There is insufficient representation of women involved in SLICES.</u>

This can be mitigated by including a dedicated segment on gender equality within the HR deliverable and formulating a comprehensive human resources policy.

SDG #	Harmful Impacts	Magnitude	Likelihood	Priority
5 Gender Equality Achieve gender equality and empower all women and girls	There is an insufficient representation of women involved in SLICES	**Medium**	**Medium**	**Medium**

Priority Level	SDG #	Harmful Impacts	Identified Action	Leader	Deadline
Medium	5 Gender Equality Achieve gender equality and empower all women and girls	There is an insufficient representation of women involved in SLICES	Incorporating a dedicated segment on gender equality within the HR deliverable and formulating a comprehensive human resources policy.	UVA, INRIA, SU	M-36

The medium priority harmful impacts identified concerning **SDG 6 Clear Water and Sanitation** are:

1. <u>There is a harmful impact of overconsumption of water for the purpose of cooling data centres.</u>

   This issue can be addressed by implementing efficient cooling solutions, such as using hot/cold aisle containment, airflow management, and advanced cooling technologies, to reduce the energy requirements for data centre cooling.

2. <u>There is a harmful impact associated with an excessive utilisation of water in the manufacturing process of hardware used in SLICES.</u>

To address this item, SLICES proposes to:

- Install water meters at key points in the hardware manufacturing process to accurately measure and monitor water usage. This allows for the identification of high-consumption areas and facilitates targeted water conservation efforts.
- Utilise real-time monitoring systems to continuously track water consumption during hardware manufacturing. This enables prompt identification of abnormal usage patterns or inefficiencies, prompting timely interventions for optimisation.
- Establish benchmarks for water consumption in hardware manufacturing based on industry standards and best practices. Regularly compare actual water usage against these benchmarks to identify areas where water consumption can be reduced.

SDG #	Harmful Impacts	Magnitude	Likelihood	Priority
6 Clean Water and Sanitation Ensure access to water and sanitation for all	There is a risk of overconsumption of water for the purpose of cooling data centers.	**Medium**	**Medium**	**Medium**
6 Clean Water and Sanitation Ensure access to water and sanitation for all	There is a risk for an excessive utilisation of water in the manufacturing process of hardware used in SLICES.	**Medium**	**Medium**	**Medium**

Priority Level	SDG #	Harmful Impacts	Identified Action	Leader	Deadline
Medium	6 Clean Water and Sanitation Ensure access to water and sanitation for all	There is a risk of overconsumption of water for the purpose of cooling data centers.	Implement efficient cooling solutions, such as using hot/cold aisle containment, airflow management, and advanced cooling technologies, to reduce the energy requirements for data center cooling.	INRIA	M-36
Medium	6 Clean Water and Sanitation Ensure access to water and sanitation for all	There is a risk for an excessive utilisation of water in the manufacturing process of hardware used in SLICES.	Water Metering: Install water meters at key points in the hardware manufacturing process to accurately measure and monitor water usage. This allows for the identification of high-consumption areas and facilitates targeted water conservation efforts. Real-time Monitoring: Utilize real-time monitoring systems to continuously track water consumption during hardware manufacturing. This enables prompt identification of abnormal usage patterns or inefficiencies, prompting timely interventions for optimization.	INRIA	M-36

Additionally, IAM4SDGs revealed two medium-priority harmful impacts for progress towards **SDG 12 Responsible Consumption and Production**. These include:

1. Lack of guidelines about what to do with the hardware at the end of the project. A mitigation action consists in developing a comprehensive roadmap for post-project hardware management. This roadmap should outline the steps and procedures to follow once the project concludes, including options for re-purposing, recycling, or disposing of the hardware responsibly.

2. <u>The hardware needs to be renewed regularly in SLICES-RI, which can create additional waste. Currently there is no policy yet about how to recycle.</u>
   Considering this harmful impact, the SLICES-RI proposal is to integrate the recycling guidelines into the project's policies and procedures. Establish protocols for systematically recycling hardware at the end of its lifecycle, including procedures for data wiping and secure disposal of sensitive information.

SDG #	Harmful Impacts	Magnitude	Likelihood	Priority
12 Responsible Consumption and Production Ensure sustainable consumption and production patterns	Lack of guidelines about what to do with the hardware at the end of the project.	**Medium**	**Medium**	**Medium**
12 Responsible Consumption and Production Ensure sustainable consumption and production patterns	The hardware needs to be renewed regularly in SLICES, which can create additional waste. Currently there is no policy yet about how to recycle.	**Medium**	**Medium**	**Medium**

Priority Level	SDG #	Harmful Impacts	Identified Action	Leader	Deadline
Medium	12 Responsible Consumption and Production Ensure sustainable consumption and production patterns	Lack of guidelines about what to do with the hardware at the end of the project.	Develop a comprehensive roadmap for post-project hardware management. This roadmap should outline the steps and procedures to follow once the project concludes, including options for repurposing, recycling, or disposing of the hardware responsibly.	CNR	M-36
Medium	12 Responsible Consumption and Production Ensure sustainable consumption and production patterns	The hardware needs to be renewed regularly in SLICES, which can create additional waste. Currently there is no policy yet about how to recycle.	Integrate the recycling guidelines into the project's policies and procedures. Establish protocols for systematically recycling hardware at the end of its lifecycle, including procedures for data wiping and secure disposal of sensitive information.	CNR	M-36

The medium harmful impacts identified concerning **SDG 13 Climate Action** is:

<u>There is a lack of awareness of the environmental impact of SLICES. There is an environmental footprint, but neither the dimension or real impact has been evaluated.</u>

Given this, it is suggested to:

- Follow on this activity in a dedicated call (for example GreenDIGIT) to specifically investigate and evaluate the environmental impact of SLICES-RI. This call should encourage researchers, experts, and relevant stakeholders to contribute to the assessment and provide insights into the environmental aspects of SLICES.
- Conduct a thorough environmental impact assessment of SLICES-RI, considering its entire lifecycle, from infrastructure development to operational phases. This assessment should evaluate the potential environmental risks and impacts associated with SLICES, including energy consumption, waste generation, carbon emissions, water usage, and any other relevant factors.

SDG #	Harmful Impacts	Magnitude	Likelihood	Priority
13 Climate Action Take urgent action to combat climate change and its impacts	There is a lack of awareness of the environmental impact of SLICES. There is an environmental footprint, but neither the dimension or real impact has been evaluated.	**Medium**	**Medium**	**Medium**

Priority Level	SDG #	Harmful Impacts	Identified Action	Leader	Deadline
Medium	13 Climate Action Take urgent action to combat climate change and its impacts	There is a lack of awareness of the environmental impact of SLICES. There is an environmental footprint, but neither the dimension or real impact has been evaluated.	TRANSFER: Dedicated SLICES Call: Initiate a dedicated call within SLICES (Green DIGIT) to specifically investigate and evaluate the environmental impact of the initiative. This call should encourage researchers, experts, and relevant stakeholders to contribute to the assessment and provide insights into the environmental aspects of SLICES. Environmental Impact Assessment: Conduct a thorough environmental impact assessment of SLICES, considering its entire lifecycle, from infrastructure development to operational phases. This assessment should evaluate the potential environmental risks and impacts associated with SLICES, including energy consumption, waste generation, carbon emissions, water usage, and any other relevant factors."	UVA, IoT Lab, MI, Inria, GREEN DIGIT	M-36

Finally, pertaining to **SDG 16 Peace, Justice, and Strong Institutions**, one medium-level harmful impact has been identified, namely:

The convergence of dual-use technology and artificial intelligence poses a significant risk within the realm of SLICES. Presently, there is a lack of comprehensive guidelines addressing the concept of dual-use technology, its utilisation, and its associated limitations.

To mitigate this, the SLICES proposal is implementing an ethical board comprised of both SLICES members and external individuals such as lawyers, journalists, and representatives from the general public, which would serve to validate the dual-use/grey zone cases and establish guidelines to mitigate associated risks.

SDG #	Harmful Impacts	Magnitude	Likelihood	Priority
16 Peace, Justice and Strong Institutions Promote just, peaceful and inclusive societies	The convergence of dual-use technology and artificial intelligence poses a significant risk within the realm of SLICES. Presently, there is a lack of comprehensive guidelines addressing the concept of dual-use technology, its utilisation, and the associated limitations.	**Medium**	**Medium**	**Medium**

Priority Level	SDG #	Harmful Impacts	Identified Action	Leader	Deadline
Medium	16 Peace, Justice and Strong Institutions Promote just, peaceful and inclusive societies	The convergence of dual-use technology and artificial intelligence poses a significant risk within the realm of SLICES. Presently, there is a lack of comprehensive guidelines addressing the concept of dual-use technology, its utilisation, and the associated limitations.	Implementing an ethical board comprised of both SLICES members and external individuals such as lawyers, journalists, and representatives from the general public, would serve to validate the dual-use/grey zone cases and establish guidelines to mitigate associated risks.	UCLAN	M-36

Low Priority

Regarding low priority harmful impacts, IAM4SDGs revealed a low-priority item related to achieving **SDG 5 Gender Equality**, which is:

In SLICES, there is a concern regarding discriminatory hiring practices that prioritise gender over qualifications.

To proactively address this harmful impact, the identified actions are to:

- establish a clear and comprehensive equal opportunity policy that promotes fairness and prohibits any form of discrimination in the hiring process. Ensure that all hiring decisions are based solely on qualifications, skills, experience, and merit.
- review and update job descriptions and criteria to ensure they are unbiased and focus on the essential qualifications and competencies required for the positions. Avoid any language or requirements that may inadvertently favour or exclude any gender.

SDG #	Harmful Impacts	Magnitude	Likelihood	Priority
5 Gender Equality Achieve gender equality and empower all women and girls	In SLICES, there is a concern regarding discriminatory hiring practices that prioritize gender over qualifications.	**Medium**	**Low**	**Low**

Priority Level	SDG #	Harmful Impacts	Identified Action	Leader	Deadline
Low	5 Gender Equality Achieve gender equality and empower all women and girls	In SLICES, there is a concern regarding discriminatory hiring practices that prioritize gender over qualifications.	Equal Opportunity Policy: Establish a clear and comprehensive equal opportunity policy that promotes fairness and prohibits any form of discrimination in the hiring process. Ensure that all hiring decisions are based solely on qualifications, skills, experience, and merit. Unbiased Job Descriptions and Criteria: Review and update job descriptions and criteria to ensure they are unbiased and focus on the essential qualifications and competencies required for the positions. Avoid any language or requirements that may inadvertently favor or exclude any particular gender.	UVA, INRIA, SU	M-36

Additionally, a low-priority priority harmful impact was identified regarding **SDG 9 Industry, Innovation and Infrastructure**:

The lack of adoption of the SLICES-RI may be due to technology issues or an unalignment of needs and requirements of end-users.

