

Public Consultation Document:

Towards a Smart Specialisation Strategy

2021-2027 for Malta

1. Introduction

Smart specialisation is a place-based policy approach that foresees channelling of public and private investments in carefully selected priority areas, through an ‘entrepreneurial discovery process’ (EDP).¹

The EDP enables smart specialisation to address the difficult problem of prioritisation and resource allocation decisions by allowing entrepreneurial actors to demonstrate the most promising areas for future regional development (European Commission: Smart Specialisation Platform, 2012). The EDP process can reveal what a country or region does best in terms of R&D and innovation because entrepreneurial actors are best placed to know or discover what they are good at producing.

The EDP promotes a bottom-up approach that allows policy-makers to learn from the stakeholders of the quadruple helix (government, academia, industry and civil society). It concerns the prioritisation of investment based on an inclusive stakeholder engagement and attention to national and international market dynamics and value chains. A national research and innovation strategy for smart specialisation (RIS3) is therefore an economic transformation agenda based on four general principles that are the criteria of the RIS3 process (choices and critical mass, competitive advantage, connectivity and clusters and collaborative leadership).

Smart specialisation is a key principle underpinning the European Commission Cohesion Policy for the period 2021-2027 in the Research, Technology, Development and Innovation (RTDI) priority. Similar to the programming period 2014-2020, having a Smart Specialisation Strategy is an enabling condition for EU Member States (MS) to access structural funding under the European Regional Development Fund (ERDF) in this field.

This consultation paper builds on achievements and lessons learnt in the current RIS3 2014-2020 (The Malta Council for Science and Technology, 2014)². The purpose of the renewed strategy is not to start the process from scratch, but to further reinforce those components that are not yet sufficiently developed, and to use this opportunity to recalibrate Malta’s priorities in line with economic developments as well as national challenges.

¹ Smart Specialisation Platform, Europe Commission
<https://s3platform.jrc.ec.europa.eu/what-is-smart-specialisation->

² National Research & Innovation Strategy, Malta Council for Science and Technology
<https://mcst.gov.mt/psi/national-research-innovation-strategy/>

1.1 Transition between current strategy & new strategy

The current RIS3 is incorporated as one of the three pillars of the National Research and Innovation Strategy 2014-2020 (The Malta Council for Science and Technology, 2014). The rationale behind this decision was to embed smart specialisation within the national context, and also to support the investment in smart specialisation through the other goals of the national Strategy, namely achieving a comprehensive R&I support ecosystem and achieving a stronger knowledge base. Whilst the importance of embedding RIS3 within the national context is still recognised, a decision by the governance structure (Core Group and Steering Group³) was taken in 2019 to have two separate strategy documents that, while remaining synergistic, address different aspects of the research and innovation system in a more holistic manner. By way of a practical example the approach to internationalisation of identified RIS3 areas may well need to be managed very differently to internationalisation of Malta's R&D in general, hence the importance of separate (but complementary) approaches.

The RIS3 2014-2020 process involved a rigorous bottom-up approach and a variety of inputs, which eventually led to the identification of seven (7) smart specialisation areas, and a cross-cutting enabler⁴. Malta also committed to follow up the 2014-2020 Strategy with the development of a dedicated Action Plan and the setting up of a tailored Monitoring Mechanism, and to use the next seven years to refine the process, strengthen the EDP and continue honing in on Malta's competitive strengths. Hence, the RIS3 2021-2027 will build on the previous strategy using the experience gained and will continue streamlining the selection of priority areas based on past success.

The above can be briefly summarised in the below SWOT analysis of the current RIS3 Strategy 2014-2020.

³ Malta Council for Science and Technology. National Research & Innovation Strategy. Retrieved from <https://mcst.gov.mt/psi/national-research-innovation-strategy/#1568293707847-40fd0565-c843>

⁴ RIS3 2014 - 2020 Smart Specialisation Areas are Tourism Product Development, Maritime Services, Aviation & Aerospace, Health with a focus on healthy living and active ageing and e-health, Resource-efficient Buildings, High value-added manufacturing, Aquaculture, and ICT both as an enabler and an innovation area in itself.