To reduce it, the SLICES proposal entails leveraging the Advisory Board consisting of representatives from the research community, industry, and relevant organisations. The board's expertise and guidance will help steer SLICES-RI development in line with user requirements.

SDG #	Harmful Impacts	Magnitude	Likelihood	Priority
9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	Lack of adoption of the SLICES-RI may be due to technology issues or an inalignment of needs and requirements of end-users.	**Low**	**Low**	**Low**

Priority Level	SDG #	Harmful Impacts	Identified Action	Leader	Deadline
Low	9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	Lack of adoption of the SLICES-RI may be due to technology issues or an inalignment of needs and requirements of end-users.	Advisory Board: The Advisory Board consisting of representatives from the research community, industry, and relevant organizations. The board's expertise and guidance will help steer SLICES-RI development in line with user requirements.	PNSC	M-36

Identified opportunities/positive impacts

IAM4SDGs has revealed opportunities and positive impacts related to 10 out of 17 SDGs. The sections below elaborate on the opportunities as well as the priority level at which they should be addressed. The identified actions are described along with the deadline, status, and responsible leaders.

High priority

First, the activities within SLICES align and offer high priority opportunities related to **SDG 4 Quality Education**, such as:

1. Ensuring inclusivity of the SLICES academy by making it accessible to all individuals, regardless of their location or background.

Considering this opportunity, the following actions were identified:

- Virtual participation: Organise virtual sessions or webinars as part of the SLICES academy to allow individuals who are unable to physically attend the opportunity to participate remotely. Virtual sessions can include live streaming of presentations, interactive Q&A sessions, and online collaboration tools to engage attendees from different locations.
- Diverse speakers and topics: Curate a diverse range of speakers and topics that reflect the interests and perspectives of a broad audience. Representation of different backgrounds, expertise, and experiences among speakers will create a more inclusive learning environment.

2. The establishment of SLICES Summer Schools with the objective of fostering educational opportunities.

Considering this opportunity, the following actions were identified:

- Curriculum development: Develop a comprehensive and diverse curriculum for SLICES Summer Schools that covers various aspects of future ICT technologies, including networking, computing, cloud technologies, edge computing, and application domains. Ensure that the curriculum aligns with the latest advancements and industry trends to provide participants with cutting-edge knowledge.
- Engage expert instructors: Invite experts and renowned professionals in the field of future ICT technologies to serve as instructors and mentors during the Summer Schools. Their expertise and experience will enrich the learning experience and provide valuable insights to the participants.
- Target diverse participants: Design the Summer Schools to be inclusive and accessible to participants from different backgrounds, including students, researchers, industry professionals, and individuals from under-represented communities. Encouraging diversity among participants will foster a more dynamic and inclusive learning environment.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Ensuring inclusivity of the SLICES academy by making it accessible to all individuals, regardless of their location or background.	**High**	**Low**	**High**
4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	The establishment of SLICES Summer Schools with the objective of fostering educational opportunities.	**High**	**Medium**	**High**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
High	4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Ensuring inclusivity of the SLICES academy by making it accessible to all individuals, regardless of their location or background.	Virtual Participation: Organize virtual sessions or webinars as part of the SLICES academy to allow individuals who are unable to physically attend the opportunity to participate remotely. Virtual sessions can include live streaming of presentations, interactive Q&A sessions, and online collaboration tools to engage attendees from different locations. Diverse Speakers and Topics: Curate a diverse range of speakers and topics that reflect the interests and perspectives of a broad audience. Representation of different backgrounds, expertise, and experiences among speakers will create a more inclusive learning environment.	UC3M, UTH	M-36
High	4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	The establishment of SLICES Summer Schools with the objective of fostering educational opportunities.	Curriculum Development: Develop a comprehensive and diverse curriculum for SLICES Summer Schools that covers various aspects of future ICT technologies, including networking, computing, cloud technologies, edge computing, and application domains. Ensure that the curriculum aligns with the latest advancements and industry trends to provide participants with cutting-edge knowledge. Engage Expert Instructors: Invite experts and renowned professionals in the field of future ICT technologies to serve as instructors and mentors during the Summer Schools. Their expertise and experience will enrich the learning experience and provide valuable insights to the participants. Target Diverse Participants: Design the Summer Schools to be inclusive and accessible to participants from different backgrounds, including students, researchers, industry professionals, and individuals from underrepresented communities. Encouraging diversity among participants will foster a more dynamic and inclusive learning environment.	CNR, UTH, Eurecom	M-36

In respect to **SDG 5 Gender Equality**, it was possible to identify two opportunities:

1. <u>Ensuring the representation of women in SLICES-RI by including a section on gender equality in the HR deliverable and creating a human resources policy.</u>
   Associated with this opportunity, the following action was identified: Incorporating a dedicated segment on gender equality within the HR deliverable and formulating a comprehensive human resources policy.

2. Raising awareness on gender balance in T6.3.
   In this regard, a possible action includes incorporating a dedicated segment on gender balance within the HR deliverable and monitoring at the consortium level.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
5 Gender Equality Achieve gender equality and empower all women and girls	Ensuring the representation of women in SLICES-RI by including a section on gender equality in the HR deliverable and creating a human resources policy.	**High**	**Low**	**High**
5 Gender Equality Achieve gender equality and empower all women and girls	Raising awareness on gender balance in T6.3.	**High**	**Low**	**High**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
High	5 Gender Equality Achieve gender equality and empower all women and girls	Ensuring the representation of women in SLICES-RI by including a section on gender equality in the HR deliverable and creating a human resources policy.	Incorporating a dedicated segment on gender equality within the HR deliverable and formulating a comprehensive human resources policy.	UVA	M-36
High	5 Gender Equality Achieve gender equality and empower all women and girls	Raising awareness on gender balance in T6.3.	Incorporating a dedicated segment on gender balance within the HR deliverable and monitoring at the consortium level.	INRIA, SU	M-36

The methodology also allowed identifying two high priority opportunities regarding the **SDG 7 Affordable and Clean Energy**:

1. Create a detailed plan for integrating green networking infrastructure, such as photovoltaic farms, into SLICES, considering individual implementation and addressing potential budgetary constraints.

The identified actions by SLICES on how to implement this opportunity are to:

- conduct a comprehensive assessment of SLICES' energy needs and the potential for integrating green networking infrastructure. Identify suitable locations for photovoltaic farms and evaluate their potential energy generation capacity.
- conduct a feasibility study to determine the technical viability and cost-effectiveness of implementing photovoltaic farms within SLICES. Assess the available space, solar exposure, and grid connection requirements.

2. Establish a comprehensive plan for supporting infrastructure that promotes energy savings and efficiency to significantly reduce the energy consumption of SLICES infrastructures.

To capitalise on this opportunity, the proposed action is to incorporate energy-efficient architectural design principles into the planning and construction of new research facilities or the refurbishment of current ones. This involves utilising sustainable materials, maximising natural lighting, and adopting passive cooling and heating strategies.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	Create a detailed plan for integrating green networking infrastructure, such as photovoltaic farms, into SLICES, considering individual implementation and addressing potential budgetary constraints.	**High**	**Medium**	**High**
7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	Establish a comprehensive plan for supporting infrastructure that promotes energy savings and efficiency to significantly reduce the energy consumption of SLICES infrastructures.	**High**	**Medium**	**High**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
High	7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	Create a detailed plan for integrating green networking infrastructure, such as photovoltaic farms, into SLICES, considering individual implementation and addressing potential budgetary constraints.	Initial Assessment: Conduct a comprehensive assessment of SLICES' energy needs and the potential for integrating green networking infrastructure. Identify suitable locations for photovoltaic farms and evaluate their potential energy generation capacity. Feasibility Study: Conduct a feasibility study to determine the technical viability and cost-effectiveness of implementing photovoltaic farms within SLICES. Assess the available space, solar exposure, and grid connection requirements.	INRIA	M-36
High	7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	Establish a comprehensive plan for supporting infrastructure that promotes energy savings and efficiency to significantly reduce the energy consumption of SLICES infrastructures.	Energy-Efficient Architectural Design: Integrate energy-efficient architectural design principles into the planning and construction of new research facilities or the renovation of existing ones. Utilize sustainable materials, optimize natural lighting, and implement passive cooling and heating strategies.	INRIA	M-36

Moreover, a high-priority opportunity concerning **SDG 8 Decent Work and Economic Growth** has been identified:

<u>Suggesting initiatives for capacity building and human resource development policies.</u>

SLICES has outlined several actions to support this opportunity:

1. Organise regular training sessions and workshops for researchers and staff to enhance their skills and expertise in areas relevant to SLICES' objectives. These sessions may cover technical training on advanced ICT technologies, research methodologies, project management, and communication skills.
2. Offer internship opportunities to students and early-career researchers, providing them with practical experience and exposure to cutting-edge research within SLICES. These internships can serve as a talent pipeline and encourage young individuals to pursue careers in relevant domains.

3. Implement diversity and inclusion policies that promote equal opportunities for researchers from diverse backgrounds and underrepresented communities. A diverse workforce fosters creativity, innovation, and a broader range of perspectives.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
8 Decent Work and Economic Growth Promote inclusive and sustainable economic growth, employment and decent work for all	Suggesting initiatives for capacity building and human resource development policies.	**High**	**Low**	**High**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
High	8 Decent Work and Economic Growth Promote inclusive and sustainable economic growth, employment and decent work for all	Suggesting initiatives for capacity building and human resource development policies.	Training and Workshops: Organize regular training sessions and workshops for researchers and staff to enhance their skills and expertise in areas relevant to SLICES' objectives. These can include technical training on advanced ICT technologies, research methodologies, project management, and communication skills. Internship Opportunities: Offer internship opportunities to students and early-career researchers to gain practical experience and exposure to cutting-edge research within SLICES. Internships can serve as a talent pipeline and encourage young talents to pursue careers in relevant domains.	UC3M, CNR, INRIA, SU	M-36

Another high priority opportunity has been identified in relation to **SDG 9 Industry Innovation and Infrastructure:**

Providing research infrastructure to develop and test new technologies to access the information. SLICES will significantly increase access to information and communications technology.

To tackle this challenge, the recommended course of action is to introduce training and capacity-building initiatives for SLICES staff and researchers. These programs aim to familiarise them with the new infrastructure and technologies. Moreover, it is imperative to cultivate collaborations and partnerships with external organisations, research institutions, and technology providers. This collaborative approach will be instrumental in accessing additional expertise and resources necessary for the development of ICT infrastructure.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	Providing research infrastructure to develop and test new technologies to access the information. SLICES will significantly increase access to information and communications technology.	**High**	**Medium**	**High**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
High	9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	Providing research infrastructure to develop and test new technologies to access the information. SLICES will significantly increase access to information and communications technology.	Provide training and capacity-building programs to SLICES staff and researchers to familiarize them with the new infrastructure and technologies. Foster collaboration and partnerships with external organizations, research institutions, and technology providers to leverage additional expertise and resources in ICT infrastructure development.	CNR, IMEC	M-36

Regarding **SDG 10 Reducing Inequalities**, there is a high priority opportunity:

Define and implement inclusive human resource policies within the SLICES initiative. Inclusive human resource policies will foster collaboration, innovation, and the exchange of ideas, leading to a more vibrant and inclusive SLICES community.

Considering this opportunity, the suggested action entails conducting a comprehensive review of the current human resource policies. The objective is to identify any potential areas that may impede inclusiveness or unintentionally perpetuate bias, rectify any existing disparities, and ensure that all policies are in alignment with the principles of diversity and inclusion.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
10 Reduced Inequalities Reduce inequality within and among countries	Define and implement inclusive human resource policies within the SLICES initiative. Inclusive human resource policies will foster collaboration, innovation, and the exchange of ideas, leading to a more vibrant and inclusive SLICES community.	**High**	**Low**	**High**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
High	10 Reduced Inequalities Reduce inequality within and among countries	Define and implement inclusive human resource policies within the SLICES initiative. Inclusive human resource policies will foster collaboration, innovation, and the exchange of ideas, leading to a more vibrant and inclusive SLICES community.	Human Resource Policy Review: Conduct a thorough review of the current human resource policies to identify areas that may hinder inclusivity or inadvertently lead to bias. Address any existing disparities and ensure that all policies align with the principles of diversity and inclusion.	SU, UVA	M-36

In the context of **SDG 13 Climate Action**, two high opportunities were identified:

1. Raising awareness on sustainability within the SLICES Academy may empower researchers to develop solutions that address environmental, social, and economic challenges, ensuring a more sustainable future.

Considering this opportunity, the proposed action involves organising regular seminars and workshops centred on sustainability-related topics. These events will feature invitations extended to experts, practitioners, and thought leaders from various fields to share their knowledge, experiences, and success stories in sustainable practices.

2. By raising awareness on sustainability at the Summer School, SLICES may inspire and empower the next generation of researchers to contribute to a more sustainable future.

The action identified by SLICES to capitalise on this opportunity involves integrating sustainability-related content into the SLICES Academy's curriculum. This initiative ensures that courses, research projects, and training materials underscore the significance of sustainability in energy optimisation, provisioning, and life cycle analysis.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
13 Climate Action Take urgent action to combat climate change and its impacts	Raising awareness on sustainability within the SLICES Academy may empower researchers to develop solutions that address environmental, social, and economic challenges, ensuring a more sustainable future.	**High**	**Low**	**High**
13 Climate Action Take urgent action to combat climate change and its impacts	By raising awareness on sustainability at the Summer School, SLICES may inspire and empower the next generation of researchers to contribute to a more sustainable future.	**High**	**Low**	**High**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
High	13 Climate Action Take urgent action to combat climate change and its impacts	Raising awareness on sustainability within the SLICES Academy may empower researchers to develop solutions that address environmental, social, and economic challenges, ensuring a more sustainable future.	Sustainability Seminars and Workshops: Organize regular seminars and workshops focused on sustainability-related topics. Invite experts, practitioners, and thought leaders from diverse fields to share their knowledge, experiences, and success stories in sustainable practices.	UC3M, SU, INRIA, MI, IoT Lab	M-36
High	13 Climate Action Take urgent action to combat climate change and its impacts	By raising awareness on sustainability at the Summer School, SLICES may inspire and empower the next generation of researchers to contribute to a more sustainable future.	Sustainability Curriculum Integration: Incorporate sustainability-related content into the SLICES Academy's curriculum. Ensure that courses, research projects, and training materials emphasize the importance of sustainability in energy optimization, provisioning, and life cycle analysis.	CNR, Eurecom, Inria	M-36

Finally, two high priority opportunities regarding **SDG 17 Partnership for the Goals** were identified:

1. SLICES has the potential for collaboration with other developing countries to facilitate the replication and connectivity of its infrastructure. By leveraging webinars as a means of communication and knowledge sharing, SLICES can raise awareness about the utilisation of its infrastructure among interested parties.

The action identified by SLICES-RI to leverage this opportunity involves integrating sustainability-related content into the SLICES Academy's curriculum. This initiative ensures that courses, research projects, and training materials underscore the significance of sustainability in energy optimisation, provisioning, and life cycle analysis.

2. SLICES offers various avenues, such as the academy, training programs, and Summer Schools, to foster global collaboration. By promoting global collaboration, SLICES enhances the potential for groundbreaking research, innovation, and the development of sustainable solutions to address global challenges.

The action identified by SLICES to support this opportunity entails collaborating with representatives from developing countries to co-plan and design the content and themes of the webinar series. This collaborative approach ensures that the webinars effectively address the specific needs and challenges pertinent to these regions.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
17 Partnership for the Goals Revitalise the global partnership for sustainable development finance	SLICES has the potential for collaboration with other developing countries to facilitate the replication and connectivity of its infrastructure. By leveraging webinars as a means of communication and knowledge sharing, SLICES can raise awareness about the utilization of its infrastructure among interested parties	**High**	**Low**	**High**
17 Partnership for the Goals Revitalise the global partnership for sustainable development finance	SLICES offers various avenues, such as the academy, training programs, and Summer Schools, to foster global collaboration. By promoting global collaboration, SLICES enhances the potential for groundbreaking research, innovation, and the development of sustainable solutions to address global challenges.	**High**	**Medium**	**High**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
High	17 Partnership for the Goals Revitalise the global partnership for sustainable development finance	SLICES has the potential for collaboration with other developing countries to facilitate the replication and connectivity of its infrastructure. By leveraging webinars as a means of communication and knowledge sharing, SLICES can raise awareness about the utilization of its infrastructure among interested parties	Summer Schools and Joint Workshops: Collaborate with partner institutions to organize joint Summer Schools and workshops. These events will bring together participants from different countries to explore interdisciplinary research topics and build lasting connections.	SU, UTH, INRIA, UC3M	M-36
High	17 Partnership for the Goals Revitalise the global partnership for sustainable development finance	SLICES offers various avenues, such as the academy, training programs, and Summer Schools, to foster global collaboration. By promoting global collaboration, SLICES enhances the potential for groundbreaking research, innovation, and the development of sustainable solutions to address global challenges.	Collaborative Planning: Engage with representatives from developing countries to collaboratively plan and design the content and themes of the webinar series. This ensures that the webinars address specific needs and challenges relevant to these regions.	Eurecom	M-36

Medium Priority

The project positively contributes to **SDG 4 Quality Education** through:

Introducing mobility grants as a means of motivating young researchers to actively engage in collaboration with SLICES.

The identified actions by SLICES on how to implement this opportunity are to:

- Widen the scope of grants: Expand the eligibility criteria and scope of mobility grants to include a broader range of young researchers, such as early-career academics, postdoctoral fellows, and graduate students. This will encourage more young talents

to participate in collaborative research initiatives with SLICES.

- Attractive grant packages: Develop competitive grant packages that provide sufficient financial support to cover travel expenses, accommodation, and other associated costs. Offering attractive and comprehensive grant packages will entice young researchers to pursue collaboration opportunities with SLICES.

- Publicise success stories: Share success stories of young researchers who have benefited from mobility grants and actively engaged in fruitful collaborations with SLICES. Publicising these success stories will inspire others and showcase the positive outcomes of the opportunity.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Introduce mobility grants as a means of motivating young researchers to actively engage in collaboration with SLICES.	**Low**	**Low**	**Medium**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
Medium	4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Introduce mobility grants as a means of motivating young researchers to actively engage in collaboration with SLICES.	Widening the Scope of Grants: Expand the eligibility criteria and scope of mobility grants to include a broader range of young researchers, such as early-career academics, postdoctoral fellows, and graduate students. This will encourage more young talents to participate in collaborative research initiatives with SLICES. Attractive Grant Packages: Develop competitive grant packages that provide sufficient financial support to cover travel expenses, accommodation, and other associated costs. Offering attractive and comprehensive grant packages will entice young researchers to pursue collaboration opportunities with SLICES.	CNR	M-36

A medium priority opportunity was identified regarding **SDG 5 Gender Equality**:

Giving the visibility to women in SLICES-RI (projects and events) by ensuring gender balance (agenda, events).

Considering this opportunity, the identified action is to actively seek out and invite female experts and leaders in the field to participate in conferences, workshops, and other gatherings related to SLICES-RI initiatives. Additionally, creating guidelines for events to ensure gender-balanced agendas and panels could help to prioritise diversity and inclusion in all aspects of project-related activities.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
5 Gender Equality Achieve gender equality and empower all women and girls	Giving the visibility to women in SLICES-RI (projects and events) by ensuring gender balance (agenda, events).	**Low**	**Low**	**Medium**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
Medium	5 Gender Equality Achieve gender equality and empower all women and girls	Giving the visibility to women in SLICES-RI (projects and events) by ensuring gender balance (agenda, events).	Actively seeking out and inviting female experts and leaders in the field to participate in conferences, workshops, and other gatherings related to SLICES-RI initiatives. Additionally, creating guidelines for events to ensure gender-balanced agendas and panels could help to prioritize diversity and inclusion in all aspects of project-related activities.	MI, SU	M-36

A medium priority opportunity was identified regarding **SDG 7 Affordable and Clean Energy**:

Improving the research infrastructure comprehensively in terms of energy efficiency, encompassing aspects such as architectural design, interoperability, and spanning across all domains.

Given this opportunity, the proposed course of action entails performing a comprehensive energy audit and assessment of the research infrastructure to pinpoint energy inefficiencies and propose potential enhancements. This audit will establish a foundation for tracking progress and steering forthcoming energy-saving endeavours.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	Improving the research infrastructure comprehensively in terms of energy efficiency, encompassing aspects such as architectural design, interoperability, and spanning across all domains.	**High**	**High**	**Medium**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
Medium	7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	Improving the research infrastructure comprehensively in terms of energy efficiency, encompassing aspects such as architectural design, interoperability, and spanning across all	Energy Audit and Assessment: Conduct a thorough energy audit and assessment of the research infrastructure to identify areas of energy inefficiency and potential improvements. This audit will serve as a baseline to measure progress and guide future energy-saving initiatives.	INRIA	M-36

An opportunity of medium priority was identified concerning **SDG 8 Decent Work and Economic Growth:**

The SLICES Academy has the potential to enhance the productivity of researchers.