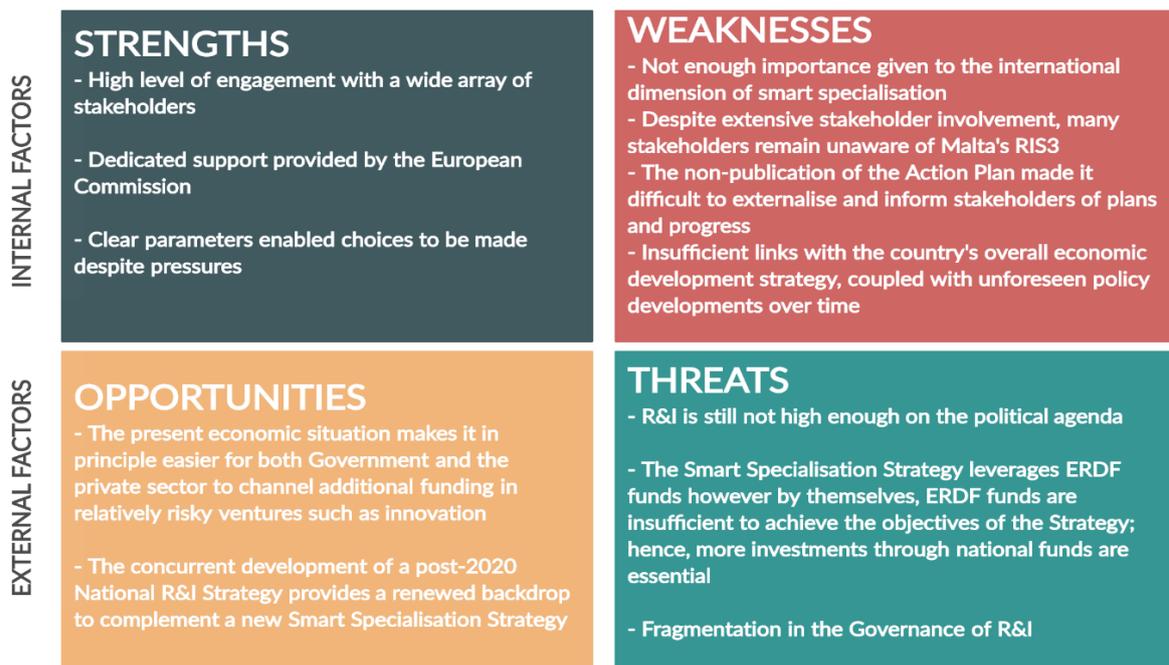


FIGURE 1 SWOT ANALYSIS OF THE CURRENT RIS3 STRATEGY 2014-2020

2. Methodology

According to the most recent document provided by the Joint Research Centre (European Commission: Smart Specialisation Platform, 2012)⁵ as a methodological guidance for policy-makers and implementing bodies on how to prepare for and design, draft and implement national/regional research and innovation strategies for smart specialisation (RIS3), the following practical steps are recommended:

1. the analysis of the national/regional context and potential for innovation,
2. the set-up of a sound and inclusive governance structure,
3. the production of a shared vision about the future of the country/region,
4. the selection of a limited number of priorities for national/regional development,
5. the establishment of suitable policy mixes, and
6. the integration of monitoring and evaluation mechanisms.

Based on the above, the approach adopted by MCST involved an in-depth desk-based analysis of available relevant statistics and trends, a questionnaire addressed to civil society in general, dedicated interviews and sessions with public and private stakeholders as well as thematic focus groups. Over 150 meetings were held between November 2018 and February 2020 as part of this process, in order to ensure that all actors of the quadruple helix were

⁵ European Commission (2012). Guide to Research and Innovation Strategies for Smart Specialisations. Retrieved from: <https://s3platform.jrc.ec.europa.eu/documents/20182/84453/RIS3+Guide.pdf/fceb8c58-73a9-4863-8107-752aef77e7b4>

adequately involved in the bottom-up strategy process. The timeline is explained in detail in Figure 2.