Given this opportunity, the actions identified are:

- Specialised training programs: The Academy can design and offer specialised training programs tailored to the needs of researchers. These programs may cover cutting-edge research methodologies, advanced data analysis techniques, and other relevant skills to enhance their expertise.
- Interdisciplinary collaboration: By bringing together researchers from diverse disciplines, the Academy fosters interdisciplinary collaboration. This cross-pollination of ideas and expertise can lead to innovative research projects and novel solutions to complex problems.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
8 Decent Work and Economic Growth Promote inclusive and sustainable economic growth, employment and decent work for all	The SLICES Academy has the potential to enhance the productivity of researchers.	**Medium**	**Medium**	**Medium**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
Medium	8 Decent Work and Economic Growth Promote inclusive and sustainable economic growth, employment and decent work for all	The SLICES Academy has the potential to enhance the productivity of researchers.	Specialized Training Programs: The Academy can design and offer specialized training programs tailored to the needs of researchers. These programs may cover cutting-edge research methodologies, advanced data analysis techniques, and other relevant skills to enhance their expertise. Interdisciplinary Collaboration: By bringing together researchers from diverse disciplines, the Academy fosters interdisciplinary collaboration. This cross-pollination of ideas and expertise can lead to innovative research projects and novel solutions to complex problems.	UC3M, CNR, SU, Eurecom	M-36

Furthermore, a medium-priority opportunity was recognised regarding SDG 9 Industry Innovation and Infrastructure

<u>Building transborder research infrastructure to facilitate the R&D of the intended resilient infrastructure.</u>

The action identified by SLICES on implementing this opportunity is to expand the SLICES community by encouraging partnerships with research institutions, universities, and organisations from different countries to collectively work on resilient infrastructure R&D projects.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	Building transborder research infrastructure to facilitate the R&D of the intended resiliant infrastructure.	**High**	**High**	**Medium**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
Medium	9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	Building transborder research infrastructure to facilitate the R&D of the intended resiliant infrastructure.	Upscaling: expand the SLICES community by encouraging partnerships with research institutions, universities, and organizations from different countries to collectively work on resilient infrastructure R&D projects.	INRIA	M-36

Another medium-priority opportunity was identified concerning **SDG 11 Sustainable Cities and Communities**:

Use case defined in SLICES-DS for this point: “Reduce number of deaths and those affected by disasters.”

The action identified by SLICES on implementing this opportunity is to disseminate the use case and its learnings to the general public.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
11 Sustainable Cities and Communities Make cities inclusive, safe, resilient and sustainable	Use case defined in SLICES-DS for this point: “Reduce number of deaths and those affected by disasters.”	**Low**	**Low**	**Medium**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
Medium	11 Sustainable Cities and Communities Make cities inclusive, safe, resilient and sustainable	Use case defined in SLICES-DS for this point: "Reduce number of deaths and those affected by disasters."	Disseminate the use case and its learnings to the general public	MI	M-36

We identified another medium-priority opportunity related to **SDG 13 Climate Action**.

Use-case in SLICES-DS on natural disasters such as climate related disasters. It can be implementable in SLICES-RI.

Given this opportunity, the action identified is to disseminate the use case and its learnings to the general public.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
13 Climate Action Take urgent action to combat climate change and its impacts	Use-case in SLICES-DS on natural disasters such as climate related disasters. It can be implementable in SLICES-RI.	**Low**	**Low**	**Medium**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
Medium	13 Climate Action Take urgent action to combat climate change and its impacts	Use-case in SLICES-DS on natural disasters such as climate related disasters. It can be implementable in SLICES-RI.	Disseminate the use case and its learnings to the general public	MI	M-36

Low Priority

An opportunity of low priority concerning **SDG 7 Affordable and Clean Energy** was identified:

Providing transparent information regarding energy measurement, including the power consumption of experiments.

With this opportunity in mind, the proposed action suggests incorporating meters into all projects (subject to approval by all stakeholders) to monitor energy/electricity consumption. This initiative aims to furnish the energy cost of experiments, facilitating future endeavours. Moreover, there would be a heightened emphasis on assessing the entire life cycle of the infrastructure we deploy and utilise.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	Providing transparent information regarding energy measurement, including the power consumption of experiments.	**Low**	**Medium**	**Low**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
Low	7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	Providing transparent information regarding energy measurement, including the power consumption of experiments.	Meters can be included in all projects (if approved by everyone) to measure energy/electricity consumption. This will provide the energy cost of an experiment and can be used in future work. There will be an increased focus on the whole life cycle of the infrastructure we will deploy and use.	INRIA	M-36

Finally, a low-priority opportunity was acknowledged concerning **SDG 9 Industry Innovation and Infrastructure**:

SLICES Summer Schools and mobility grants can facilitate fair and accessible entry to SLICES-RI, promoting equity and affordability.

Taking this opportunity into consideration, the identified actions are:

- Expansion of Summer Schools: Further expanding the number and variety of Summer Schools offered by SLICES-RI.
- Online learning platforms: Complementing the physical Summer Schools, SLICES-RI is developing online learning platforms that host educational resources, lectures, and workshops. This enables researchers who are unable to attend in-person events to access valuable knowledge and engage in virtual learning experiences.
- Long-term commitment: SLICES-RI may demonstrate its long-term commitment to equity and affordability by allocating dedicated resources and budget to support these initiatives. This commitment will be reflected in its strategic planning and mission statements.

SDG #	Identified Opportunities	Magnitude	Effort Required	Priority
9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	SLICES Summer Schools and mobility grants can facilitate fair and accessible entry to SLICES-RI, promoting equity and affordability.	**Low**	**Medium**	**Low**

Priority Level	SDG #	Opportunity	Identified Action	Leader	Deadline
Low	9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	SLICES Summer Schools and mobility grants can facilitate fair and accessible entry to SLICES-RI, promoting equity and affordability.	Expansion of Summer Schools: SLICES-RI will further expand the number and variety of Summer Schools it offers. Online Learning Platforms: Complementing the physical Summer Schools, SLICES-RI will develop online learning platforms that host educational resources, lectures, and workshops. This will enable researchers who are unable to attend in-person events to access valuable knowledge and engage in virtual learning experiences. Long-Term Commitment: SLICES-RI will demonstrate its long-term commitment to equity and affordability by allocating dedicated resources and budget to support these initiatives. This commitment will be reflected in its strategic planning and mission statements	CNR, UTH, UC3M	M-36

Results analysis

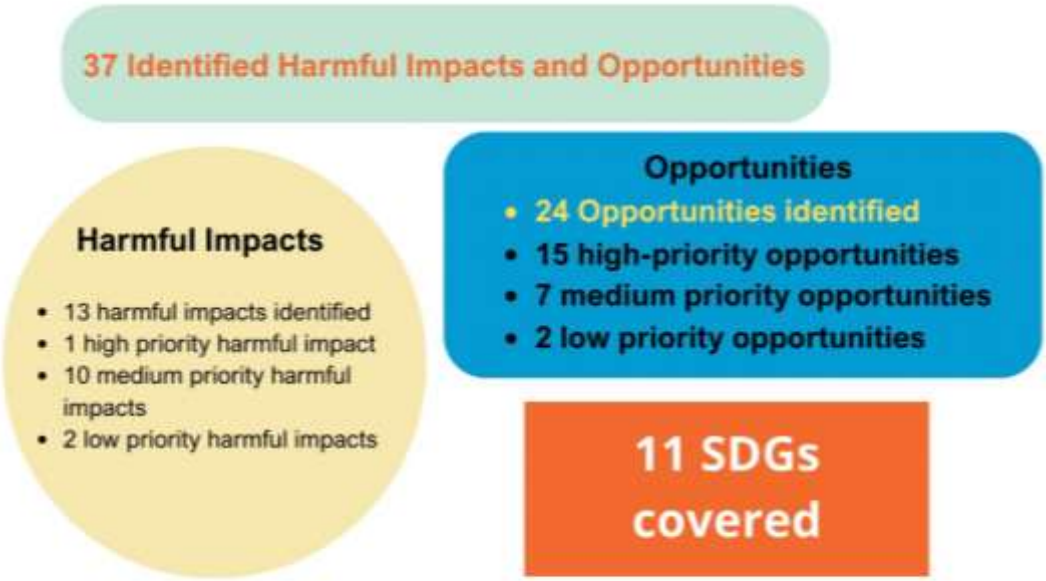

Figure 5: Simplified Overview of Results

The IAM4SDGs methodology proves highly beneficial in categorising various actions, enabling the project to prioritise the most impactful SDG objectives. Key harmful impacts and opportunities have been classified into high, medium, and low priority. In total, the SLICES-RI assesses 37 items, encompassing 13 harmful impacts and 24 opportunities.

Among these, there are 15 high-priority opportunities and 7 medium-priority ones, alongside only 1 high-priority concern. Additionally, there are 10 medium-risk and 2 low-risk factors. The table below presents a summary of identified harmful impacts and opportunities per pilot and priority level.

Table 2: Total of Harmful Impacts and Opportunities by type

Harmful Impacts				Opportunities				
Low	Medium	High	Total	High	Medium	Low	Total	Overall total
2	10	1	13	15	7	2	24	37

The subsequent comprehensive figure showcases the SDGs alongside their associated impacts and priorities. This visual representation offers an insightful overview of how the SDGs interact, the harmful impacts they entail, and the established priorities for addressing them. Linked to the previous tables, the diagram provides a clear understanding of where to direct attention and resources for maximising impact and ensuring sustainable progress across all SDGs.

Figure 6: Summary of Harmful Impacts and Opportunities in SLICES

In addressing a range of Sustainable Development Goals (SDG 4: Quality Education, SDG 5: Gender Equality, SDG 6: Clean Water and Sanitation, SDG 7: Affordable and Clean Energy, SDG 8: Decent Work and Economic Growth, SDG 9: Industry, Innovation, and Infrastructure, SDG 10: Reduced Inequalities, SDG 11: Sustainable Cities and Communities, SDG 12: Responsible Consumption and Production, SDG 13: Climate Action, and SDG 17: Partnerships for the Goals), reflecting the integrated characteristic of these objectives, SLICES-RI directly aligns with SDGs. By analysing opportunities and potential harmful impacts associated with the SDGs, this assessment helps guide the SLICES-RI towards a sustainable and impactful implementation.

Regarding SDG 4: Quality Education, the construction of digital infrastructures by SLICES-RI has a direct impact on access to education and the quality of education offered. The implementation of digital infrastructures and the design of the Next Generation Internet promote access through the dissemination of knowledge, training of professionals and communities in technological advances, in addition to the development of innovative teaching materials and training programs.

In recognising the importance of SDG 5: Gender Equality within the project, SLICES-RI actively seeks to increase female involvement in future endeavours, despite current limited female participation. Strategies like promoting greater visibility for women at events and within project teams aim to achieve a more equitable representation.

Considering SDG 6: Clean Water and Sanitation as a central concern in the development of SLICES-RI, the implementation of digital infrastructures can lead to risks of excessive water use, both in the cooling of data centres and in the manufacturing process of the hardware used in the project. These challenges are seen as an opportunity to use both smart technologies to save water and to form partnerships with aligned projects that operate in technology-related water savings.

Designed to establish a sustainable relationship with the communities involved, SLICES-RI's holistic approach envisages implementing new Internet technologies and digital infrastructures, modernising electrical grids, and integrating large-scale renewable energies, such as energy storage and smart grids. The project aims to replicate these technologies in Europe, maintaining sustainable practices as a basis and promoting synergies between academia, industry, and business actors, thus aligning with SDG 7: Affordable and Clean Energy.

Directly aligning with SDG 8: Decent Work and Economic Growth, SLICES-RI fosters job creation in R&D by constructing international research infrastructure for resilient infrastructures. Additionally, by partnering with universities and organisations globally, SLICES-RI expands its community and promotes knowledge sharing. This collaborative approach can attract further investment in this critical field.

By supporting, promoting, and facilitating innovation, SLICES-RI contributes to the development of new technologies and solutions that are allies in facing the challenges of the energy transition and building a more sustainable future, directly addressing the objectives of SDG.

Consequently, SLICES-RI significantly reinforces access to information and communication technologies (ICT) through a research infrastructure dedicated to the development and testing of new access solutions. Training programs empower staff to use this infrastructure effectively, in a way that is directly aligned with SDG 9: Industry, Innovation, and Infrastructure.

Moreover, SLICES-RI contributes to SDG 10: Reduced Inequalities by implementing inclusive human resource policies within its initiative. These policies aim to create a diverse and equitable environment, promoting collaboration, innovation, and the exchange of ideas among its community members. By prioritising inclusivity in its workforce, SLICES-RI fosters a vibrant and inclusive community where individuals from diverse backgrounds can contribute their talents and perspectives, thus reducing inequalities within the project's sphere of influence.

In relation to SDG 11: Sustainable Cities and Communities, SLICES-RI focuses on developing digital infrastructures and technologies that enhance urban sustainability. By modernising electrical grids, implementing renewable energy solutions, and integrating smart technologies, SLICES contributes to the creation of resilient and sustainable cities. These efforts aim to improve urban infrastructure, promote inclusive and sustainable urbanisation, and enhance resource efficiency, ultimately fostering safer, more inclusive, and resilient cities and communities.

Regarding SDG 12: Responsible Consumption and Production, SLICES-RI emphasises responsible consumption and production practices throughout its project lifecycle. Through the design and implementation of digital infrastructures, SLICES seeks to optimise resource use, reduce waste generation, and promote sustainable consumption patterns. By fostering innovation in energy efficiency, waste management, and sustainable production processes, SLICES supports the transition towards more sustainable consumption and production patterns, contributing to the achievement of SDG 12 targets.

Furthermore, SLICES-RI tackles SDG 13: Climate Action by empowering researchers to create solutions for a sustainable future. They achieve this through focused research and knowledge sharing initiatives. Researchers develop solutions for environmental, social, and economic challenges, while regular seminars with sustainability experts spark collaboration and accelerate the adoption of sustainable practices.

Lastly, SLICES-RI aligns with SDG 17: Partnerships for the Goals, collaborating with developing countries to share their infrastructure and knowledge. Training programs and academic partnerships seek to promote this global cooperation. This focus on collaboration strengthens research and innovation, accelerating the development of solutions to global challenges such as climate change.

5. Conclusion

This deliverable presented the impact creation strategy for SLICES in the mid-term medium stage of the project. It detailed the measures to be implemented aimed at maximising the social and scientific impact of SLICES, serving as the basis for the final impact assessment report (D4.2) scheduled for month 40.

It sought to present the strategy on three levels:

- Preliminary identification of KPIs for societal and scientific impact creation
- The strategy for impact optimisation
- Sustainable Development Impact Assessment.

First, the deliverable identified a first set of indicators to be considered for maximising the impact of SLICES. The list serves as a foundation to drive the discussions in the scope of the dedicated working group on KPIs and Impact that shapes the future of the ERIC. The results of these discussions will be presented in D4.2.

The strategy for optimising scientific impact in SLICES emphasised the importance of identifying research topics prioritised by the SLICES research communities and developing experimentally-driven methodologies to address them. This approach involved defining key services within the infrastructure to support the research needs of these communities. The identification of research axes and prioritisation of topics are integral to this strategy, ensuring alignment with the broader ecosystem of Digital Sciences.

The strategy also involves engaging with relevant research communities through SLICES representatives and external groups to gather feedback and refine services. Engagement actions include the creation of technological documents, offering services, conducting trial experiments and hackathons, and organising scientific events to showcase adoption and results.

By following this strategy, SLICES aims to significantly impact target research communities, addressing areas such as network security, satellite communications, quantum networking, IoT, integrated sensing and communications, generative AI and networks, and vehicular networks. As the project progresses, the list of targeted communities may evolve dynamically to adapt to emerging needs and developments in the field.

Finally, the analysis of the potential impact of SLICES on the SDGs, carried out using the IAM4SDG methodology, revealed valuable information. Although only one high-risk concern was identified, eight SDGs presented potential negative impacts that require mitigation strategies. These strategies, along with deadlines, status updates, and responsible leaders, have been outlined in the dedicated sections of this report.

Encouragingly, the analysis also identified positive impacts across ten SDGs, with 24 corresponding opportunities highlighted. These opportunities have been categorised based on their priority level (high, medium, and low) and detailed in dedicated sections, including action descriptions, deadlines, status updates, and responsible leaders. In sum, SLICES shows a significant positive impact overall, outweighing any negative effects. This report also identifies actions needed to further enhance this positive impact.

In conclusion, this interim report demonstrates the continuous efforts and progress made by SLICES-PP in evaluating and optimising its impact in various dimensions. In the second half of the project, additional efforts will be pursued to further refine the indicators and the strategy. Additionally, the comprehensive analysis of harmful impacts and opportunities identified through the IAM4SDG methodology provides a roadmap for continuous improvement and ensures SLICES' responsible and impactful contribution to the UN Sustainable Development Goals.

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ANNEX A – Key SDGs addressed

SDG 4: QUALITY EDUCATION

Goal #4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Increasing occurrences of war conflicts, pandemics, and worsening inequities in education have a severely negative impact on accessibility and quality of education. To address them, SDG 4 calls for the following actions:

4.1 Ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes.

4.2 Ensure that all girls and boys have access to quality early childhood development, care, and pre-primary education so that they are ready for primary education.

4.3 Ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university.

4.4 Substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

4.5 Eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations.

4.6 Ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy.

4.7 Ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development.

4.A Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all.

4.B Substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and

information and communications technology, technical, engineering, and scientific programmes, in developed countries and other developing countries.

4.C Substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States.

SDG 5: GENDER EQUALITY

Goal #5. Achieve gender equality and empower all women and girls.

Progress towards gender equality by 2030 is severely lagging, with none of the 18 global indicators meeting targets and only one nearing them. Global crises have exacerbated gender disparities in healthcare, education, and economic opportunities. SDG 5 outlines essential actions to tackle these issues:

5.1 End all forms of discrimination against all women and girls everywhere Target.
5.2 Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation.
5.3 Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation.
5.4 Recognise and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate.
5.5 Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life.
5.6 Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences.
5.A Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws.
5.B Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women.
5.C Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels.

SDG 6: CLEAR WATER AND SANITATION

Goal #6. Ensure availability and sustainable management of water and sanitation for all.

Despite progress, billions still lack access to safe water, sanitation, and hygiene, worsened by water scarcity, conflicts, and pollution. Achieving universal coverage by 2030 demands significant rate increases: 6-fold for drinking water, 5-fold for sanitation, and 8-fold for hygiene. SDG 6 outlines essential actions to tackle these challenges.

6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all.

6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.

6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally Target 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.

6.4 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.

6.5 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes Transforming our world: the 2030 Agenda for Sustainable Development A/RES/70/1 19/35.

6.A By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.

6.B Support and strengthen the participation of local communities in improving water and sanitation management.

SDG 7: AFFORDABLE AND CLEAN ENERGY

Goal #7: Ensure access to affordable, reliable, sustainable and modern energy.

SDG7 is about ensuring the access to clean and affordable energy that is crucial for economic and human development. Industries that may benefit from this are agriculture, business, communication, education, healthcare and transportation. In order to achieve sustainable energy by 2030, the following targets have been set:

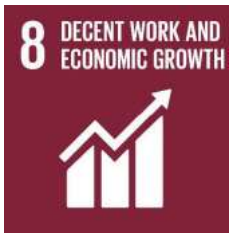
7.1 Ensure universal access to affordable, reliable and modern energy services.

7.2 Increase substantially the share of renewable energy in the global energy mix.

7.3 Double the global rate of improvement in energy efficiency.

7.A Enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.

7.B Expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support.



SDG 8: DECENT WORK AND ECONOMIC GROWTH

Goal #8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

Progress towards SDG8 faces challenges, with lingering effects of COVID-19, trade tensions, rising debts, and the Ukraine conflict threatening global economic growth. These crises jeopardise employment, income, equitable pay, and decent work. Targets for sustained economic growth by 2030 include:

8.1 Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries.

8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors.

8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalisation and growth of micro-, small- and medium-sized enterprises, including through access to financial services.

8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead.

8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.

8.6 By 2020, substantially reduce the proportion of youth not in employment, education or training A/RES/70/1 Transforming our world: the 2030 Agenda for Sustainable Development 20/35.

8.7 Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms.

8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.

8.9 By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products Target 8.10 Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all.

8.A Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade-related Technical Assistance to Least Developed Countries.

8.B By 2020, develop and operationalise a global strategy for youth employment and implement the Global Jobs Pact of the International Labour Organisation.

SDG 9: INDUSTRY, INNOVATION AND INFRASTRUCTURE

Goal #9: Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.

The manufacturing industry's COVID-19 recovery varies, with high-income regions seeing growth while LDCs lag behind. Post-pandemic data highlight the importance of inclusive innovation and technology transfer. In line with SDG 9, the targets for resilient infrastructure, inclusive industrialisation, and innovation encompass:

Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.