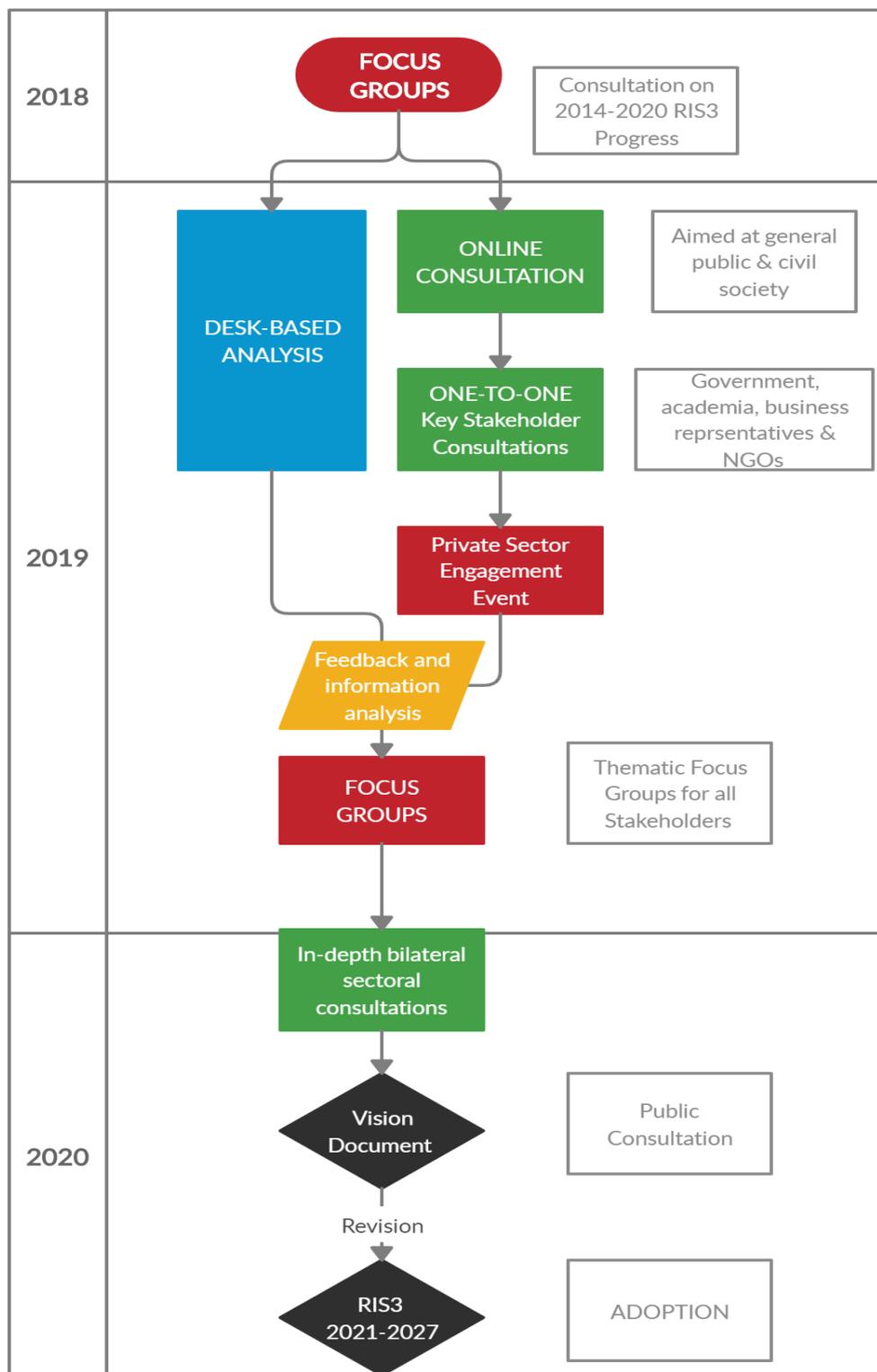


FIGURE 2 - METHODOLOGY AND TIMELINE OF THE RIS3 2021-2027 PROCESS

3. Priority Areas

Malta has provisionally identified five (5) potential smart specialisation areas for the period 2021-2027. These are:

- Health and Well-being,
- Sustainable Use of Resources for Climate Change Mitigation,
- Smart Manufacturing,
- Marine & Maritime Technology,
- Future Digital Technology (this is both a vertical priority and a horizontal enabler for the former four areas).

The above is better illustrated in Figure 3. The information presented in the following areas has been obtained through the desk-based analysis as well as feedback obtained through the extensive stakeholder consultation process.



FIGURE 3 PROPOSED RIS3 AREAS 2021-2027

3.1 Smart Manufacturing

Manufacturing is a traditional economic sector in Malta. The gross value-added for Manufacturing (NACE Code C) has been steadily increasing over the last few years (from €722.3 million in 2015 to €910.1 million in 2018). Investments have remained stable and the number of enterprises in this NACE code is steadily increasing over time. Hence, it remains a relevant sector that generates a significant income for the island (9% share of GVA in 2018) and accounts for 13% of all private sector employment.⁶ The desk-based analysis carried out indicates that various investments have been made to continue supporting this sector. Indeed, High Value-Added Manufacturing (HVAM) was identified as a smart specialisation

⁶ Grima MC, (Accessed on 25.2.2020). Why Manufacturing Still Matters. Retrieved from: <https://www.maltachamber.org.mt/en/why-manufacturing-in-malta-still-matters>.

area in the RIS3 2014-2020. 27% of all projects awarded through the National R&I Programme (FUSION⁷) between 2015 and 2019 (latest data available) were in this area.

Based on stakeholder discussions, the local economy does not support the development of HVAM for home-grown companies because the main income of many local companies is through subcontracted work from FDIs. Many local companies are thus unable to focus on their own innovative product lines. In addition, stakeholders expressed the view that the support framework in place, at present, does not adequately support local manufacturers to move up the value chain. For example, applications for funding schemes are too time consuming and often companies cannot afford the co-financing. Also, legal and tax incentives in place are largely aimed towards FDIs.

As part of the EDP, stakeholders identified the need to incentivise the manufacturing industry to focus on high value-added products which come about as a result of innovation-driven digitisation. Hence, Malta should support the sector to move towards Industry 4.0⁸ and invest in “smart manufacturing” through dedicated incentives that assist the private sector. Specifically, support should be available for the following niche areas:

a) Sustainable Manufacturing

Since Malta is an island, manufacturing enterprises are at a disadvantage due to added production costs (material is imported, additional export charges etc.). In order to remain competitive, companies need to find innovative ways to reduce other costs, such as energy costs, to offset these disadvantages and improve efficiency. Innovative investments can be made to support companies to transition towards more sustainable materials and processes without increasing costs.

b) Flexible Automation

Stakeholders feel that today’s global economic landscape necessitates that manufacturing moves away from mass production and assembly lines, and instead focus on flexibility and customisation via flexible automation. This would require manufacturing smaller quantities of a wider variety/range of products. Stock quantities and relative storage space requirements would decrease, thus increasing cost efficiency while diversifying the customer base.