- 9.1 Promote inclusive and sustainable industrialisation and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries.
- 9.2 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets.
- 9.3 Upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.
- 9.4 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.
- 9.A Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States.
- 9.B Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities.

9.C Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020.

SDG 10: REDUCED INEQUALITIES

Goal #10. Reduce inequality within and among countries.

Before the pandemic, the incomes of the bottom 40% of the population grew faster than the national average in a majority of countries. The impacts of the pandemic and uneven recoveries in different regions of the world threaten to reverse that trend and further worsen global inequality. Record numbers are being forced to flee conflicts and economic hardship. To reduce inequality by 2030, the following targets have been established:

10.1 By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average.

10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status 10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard.

10.3 Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality.

10.4 Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations.

10.5 Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions.

10.6 Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies Target.

10.A Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organisation agreements.

10.B Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes.

10.C By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 percent.

SDG 11: SUSTAINABLE CITIES AND COMMUNITIES

Goal #11. Make cities and human settlements inclusive, safe, resilient and sustainable.

The pandemic altered migration, especially in cities, while climate change and conflicts hit urban areas hard. Sustainable cities goal remains distant with growing slum populations in developing nations, jeopardising housing targets by 2030. Since 2015, countries with disaster risk plans doubled. SDG 11 targets include:

10.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.

10.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.

10.3 By 2030, enhance inclusive and sustainable urbanisation and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.

10.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage.

10.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.

10.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.

10.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.

10.A Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning.

10.B By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015–2030, holistic disaster risk management at all levels.

10.CSupport least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilising local materials.

SDG 12: RESPONSIBLE CONSUMPTION AND PRODUCTION

Goal #12. Ensure sustainable consumption and production patterns.

The world is far from its goal of halving per-capita food waste and losses by 2030, with the COVID-19 pandemic disrupting consumption and production patterns. Responsible consumption and production are vital for pandemic recovery, alongside decoupling economic growth from resource use. To achieve SDG12, the following targets were established.

12.1 Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries.

12.2 By 2030, achieve the sustainable management and efficient use of natural resources.

12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.

12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment.

12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle.

12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities.

12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

12.A Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production.

12.B Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products.

12.C Rationalise inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimising the possible adverse impacts

on their development in a manner that protects the poor and the affected communities.

SDG 13: CLIMATE ACTION

Goal #13. Take urgent action to combat climate change and its impacts.

Given the climate crisis scenario, current actions and plans have been insufficient. Without transformative action initiated now and during this decade to deeply and rapidly reduce greenhouse gas emissions across all sectors, the 1.5°C target will be at risk, along with the lives of more than 3 billion people. The following targets were proposed to address SDG 13.

13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

13.2 Integrate climate change measures into national policies, strategies and planning.

13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

13.A Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilising jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalise the Green Climate Fund through its capitalisation as soon as possible.

13.B Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalised communities.

SDG 17: PARTNERSHIPS FOR THE GOALS

Goal #17. Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development Finance.

Progress on global partnerships (SDG 17) is uneven. While some areas like aid and technology see improvement, funding remains a major hurdle, especially for developing countries. Debt burdens, rising inflation, and geopolitical tensions create additional challenges. SDG 17 targets include:

17.1 Strengthen domestic resource mobilisation, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection.

17.2 Developed countries to implement fully their official development assistance commitments, including the commitment by many developed countries to achieve the target of 0.7 per cent of gross national income for official development assistance (ODA/GNI) to developing countries and 0.15 to 0.20 per cent of ODA/GNI to least developed countries; ODA providers are encouraged to consider setting a target to provide at least 0.20 per cent of ODA/GNI to least developed countries.

17.3 Mobilise additional financial resources for developing countries from multiple sources.

17.4 Assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress.

17.5 Adopt and implement investment promotion regimes for least developed countries Technology.

17.6 Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism.

17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed.

17.8 Fully operationalise the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017 and enhance the

use of enabling technology, in particular information and communications technology Capacity-building.

17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation Trade.

17.10 Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the World Trade Organisation, including through the conclusion of negotiations under its Doha Development Agenda.

17.11 Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020.

17.12 Realise timely implementation of duty-free and quota-free market access on a lasting basis for all least developed countries, consistent with World Trade Organisation decisions, including by ensuring that preferential rules of origin applicable to imports from least developed countries are transparent and simple, and contribute to facilitating market access Systemic issues Policy and institutional coherence.

17.13 Enhance global macroeconomic stability, including through policy coordination and policy coherence.

17.14 Enhance policy coherence for sustainable development Target 17.15 Respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development Multi-stakeholder partnerships.

17.15 Enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilise and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries, in particular developing countries.

17.16 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships Data, monitoring and accountability.

17.17 By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts.

17.18 By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries.

SDG	Harmful Impacts	Magnitude	Likelihood	Priority	Identified Opportunities	Magnitude	Effort Required	Priority
4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	The research infrastructure SLICES faces the risk of insufficient resources and an excessive number of users, resulting in limited availability of mobility grants and access to remote utilization.	Medium	Medium	Medium	Ensuring inclusivity of the SLICES academy by making it accessible to all individuals, regardless of their location or background.	High	Low	High

4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	There is a possibility that the SLICES academy may not be accessible to users who require it.	Medium	Medium	Medium	The establishment of SLICES Summer Schools with the objective of fostering educational opportunities.	High	Medium	High
4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Due to limited resources, it is necessary to narrow down the scope of education topics. However, a disadvantage of this approach is that the selection of topics becomes subjective.	Medium	Medium	Medium	Introduce mobility grants as a means of motivating young researchers to actively engage in collaboration with SLICES.	Low	Low	Medium

5 Gender Equality Achieve gender equality and empower all women and girls	In SLICES, there is a concern regarding discriminatory hiring practices that prioritize gender over qualifications.	Medium	Low	Low	Ensuring the representation of women in SLICES-RI by including a section on gender equality in the HR deliverable and creating a human resources policy.	High	Low	High
5 Gender Equality Achieve gender equality and empower all women and girls	There is an insufficient representation of women involved in SLICES	Medium	Medium	Medium	Giving the visibility to women in SLICES-RI (projects and events) by ensuring gender balance (agenda, events).	Low	Low	Medium

5 Gender Equality Achieve gender equality and empower all women and girls					Raising awareness on gender balance in T6.3.	High	Low	High
6 Clean Water and Sanitation Ensure access to water and sanitation for all	There is a risk of overconsumption of water for the purpose of cooling data centers.	Medium	Medium	Medium	Raising awareness and overseeing the water usage.	High	Medium	High
6 Clean Water and Sanitation Ensure access to water and sanitation for all	There is a risk for an excessive utilisation of water in the manufacturing process of hardware used in SLICES.	Medium	Medium	Medium	Enhancing the research infrastructure to improve energy efficiency, particularly by upgrading the cooling infrastructure.	High	Medium	High

7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	The intensive usage of research infrastructure in SLICES projects may lead to excessive energy consumption.	High	Medium	High	Improving the research infrastructure comprehensively in terms of energy efficiency, encompassing aspects such as architectural design, interoperability, and spanning across all domains.	High	High	Medium

7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy					Create a detailed plan for integrating green networking infrastructure, such as photovoltaic farms, into SLICES, considering individual implementation and addressing potential budgetary constraints.	High	Medium	High

7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy					Establish a comprehensive plan for supporting infrastructure that promotes energy savings and efficiency to significantly reduce the energy consumption of SLICES infrastructures.	High	Medium	High
7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy					Providing transparent information regarding energy measurement, including the power consumption of experiments.	Low	Medium	Low

8 Decent Work and Economic Growth Promote inclusive and sustainable economic growth, employment and decent work for all					Suggesting initiatives for capacity building and human resource development policies.	High	Low	High
8 Decent Work and Economic Growth Promote inclusive and sustainable economic growth, employment and decent work for all					The SLICES Academy has the potential to enhance the productivity of researchers.	Medium	Medium	Medium

9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	Lack of adoption of the SLICES-RI may be due to technology issues or an inalignment of needs and requirements of end-users.	Low	Low	Low	Building transborder research infrastructure to facilitate the R&D of the intended resiliant infrastructure.	High	High	Medium
9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation					SLICES Summer Schools and mobility grants can facilitate fair and accessible entry to SLICES-RI, promoting equity and affordability.	Low	Medium	Low

9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation					Providing research infrastructure to develop and test new technologies to access the information. SLICES will significantly increase access to information and communications technology.	High	Medium	High

10 Reduced Inequalities Reduce inequality within and among countries					Define and implement inclusive human resource policies within the SLICES initiative. Inclusive human resource policies will foster collaboration, innovation, and the exchange of ideas, leading to a more vibrant and inclusive SLICES community.	High	Low	High

11 Sustainable Cities and Communities Make cities inclusive, safe, resilient and sustainable					Use case defined in SLICES-DS for this point: "Reduce number of deaths and those affected by disasters."	Low	Low	Medium
12 Responsible Consumption and Production Ensure sustainable consumption and production patterns	Lack of guidelines about what to do with the hardware at the end of the project.	Medium	Medium	Medium				

12 Responsible Consumption and Production Ensure sustainable consumption and production patterns	The hardware needs to be renewed regularly in SLICES, which can create additional waste. Currently there is no policy yet about how to recycle.	Medium	Medium	Medium				
13 Climate Action Take urgent action to combat climate change and its impacts	There is a lack of awareness of the environmental impact of SLICES. There is an environmental footprint, but neither the dimension or real impact has been evaluated.	Medium	Medium	Medium	Use-case in SLICES-DS on natural disasters such as climate related disasters. It can be implementable in SLICES-RI.	Low	Low	Medium

13 Climate Action Take urgent action to combat climate change and its impacts					By raising awareness on sustainability at the Summer School, SLICES may inspire and empower the next generation of researchers to contribute to a more sustainable future.	High	Low	High

16 Peace, Justice and Strong Institutions Promote just, peaceful and inclusive societies	The convergence of dual-use technology and artificial intelligence poses a significant risk within the realm of SLICES. Presently, there is a lack of comprehensive guidelines addressing the concept of dual-use technology, its utilisation, and the associated limitations.	Medium	Medium	Medium				

17 Partnership for the Goals Revitalise the global partnership for sustainable development finance					SLICES has the potential for collaboration with other developing countries to facilitate the replication and connectivity of its infrastructure. By leveraging webinars as a means of communication and knowledge sharing, SLICES can raise awareness about the utilization of its infrastructure among interested parties	High	Low	High

17 Partnership for the Goals Revitalise the global partnership for sustainable development finance					SLICES offers various avenues, such as the academy, training programs, and Summer Schools, to foster global collaboration. By promoting global collaboration, SLICES enhances the potential for groundbreaking research, innovation, and the development of sustainable solutions to address global challenges.	High	Medium	High

Priority Level	SDG #	Risk	Identified Action	Leader
Medium	4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	The research infrastructure SLICES faces the risk of insufficient resources and an excessive number of users, resulting in limited availability of mobility grants and access to remote utilization.	Mobility Grant Allocation Criteria: Develop clear and objective criteria for mobility grant allocation. Prioritize projects that align with SLICES' strategic goals and demonstrate potential for high-impact research outcomes.	CNR
Medium	4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	There is a possibility that the SLICES academy may not be accessible to users who require it.	Increased communication campaigns to reach broader targets.	MI
Medium	4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Due to limited resources, it is necessary to narrow down the scope of education topics. However, a disadvantage of this approach is that the selection of topics becomes subjective.	Conduct a comprehensive needs assessment to identify the most relevant and pressing education topics based on the requirements and interests of the target audience.	UC3M, UTH

Low	5 Gender Equality Achieve gender equality and empower all women and girls	In SLICES, there is a concern regarding discriminatory hiring practices that prioritize gender over qualifications.	Equal Opportunity Policy: Establish a clear and comprehensive equal opportunity policy that promotes fairness and prohibits any form of discrimination in the hiring process. Ensure that all hiring decisions are based solely on qualifications, skills, experience, and merit. Unbiased Job Descriptions and Criteria: Review and update job descriptions and criteria to ensure they are unbiased and focus on the essential qualifications and competencies required for the positions. Avoid any language or requirements that may inadvertently favor or exclude any particular gender.	UVA, INRIA, SU
Medium	5 Gender Equality Achieve gender equality and empower all women and girls	There is an insufficient representation of women involved in SLICES	Incorporating a dedicated segment on gender equality within the HR deliverable and formulating a comprehensive human resources policy.	UVA, INRIA, SU

Medium	6 Clean Water and Sanitation Ensure access to water and sanitation for all	There is a risk of overconsumption of water for the purpose of cooling data centers.	Implement efficient cooling solutions, such as using hot/cold aisle containment, airflow management, and advanced cooling technologies, to reduce the energy requirements for data center cooling.	INRIA

Medium	6 Clean Water and Sanitation Ensure access to water and sanitation for all	There is a risk for an excessive utilisation of water in the manufacturing process of hardware used in SLICES.	Water Metering: Install water meters at key points in the hardware manufacturing process to accurately measure and monitor water usage. This allows for the identification of high-consumption areas and facilitates targeted water conservation efforts. Real-time Monitoring: Utilize real-time monitoring systems to continuously track water consumption during hardware manufacturing. This enables prompt identification of abnormal usage patterns or inefficiencies, prompting timely interventions for optimization. Water Efficiency Benchmarks: Establish benchmarks for water consumption in hardware manufacturing based on industry standards and best practices. Regularly compare actual water usage against these benchmarks to identify areas where water consumption can be reduced.	INRIA

High	7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	The intensive usage of research infrastructure in SLICES projects may lead to excessive energy consumption.	Deploy smart energy monitoring systems to track and analyse energy consumption patterns in real-time, enabling proactive energy management and identifying areas for optimization.	INRIA
Low	9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	Lack of adoption of the SLICES-RI may be due to technology issues or an inalignment of needs and requirements of end-users.	Advisory Board: The Advisory Board consisting of representatives from the research community, industry, and relevant organizations. The board's expertise and guidance will help steer SLICES-RI development in line with user requirements.	PNSC
Medium	12 Responsible Consumption and Production Ensure sustainable consumption and production patterns	Lack of guidelines about what to do with the hardware at the end of the project.	Develop a comprehensive roadmap for post-project hardware management. This roadmap should outline the steps and procedures to follow once the project concludes, including options for repurposing, recycling, or disposing of the hardware responsibly.	CNR

Medium	12 Responsible Consumption and Production Ensure sustainable consumption and production patterns	The hardware needs to be renewed regularly in SLICES, which can create additional waste. Currently there is no policy yet about how to recycle.	Integrate the recycling guidelines into the project's policies and procedures. Establish protocols for systematically recycling hardware at the end of its lifecycle, including procedures for data wiping and secure disposal of sensitive information.	CNR

Medium	13 Climate Action Take urgent action to combat climate change and its impacts	There is a lack of awareness of the environmental impact of SLICES. There is an environmental footprint, but neither the dimension or real impact has been evaluated.	TRANSFER: Dedicated SLICES Call: Initiate a dedicated call within SLICES (Green DIGIT) to specifically investigate and evaluate the environmental impact of the initiative. This call should encourage researchers, experts, and relevant stakeholders to contribute to the assessment and provide insights into the environmental aspects of SLICES. Environmental Impact Assessment: Conduct a thorough environmental impact assessment of SLICES, considering its entire lifecycle, from infrastructure development to operational phases. This assessment should evaluate the potential environmental risks and impacts associated with SLICES, including energy consumption, waste generation, carbon emissions, water usage, and any other relevant factors."	UVA, IoT Lab, MI, Inria, GREEN DIGIT

Medium	16 Peace, Justice and Strong Institutions Promote just, peaceful and inclusive societies	The convergence of dual-use technology and artificial intelligence poses a significant risk within the realm of SLICES. Presently, there is a lack of comprehensive guidelines addressing the concept of dual-use technology, its utilisation, and the associated limitations.	Implementing an ethical board comprised of both SLICES members and external individuals such as lawyers, journalists, and representatives from the general public, would serve to validate the dual-use/grey zone cases and establish guidelines to mitigate associated risks.	UCLAN

Priority Level	SDG #	Opportunity	Identified Action	Leader

High	4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Ensuring inclusivity of the SLICES academy by making it accessible to all individuals, regardless of their location or background.	Virtual Participation: Organize virtual sessions or webinars as part of the SLICES academy to allow individuals who are unable to physically attend the opportunity to participate remotely. Virtual sessions can include live streaming of presentations, interactive Q&A sessions, and online collaboration tools to engage attendees from different locations. Diverse Speakers and Topics: Curate a diverse range of speakers and topics that reflect the interests and perspectives of a broad audience. Representation of different backgrounds, expertise, and experiences among speakers will create a more inclusive learning environment.	UC3M, UTH

High	4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	The establishment of SLICES Summer Schools with the objective of fostering educational opportunities.	Curriculum Development: Develop a comprehensive and diverse curriculum for SLICES Summer Schools that covers various aspects of future ICT technologies, including networking, computing, cloud technologies, edge computing, and application domains. Ensure that the curriculum aligns with the latest advancements and industry trends to provide participants with cutting-edge knowledge. Engage Expert Instructors: Invite experts and renowned professionals in the field of future ICT technologies to serve as instructors and mentors during the Summer Schools. Their expertise and experience will enrich the learning experience and provide valuable insights to the participants. Target Diverse Participants: Design the Summer Schools to be inclusive and accessible to participants from different backgrounds, including students, researchers, industry professionals, and individuals from underrepresented communities. Encouraging diversity among participants will foster a more dynamic and inclusive learning environment.	CNR, UTH, Eurecom

Medium	4 Quality Education Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Introduce mobility grants as a means of motivating young researchers to actively engage in collaboration with SLICES.	Widening the Scope of Grants: Expand the eligibility criteria and scope of mobility grants to include a broader range of young researchers, such as early-career academics, postdoctoral fellows, and graduate students. This will encourage more young talents to participate in collaborative research initiatives with SLICES. Attractive Grant Packages: Develop competitive grant packages that provide sufficient financial support to cover travel expenses, accommodation, and other associated costs. Offering attractive and comprehensive grant packages will entice young researchers to pursue collaboration opportunities with SLICES. Publicize Success Stories: Share success stories of young researchers who have benefited from mobility grants and actively engaged in fruitful collaborations with SLICES. Publicizing these success stories will inspire others and showcase the positive outcomes of the opportunity.	CNR

High	5 Gender Equality Achieve gender equality and empower all women and girls	Ensuring the representation of women in SLICES-RI by including a section on gender equality in the HR deliverable and creating a human resources policy.	Incorporating a dedicated segment on gender equality within the HR deliverable and formulating a comprehensive human resources policy.	UVA
Medium	5 Gender Equality Achieve gender equality and empower all women and girls	Giving the visibility to women in SLICES-RI (projects and events) by ensuring gender balance (agenda, events).	Actively seeking out and inviting female experts and leaders in the field to participate in conferences, workshops, and other gatherings related to SLICES-RI initiatives. Additionally, creating guidelines for events to ensure gender-balanced agendas and panels could help to prioritize diversity and inclusion in all aspects of project-related activities.	MI, SU
High	5 Gender Equality Achieve gender equality and empower all women and girls	Raising awareness on gender balance in T6.3.	Incorporating a dedicated segment on gender balance within the HR deliverable and monitoring at the consortium level.	INRIA, SU

High	6 Clean Water and Sanitation Ensure access to water and sanitation for all	Raising awareness and overseeing the water usage.	Awareness Campaigns: Develop and implement awareness campaigns to educate staff, researchers, and stakeholders about the importance of water conservation and sustainable practices. Use various communication channels, such as workshops, seminars, posters, and online platforms, to reach a wider audience.	INRIA
High	6 Clean Water and Sanitation Ensure access to water and sanitation for all	Enhancing the research infrastructure to improve energy efficiency, particularly by upgrading the cooling infrastructure.	Water Monitoring Systems: Implement water monitoring systems to track real-time water usage and identify any irregularities or inefficiencies. These systems can provide valuable insights to inform decision-making and optimize water management strategies. Data Collection and Reporting: Establish a data collection and reporting mechanism to regularly track and analyze water consumption trends. This data can be used to set targets, measure progress, and identify areas for further improvement.	INRIA

Medium	7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	Improving the research infrastructure comprehensively in terms of energy efficiency, encompassing aspects such as architectural design, interoperability, and spanning across all domains.	Energy Audit and Assessment: Conduct a thorough energy audit and assessment of the research infrastructure to identify areas of energy inefficiency and potential improvements. This audit will serve as a baseline to measure progress and guide future energy-saving initiatives.	INRIA
High	7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	Create a detailed plan for integrating green networking infrastructure, such as photovoltaic farms, into SLICES, considering individual implementation and addressing potential budgetary constraints.	Initial Assessment: Conduct a comprehensive assessment of SLICES' energy needs and the potential for integrating green networking infrastructure. Identify suitable locations for photovoltaic farms and evaluate their potential energy generation capacity. Feasibility Study: Conduct a feasibility study to determine the technical viability and cost-effectiveness of implementing photovoltaic farms within SLICES. Assess the available space, solar exposure, and grid connection requirements.	INRIA