3D printing is an aid when it comes to flexible automation and could eventually replace traditional methods such as injection moulding. 3D printing is also considered an enabling technology for sampling or prototyping products or components. Investments in robotics could assist companies to automate production lines and help alleviate pressures of human resource availability. Consulted stakeholders feel that an array of support schemes is needed to help companies in this transition and hence, embrace Industry 4.0.

⁷ FUSION programme <https://mcst.gov.mt/ri-programmes/fusion/>

⁸ Industry 4.0 definition <https://www.i-scoop.eu/industry-4-0/>

3.2 Sustainable use of Resources for Climate Change Mitigation

Malta is the most densely populated country in the EU and remains particularly vulnerable to climate risks (European Commission, 2020). The importance of innovation in this area stems from the need for tailor-made solutions to enable Malta to fulfil the legal obligations that it has in this field as well as its commitment to fulfilling international agreements such as the European Green Deal, Paris Agreement and UN's Sustainable Development Goals.

Under the EU's current research framework programme for 2014-2020, 46 applications were submitted by Maltese individuals and organisations for projects under the 'Climate action, environment, resource efficiency and raw materials' category, with over €10 million requested for funding. Furthermore, in 2016, 3,481 jobs were related to the green economy, making up nearly 2% of the total employment in the Maltese economy, with the strongest area being within the water supply, sewerage, waste management and remediation activities field (57%)⁹. The 2014-2020 RIS3 Strategy identified resource-efficient buildings as a smart specialisation area. This led to the development of a 'Sustainable Living Complex' within the UM to serve as a living lab to test new building methodologies and materials in a real-life scenario.

The present and future challenges associated with the sector will require Malta to build on the country's existing capacity and investments to further improve its design and management of resource and energy-efficient systems. It is therefore recommended that Malta looks to further strengthen its R&I expertise in innovative solutions for waste, water and energy. The following niche areas are proposed for further investments:

a) Towards Zero Carbon Buildings

This area addresses water, energy, building materials and recycling of construction and demolition waste. GVA in the construction sector (NACE F) overall increased by 128.5 million EUR since 2010 (contributing to almost 4% of GVA in 2018) while employment increased by 2.9 thousand since 2010 (6.35% of total employment in 2018). This growth is generating increasing social and environmental concerns relating to, inter alia, land use, waste management (construction and demolition waste rose to over 2.2 million tonnes in 2017, up from 1.3 million tonnes in 2016¹⁰) as well as an increase in the energy consumption of buildings. Legal Notice 376/2012¹¹ requires that by 31st December 2020 all new buildings are nearly zero-energy buildings. New buildings occupied and owned by public authorities were required to be nearly zero-energy buildings by 31st December 2018. Therefore, building quality needs to improve to ensure that architecture and civil engineering contribute towards buildings that are more energy efficient. This should also be complemented by investments in energy efficient technological solutions for new and existing buildings (retrofitting).¹²

The feedback received through the consultation process points to a need for more investment in tailor-made solutions for Malta. Several academics at the University of Malta (UM) and the Malta College of Arts, Science and Technology (MCAST) are carrying out research in the area of energy and water efficiency in buildings as well as construction and

⁹ State of the Environment Report 2018, Environment and Resources Authority

¹⁰ *Country Report Malta 2020 2020 European Semester: Assessment of progress on structural reforms, prevention and correction of macroeconomic imbalances, and results of in-depth reviews under Regulation (EU) No 1176/2011*

¹¹ Legal Notice 376/2012 Energy Performance of Building Regulations
<http://www.justiceservices.gov.mt/DownloadDocument.aspx?app=lom&itemid=11947&l=1>

¹² *Malta's Low Carbon Development Strategy Our Vision May 2017*

demolition waste recycling. The Sustainable Living Complex project within the UM will provide a space for collaboration between the academic and private sector on developing innovative solutions to Malta's challenges in this area. Other ongoing projects include improving environmental performance of heritage buildings, green roofs suitable for the Mediterranean climate, material lifecycles and lightweight composites. Private entities are working on building materials with improved insulation properties and sustainable technologies such as smart lighting and sustainable heating/cooling systems.

b) Renewable Energy Generation and Energy Storage Solutions

Malta's dense population and limited land area render offshore and marine renewable energy technologies a potentially important alternative for Malta to invest in renewables. Malta has several successful projects in this area, such as FLASC (hydro-energy storage system for offshore multi-purpose floating platforms) and there is a need to test/upscale existing solutions in order to further develop and commercialise alternative renewable energy technologies.

c) Resource Efficiency in Industry

Investment in this sector is essential to strengthen competitiveness and commercial attractiveness. Processes can be analysed with the aim of minimising resource consumption, without affecting quality. There is an opportunity for industry to tap structural funds to develop innovative resource efficient solutions. This area also ties in with the identified need for support towards sustainable manufacturing (Section 3.1)

d) Turning Waste into a Resource

While the shift from a linear to a circular economy¹³ is indeed a global one, the challenges that different countries face and the solutions required may well be very diverse. Malta's insularity and lack of economies of scale are perhaps the greatest obstacles to reach the defined targets. Malta's Waste Management Plan recognizes a number of targets that Malta is expected to reach which include recycling 50 % of paper, plastics, metal and glass waste from households by 2020; recovering 70 % of construction and demolition waste by 2020; and a binding landfill target to reduce landfill to maximum of 10 % of all waste by 2030.