High	7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	Establish a comprehensive plan for supporting infrastructure that promotes energy savings and efficiency to significantly reduce the energy consumption of SLICES infrastructures.	Energy-Efficient Architectural Design: Integrate energy-efficient architectural design principles into the planning and construction of new research facilities or the renovation of existing ones. Utilize sustainable materials, optimize natural lighting, and implement passive cooling and heating strategies.	INRIA
Low	7 Affordable and Clean Energy Ensure access to affordable, reliable, sustainable and modern energy	Providing transparent information regarding energy measurement, including the power consumption of experiments.	Meters can be included in all projects (if approved by everyone) to measure energy/electricity consumption. This will provide the energy cost of an experiment and can be used in future work. There will be an increased focus on the whole life cycle of the infrastructure we will deploy and use.	INRIA

High	8 Decent Work and Economic Growth Promote inclusive and sustainable economic growth, employment and decent work for all	Suggesting initiatives for capacity building and human resource development policies.	Training and Workshops: Organize regular training sessions and workshops for researchers and staff to enhance their skills and expertise in areas relevant to SLICES' objectives. These can include technical training on advanced ICT technologies, research methodologies, project management, and communication skills. Internship Opportunities: Offer internship opportunities to students and early-career researchers to gain practical experience and exposure to cutting-edge research within SLICES. Internships can serve as a talent pipeline and encourage young talents to pursue careers in relevant domains. Diversity and Inclusion Policies: Implement diversity and inclusion policies that promote equal opportunities for researchers from diverse backgrounds and underrepresented communities. A diverse workforce fosters creativity, innovation, and a broader range of perspectives.	UC3M, CNR, INRIA, SU

Medium	8 Decent Work and Economic Growth Promote inclusive and sustainable economic growth, employment and decent work for all	The SLICES Academy has the potential to enhance the productivity of researchers.	Specialized Training Programs: The Academy can design and offer specialized training programs tailored to the needs of researchers. These programs may cover cutting-edge research methodologies, advanced data analysis techniques, and other relevant skills to enhance their expertise. Interdisciplinary Collaboration: By bringing together researchers from diverse disciplines, the Academy fosters interdisciplinary collaboration. This cross-pollination of ideas and expertise can lead to innovative research projects and novel solutions to complex problems.	UC3M, CNR, SU, Eurecom
Medium	9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	Building transborder research infrastructure to facilitate the R&D of the intended resiliant infrastructure.	Upscaling: expand the SLICES community by encouraging partnerships with research institutions, universities, and organizations from different countries to collectively work on resilient infrastructure R&D projects.	INRIA

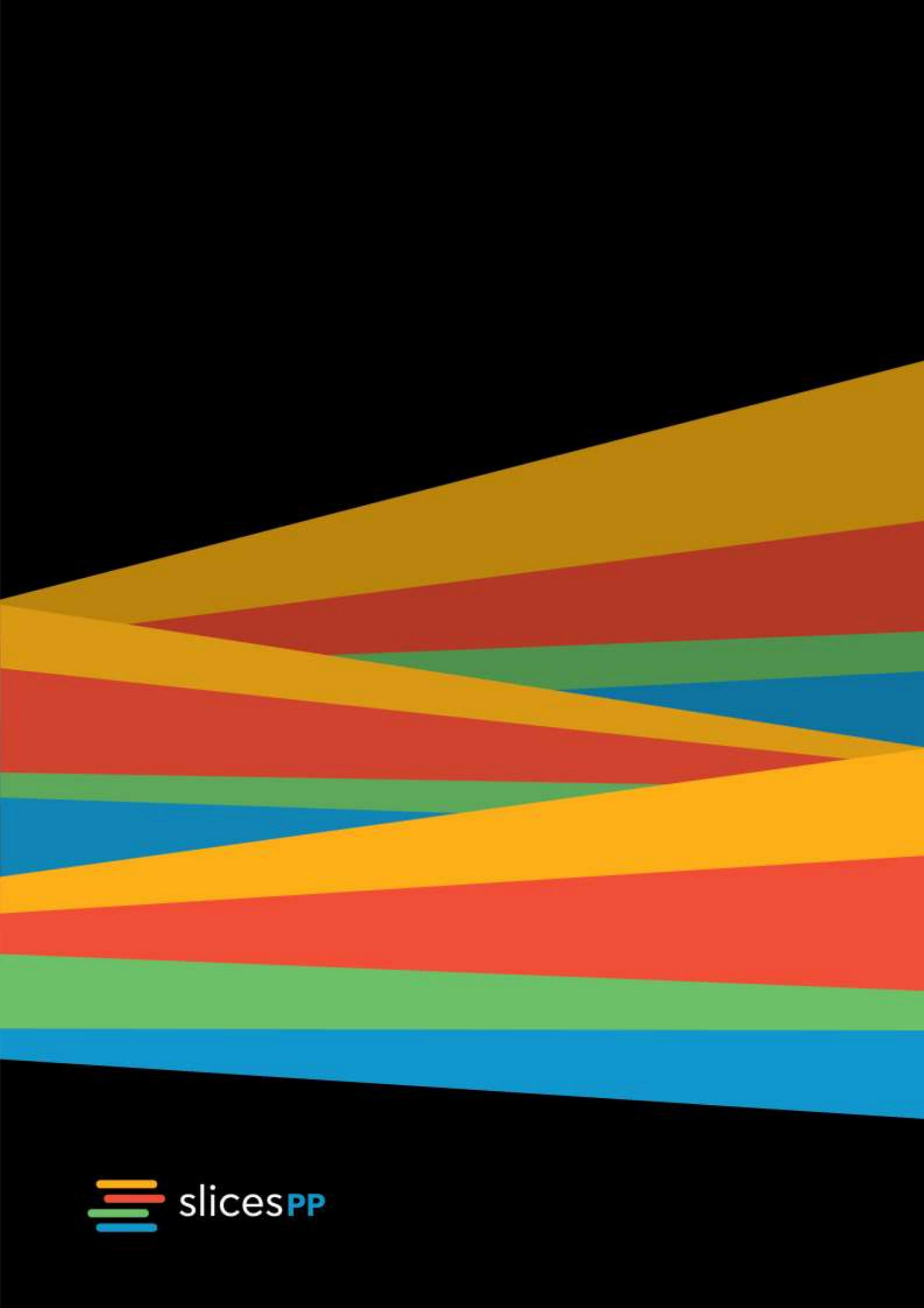
Low	9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	SLICES Summer Schools and mobility grants can facilitate fair and accessible entry to SLICES-RI, promoting equity and affordability.	Expansion of Summer Schools: SLICES-RI will further expand the number and variety of Summer Schools it offers. Online Learning Platforms: Complementing the physical Summer Schools, SLICES-RI will develop online learning platforms that host educational resources, lectures, and workshops. This will enable researchers who are unable to attend in-person events to access valuable knowledge and engage in virtual learning experiences. Long-Term Commitment: SLICES-RI will demonstrate its long-term commitment to equity and affordability by allocating dedicated resources and budget to support these initiatives. This commitment will be reflected in its strategic planning and mission statements	CNR, UTH, UC3M

High	9 Industry Innovation and Infrastructure Build resilient infrastructure, promote sustainable industrialization and foster innovation	Providing research infrastructure to develop and test new technologies to access the information. SLICES will significantly increase access to information and communications technology.	Provide training and capacity-building programs to SLICES staff and researchers to familiarize them with the new infrastructure and technologies. Foster collaboration and partnerships with external organizations, research institutions, and technology providers to leverage additional expertise and resources in ICT infrastructure development.	CNR, IMEC
High	10 Reduced Inequalities Reduce inequality within and among countries	Define and implement inclusive human resource policies within the SLICES initiative. Inclusive human resource policies will foster collaboration, innovation, and the exchange of ideas, leading to a more vibrant and inclusive SLICES community.	Human Resource Policy Review: Conduct a thorough review of the current human resource policies to identify areas that may hinder inclusivity or inadvertently lead to bias. Address any existing disparities and ensure that all policies align with the principles of diversity and inclusion.	SU, UVA

Medium	11 Sustainable Cities and Communities Make cities inclusive, safe, resilient and sustainable	Use case defined in SLICES-DS for this point: “Reduce number of deaths and those affected by disasters.”	Disseminate the use case and its learnings to the general public	MI
Medium	13 Climate Action Take urgent action to combat climate change and its impacts	Use-case in SLICES-DS on natural disasters such as climate related disasters. It can be implementable in SLICES-RI.	Disseminate the use case and its learnings to the general public	MI
High	13 Climate Action Take urgent action to combat climate change and its impacts	Raising awareness on sustainability within the SLICES Academy may empower researchers to develop solutions that address environmental, social, and economic challenges, ensuring a more sustainable future.	Sustainability Seminars and Workshops: Organize regular seminars and workshops focused on sustainability-related topics. Invite experts, practitioners, and thought leaders from diverse fields to share their knowledge, experiences, and success stories in sustainable practices.	UC3M, SU, INRIA, MI, IoT Lab

High	13 Climate Action Take urgent action to combat climate change and its impacts	By raising awareness on sustainability at the Summer School, SLICES may inspire and empower the next generation of researchers to contribute to a more sustainable future.	Sustainability Curriculum Integration: Incorporate sustainability-related content into the SLICES Academy's curriculum. Ensure that courses, research projects, and training materials emphasize the importance of sustainability in energy optimization, provisioning, and life cycle analysis.	CNR, Eurecom, Inria
High	17 Partnership for the Goals Revitalise the global partnership for sustainable development finance	SLICES has the potential for collaboration with other developing countries to facilitate the replication and connectivity of its infrastructure. By leveraging webinars as a means of communication and knowledge sharing, SLICES can raise awareness about the utilization of its infrastructure among interested parties	Summer Schools and Joint Workshops: Collaborate with partner institutions to organize joint Summer Schools and workshops. These events will bring together participants from different countries to explore interdisciplinary research topics and build lasting connections.	SU, UTH, INRIA, UC3M

High	17 Partnership for the Goals Revitalise the global partnership for sustainable development finance	SLICES offers various avenues, such as the academy, training programs, and Summer Schools, to foster global collaboration. By promoting global collaboration, SLICES enhances the potential for groundbreaking research, innovation, and the development of sustainable solutions to address global challenges.	Collaborative Planning: Engage with representatives from developing countries to collaboratively plan and design the content and themes of the webinar series. This ensures that the webinars address specific needs and challenges relevant to these regions.	Eurecom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