In 2015, based on statistics released by NSO in 2017, 2,652 tonnes of dry recyclables were collected through bring-in sites whilst a further 14,926 tonnes were collected through the kerbside collection system. Taken together, this accounts for a separation rate of around 17% which is below the recycling targets. Circa 190,000 tonnes of biodegradable municipal waste generated were landfilled in 2015. The latter exceeds the amount of biodegradable municipal waste generated that is allowed to landfill, which stands at circa 50,000 tonnes. It is acknowledged that these threats are compounded by Malta's limited land mass and small population (thus a limited market) where diseconomies of scale determine the

¹³ European Commission (Accessed on 12.3.2020). A circular economy aims to maintain the value of products, materials and resources for as long as possible by returning them into the product cycle at the end of their use, while minimising the generation of waste. Retrieved from: <https://ec.europa.eu/eurostat/web/circular-economy>;

feasibility of nearly all commercially driven operations¹⁴. Therefore, tailor-made solutions for Malta need be developed.

3.3 Marine and Maritime Technology

Malta's marine sector is a very important economic contributor, with 15.4% of Malta's total GDP dependent on the marine environment, and offering opportunities in an array of areas¹⁵. There is, perhaps unsurprisingly, strong evidence of interest by the local researcher community in marine research. 14.78% of the University of Malta's publications on the priority areas identified in the current smart specialisation areas stemmed from the Maritime and Aquaculture sectors. Furthermore, from 2016 to 2018, 39 research projects relevant to the Marine sectors were carried out by students at MCAST. This interest is further backed up by the data relating to the participation of Maltese researchers in the EU's Horizon 2020 framework programme in relevant fields. Based on data published on eCORDA, 15 participants received funding in the area of food security, sustainable agriculture and forestry, marine & maritime water research, and the bioeconomy. From these 15 participants, 8 were from the private sector specifically under "marine and maritime" projects. Therefore, the following niche areas are being proposed for further investment:

a) Marine Biotechnology

The aquaculture industry has considerable socioeconomic value and potential, notwithstanding challenges such as competing uses like tourism and shipping, and the environmental impact of aquaculture activities. This sector contributes to primary food production, provides valuable export earnings and contributes positively towards the EU trade deficit for fisheries products¹⁶. The Malta Aquaculture Research Centre (MARC) has conducted a variety of national and EU-funded projects on species diversification, the hatching of amberjack and blue-fin tuna, in partnership with local fish-farming companies. Malta should therefore look to build on this R&I capacity and explore how best to exploit their research results on different finfish species, shellfish and aquatic plants, as well as the non-fish farming side of aquaculture. Moreover, the aquaculture sector is looking into turning fish waste into a resource and producing new commercial products. Apart from the innovation potential in this biotechnology field, this will lead to a reduction in the volume of fish waste being dumped at sea or not being reused and a greater implementation of circular economy protocols.

b) Maritime Technologies

Malta's maritime sector is mature, has a historic legacy and a world-level profile. The sector has diversified over time and has amassed a strong academic base, with around 2500 publications in the maritime and aquaculture sectors between 2014 and 2018. Moreover,

¹⁴ Waste Management Plan for the Maltese Islands, A Resource Management Approach 2014 - 2020 (MSDEC)

¹⁵ Marine Strategy Framework Directive - Economic and Social Impact Assessment Report, AEE Consortium, 2011

¹⁶ Aquaculture Strategy for the Maltese Islands. Towards Sustainability 2014-2025
<http://www.p2m.com.mt/wp-content/uploads/2015/10/Aquaculture-Strategy-for-Maltese-Islands-July-2014-FINAL.pdf>

the University of Malta is currently investing in a tow tank facility, the first of its kind in Malta. Initial investment has been secured through a Horizon 2020 project aimed solely at the facilitating the network and knowledge exchange in the design of tow testing facilities, and hence, targets training of technical and academic personnel. It however does not fund any equipment or infrastructure, and therefore further structural investment is needed.

Current maritime hull and propulsion design within the local industry is mostly desktop based and validation and verification of virtual models still require a strong element of scaled tow testing which is sought out from testing facilities abroad. Such a facility would open doors to several R&I opportunities and will address the needs of various stakeholders in the maritime sector: maritime engineering operators designing new energy efficient vessels and offshore structures, offshore mooring industry, berthing sector, etc.

Furthermore, the maritime services sector could benefit from modernisation, leading to more cost-effective solutions using digital technology, since stakeholders have mentioned that the maritime sector in general is rather fragmented and paper based. There is also potential in Space applications in this sector, especially in maritime coastal management and marine transport.

3.4 Health and Wellbeing

The health sector continues to be an area of strong R&I potential for Malta. Malta has several advantages to be a strong hub for innovation in health. It has a sizeable population and a centralised public health sector. The native population is largely captured by the health system, enabling Malta to perform longitudinal long-term trials. The Government is the largest stakeholder, especially in terms of healthcare workforce and services, but both academia and private entities have a solid history of successful collaboration through R&I. This is testified by having, until 2019, 29.5% of all projects funded under MCST's FUSION Programme falling under the 'Health' area.

Through a series of stakeholder consultations, the niche areas that emerged as having a strong potential for research and innovation in Malta were: Cancer, Cellular Therapy, Drug Development, e-Health and Biomedical Engineering. These are discussed briefly below.

a. Cancer

The National Cancer Plan (2017-2021)¹⁷ states that every 5 hours, someone in Malta is informed to have cancer. A total of 1800 individuals are diagnosed with cancer each year, with this number expected to increase by around 1.5-2% each year¹⁸. Cancer survival rates for most cancer types has improved over time all across Europe, including Malta; however, a downward trend is observed for the 5-year survival for cancers of the rectum, kidney and non-Hodgkin's lymphoma in Malta.

Cancer research in Malta has gained increased prominence over the past years, as evidenced by the sizeable research cohort within UM, the setting up of the Emanuele Cancer Research

¹⁷ Office of the Deputy Prime Minister and Ministry for Health (Accessed on 12th March 2020). The National Cancer Plan for the Maltese Islands 2017-2021. Retrieved from: <https://deputyprimeminister.gov.mt/en/CMO/Documents/NationalCancerPlan2017.pdf>.

¹⁸ Coleman, M.P., Alexe, D.-M., Albrecht, T. and McKee, M. (2008) Responding to the challenge of cancer in Europe. Ljubljana: Institute of Public Health of the Republic of Slovenia.

Foundation¹⁹ and the inclusion of a dedicated pillar on research and cancer surveillance in the National Cancer Plan.

As a result, a patient-oriented approach to cancer research and innovation is being recommended. Research should focus on emerging or ‘underserved’ areas related to cancer care and control where Malta can make a difference. Investments should promote early diagnosis and screening programmes and the related infrastructure, especially in cancers which have increasing prevalence in Malta. Innovative solutions addressing planning and management of cancer services could result from research using the National Cancer Registry. There is a recognised need to strengthen the Registry’s source base and to further develop its functions and capabilities for it to be better equipped to advance medical knowledge on cancer at the national and international level. Moreover, there is scope for the setting up of a dedicated cluster on cancer research, in order to bring together in a more formal manner all the various research nodes in this area for closer, more holistic collaboration.

b. Cellular Therapy

Cell therapy is a technology that relies on replacing diseased or dysfunctional cells with healthy, functional ones²⁰. According to key stakeholders working in this field, therapeutic products being targeted have important applications in a range of areas including replacement of chronically damaged tissues e.g. bone in revision hip replacement and corneas, as well as islet cell transplantation in diabetes patients. This is important as diabetes is very common in the Maltese population (according to the International Diabetes Federation, there are 40,500 cases of adult diabetes in Malta - 12.2%²¹).

Development of cell therapy leads to the development of niche products and treatment that can target not only the local population, but even a wider base with a significant potential for internationalisation, especially the North African countries. To take on this challenge and take advantage of these opportunities, Malta is investing in strengthening its current infrastructure and human capital in this area through the setting up of a Blood, Tissue and Cell Centre that will service Mater Dei Hospital. However, there is scope to add another important dimension by providing a set up for Malta to be able to carry out adequate training, research, innovation and clinical trials relating to therapeutic products, novel therapies, treatment and management of patients, training of doctorate and post doctorate individuals, attraction of highly specialised industry, employability of highly qualified people in the field, and health tourism with its own knock-off effects.

The current proposed Centre will already be providing novel products to patients in Malta that are currently unavailable (including stem cells, bone, heart valves, for example). There is scope for supporting investments in the construction of dedicated areas and the related equipment necessary to conduct research.

¹⁹ The University of Malta Research, Innovation and Development Trust (Accessed on 12th March 2020). Malta gets its first cancer research foundation. Retrieved from : <https://researchtrustmalta.eu/news/malta-gets-its-first-cancer-research-foundation/>,

²⁰ Science Direct. Cell Therapy. Retrieved from: <https://www.sciencedirect.com/topics/medicine-and-dentistry/cell-therapy>

²¹ International Diabetes Federation. Members. Retrieved from: <https://idf.org/our-network/regions-members/europe/members/149-malta.html>

c. Drug Development

Malta is one of the few countries in Europe which has legalised the production of cannabis for medicinal and research purposes, and therefore there is opportunity for Malta to be the European leader in this field. The business community has reacted to Malta's developments in this regard, and some business activity is already taking place on the ground.

In consideration of the legal restrictions imposed over the years, cannabis for medicinal and research purposes has been essentially unexplored, both locally and beyond. The presently evolving national policy, backed by an enabling legal framework, has created a fitting scenario to attract industry and drive excellence in this field. Such momentum requires corresponding investment to ensure that stakeholders can meet local and international obligations while contributing to make effective research on medicinal cannabis a working reality.

In order to capitalise on this development and strengthen Malta's research position in this field, there is scope for the setting up of an independent, purpose-built facility offering an advanced research environment and analytical services.

d. e-Health

The health care system in Malta is increasingly requiring a suitable IT infrastructure for it to operate adequately and meet today's patients' needs. The establishment of a suitable e-Health infrastructure in Malta is seen as an urgent need. Innovative applications of e-Health that were identified by stakeholders that have increased potential in Malta include Remote Patient Monitoring Systems as well as applications of Artificial Intelligence (e.g. Machine Learning) and Bioinformatics for mature health sectors such as Pathology and Radiology. Bioinformatics would also assist in the analysis of complex biological data generated through health research. Advancing technology in these areas would help assist patients to keep their independence within the community as well as improving diagnostic tools, hence early diagnosis and better health outcomes. Moreover, transforming the entire workflow to a digital platform would significantly improve efficiency.

e. Biomedical Engineering

Biomedical engineering is a niche area which has a track record of innovative solutions for the local and international market, mainly driven by the private sector, especially with respect to Medical Devices. There are also successful projects through close collaborations between academia (medical and engineers) and private companies, some projects addressing Tissue and Neural engineering (e.g. BioSA²² and Wildeye²³ respectively).

²² Tonna, C., Saliba, L. (2019). Iron and its alloys for Bone Regeneration Scaffolds - A Review, *Xjenza Online*, 7(1), 49-64 [online]. Retrieved from: https://www.researchgate.net/profile/Xjenza_Online/publication/336150189_Xjenza_Online_Vol_7_Issue_1/links/5d933233a6fdcc2554a9aea4/Xjenza-Online-Vol-7-Issue-1.pdf#page=56 (Accessed: 13.03.2020)

²³ Cristina, S., Camilleri, K.P. (2018). 'Unobtrusive and pervasive video-based eye-gaze tracking', *Image and Vision computing*, 74, 21-40 [online]. Retrieved from: <https://www.sciencedirect.com/science/article/abs/pii/S026288561830060X?via%3Dihub> (Accessed: 13.03.2020)

Therefore, further support should be provided to continue supporting this area of innovation.

Having private entities willing to collaborate in projects in this sector is a positive sign. Performing R&I in the private sector is very resource intensive and is mostly seen as financially draining, since it takes a lot of trial and error till an innovative product is obtained. Hence, providing suitable funding mechanisms to this niche area could incentivise and help support companies willing to perform R&I.

3.5 Future Digital Technology

In contrast with the above four areas, the digital sector is proposed as both a pillar in and of itself as well as a horizontal enabler of other areas since it interfaces and supports innovation in all thematic areas. The digital sector is particularly fast paced, with innovative solutions quickly becoming obsolete. It is therefore, very difficult to forecast future long-term development scenarios in this particular sector

The 2019 PREDICT Key Facts Report provides a snapshot of the ICT sector (particularly in terms of R&D), within the EU and beyond. The report states that in 2016 the EU ICT sector represented 4.0% of the EU value added, 2.6% of total employment, 15.6% of total business expenditure on R&D and, and 18.2% and 20.4% of the R&D personnel and researchers in the EU, respectively. The ICT producing sector is one of the most dynamic sectors in the economy, standing out for its high R&D intensity and for a productivity that is higher than that of the whole economy. The more dynamic behaviour of the ICT sector in the EU is mostly due to the ICT services sector. In 2016, the EU countries presenting the largest ICT sectors in relative size (ICT sector VA / GDP) were Ireland, Malta, Sweden, Finland, Hungary and Romania, all above 5.0%. Regarding employment, the EU countries presenting the largest values in relative terms were Malta, Estonia, Hungary, Ireland, Finland and Luxembourg, with a share over total employment higher than 3.6%.²⁴

The Maltese Government has taken several initiatives to support this sector, such as the creation of the Malta Digital Innovation Authority (2018), active participation in several large ICT events held in Malta, such as the Delta Summit and the Sigma Summit, and the creation of the Gozo Innovation Hub (2019). Malta is also striving to be the lead in niche areas like Blockchain and Artificial Intelligence (AI). Nevertheless, discussions with stakeholders indicate that the current landscape is fragmented. The private sector struggles to find expertise in this area, and HR is a precious resource. Hence, investments in the coming years will be key to really cement Malta's foothold in this area. Therefore, it is recommended that Malta supports the following areas:

a) Investments in Digital Technology

There are several relatively new and future areas in the field that have the potential to be further developed and exploited. The potential for Malta arises from the fact that the development of digital technologies does not necessarily require substantial capital investments. In addition, Malta and Gozo can be a test bed for digital applications. The

²⁴ Mas, M., Fernández De Guevara, J., Robledo, J.C., Righi, R., Cardona, M., Samoili, S., López Cobo, M. and De Prato, G., The 2019 PREDICT Key Facts Report. An Analysis of ICT R&D in the EU and Beyond, EUR 29770 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-08301-6, doi:10.2760/06479, JRC116987.

niche areas being proposed are artificial intelligence, internet of things²⁵, and distributed ledger technologies (blockchain). Nevertheless, support for innovation should be provided for future emerging technologies and those that are still at an experimental stage at present.

b) Applications in Digital Technologies supporting RIS3

The innovation potential of digital technologies applied to other sectors is vast, and investment requirements might be different. Some areas would require infrastructural investment in hardware and computation power, whilst other areas still need to become digitised before the data can be used for R&I. Consultations with stakeholders point towards prioritising the following:

Potential infrastructural Investments:

- *Big Data and Data Analytics:* It is widely known that the widespread use of the digital technologies and applications is generating vast quantities of data across all sectors. There is huge potential to use this data to analyse patterns, trends and future products. The potential applications in this regard are numerous should the right computation power be available. Hence, there is scope for directing ERDF funds to invest in the hardware needed.
- *Smart Space Applications (for example in Marine and Coastal Applications):* Malta identified the potential of using space data to develop smart applications in the National Space Policy 2017²⁶. Malta's participation in EU space initiatives such as the Copernicus²⁷ and the Galileo²⁸, provides access to digital satellite imagery and satellite positioning which can be used to produce smart applications. Processing such data also requires a good digital infrastructure, and hence there is scope for ERDF support to this end. In addition, it is worth remembering that some global trends suggest that AI and other digital technologies can and will play a role in Space.

Digitising Data:

- *Maritime Sector:* Malta has one of the largest ship registers in the world.^{29 30} The large amount of data in this register has the potential to be digitally exploited in order to provide additional and better, efficient and value-added services.

²⁵ Parliamentary Secretary for Financial Services, Digital Economy and Innovation (2019). Malta The Ultimate Launchpad. Retrieved from: https://malta.ai/wp-content/uploads/2019/11/Malta_The_Ultimate_AI_Launchpad_vFinal.pdf

²⁶ Malta Council for Science and Technology (2017). Malta National Space Policy. Retrieved from: <http://mcst.gov.mt/wp-content/uploads/2017/04/The-Malta-National-Space-Policy-2017.pdf>

²⁷ Copernicus <https://www.copernicus.eu/en>

²⁸ European Commission. Internal Market, Industry, Entrepreneurship and SMEs/ Galileo. https://ec.europa.eu/growth/sectors/space/galileo_en

²⁹ Transport Malta. Maritime. <https://www.transport.gov.mt/ship-registration>

³⁰ Malta Profile. European Leaders Sees Record Growth. Retrieved from: <https://maltaprofile.info/article/maritime-shipping-2017>

- *Human-Centric Applications (Digital Health, Patient Data, etc.):* Please refer to Section 3.4. Digitising the health sector will benefit various areas and is necessary to support innovation in e-health. Digitising patient records could open new opportunities for research, apart from improving patient management and streamlining of hospital logistics. A digital health industry can develop smarter applications and move towards personalised medicine.
- *Digitising Industries (Industry 4.0):* As already described in Section 3.1, companies in Malta need specific incentives to assist them in upgrading operations of manufacturing systems and products through digitisation. The manufacturing sector requires more support to move away from traditional practices towards automation and flexible customisation.

4. Recommended interventions

In their own different ways, the various proposed RIS3 sectors would benefit from ERDF support as described above if such support is directed towards the following intervention areas:

a) *Investment in Research Infrastructure*

The public sector and higher education institutions require support to invest in research infrastructure that would service industry needs. This can be observed in the digital technology sector, health services and marine and maritime technology.

b) *Investment in Internationalisation Initiatives*

To ensure Malta's competitiveness, researchers and the private industry need support to internationalise. To do this, the local research community needs to build its networks through collaborations. This can be done by investing in the next European research framework programme's (Horizon Europe) partnerships. For Maltese researchers to participate and access European funding, Malta has to provide financial contributions that can be supported through structural funds. Selection of partnerships to be funded through ERDF should be in line with Malta's RIS3 areas.

c) *Supporting excellence in R&I through the Seal of Excellence*

The 'Seal of Excellence' is a quality label awarded to project proposals submitted for funding under the EU's Framework Programme for R&I. It is given to those projects which succeeded in passing all the stringent selection and award criteria of the evaluation but could not be funded under the available Call budget. A holder of the certificate can then approach alternative funding sources and present the certificate as a proof of a high-quality project proposal. ERDF could be one such alternative funding source. Projects funded through ERDF should of course be in line with Malta's RIS3 areas.

d) *Incentives for Industry*

Stakeholder consultations indicate that access to finance for R&I remains a struggle for the private sector. Hence, ERDF should continue supporting industry to carry out innovative R&I projects in the RIS3 areas while striving to reduce administrative burdens on applicant companies. In addition, the manufacturing sector requires support to transition towards Industry 4.0, and the majority of the private sector needs assistance to become more resource efficient and embrace the circular economy. Specific funding schemes should be targeted towards these goals.

5. Way Forward

This “Towards” document provides an outline of the potential RIS3 areas for 2021-2027 and is being put forward for public consultation to confirm, or otherwise, whether the outcomes of the EDP truly reflect the R&I potential and the economic strengths of Malta, ensuring that investments are made to support Malta’s competitiveness in the coming seven years. This consultation might also reveal gaps in the analysis carried out, and hence, the final RIS3 Strategy could indeed look very different.

Stakeholder feedback is welcomed until Thursday 9th April 2020 on the email address strategy.mcst@gov.mt.

Following receipt of feedback and its review, MCST will work towards a final Strategy document which will take into consideration the feedback received, and which will give a full picture of the analysis undertaken, the final RIS3 areas and proposed interventions.