marinerg-i

Marine Renewable Energy Infrastructure

Date: 20/12/2019

Report number: D8.2

Report on Business Model

Author(s): University of Strathclyde

Public

This project has received funding from the European Union's H2020 Programme for research, technological development and demonstration under grant agreement No. 739550

Disclaimer

Document Information

Version	Date	Description			
		Responsible	Authors	Reviewed by	Approved by
1.1	12/3/2019	University of Strathclyde	Cameron Johnstone Stephanie Ordonez Rodrigo Martinez	Fiona Devoy McAuliffe	Fiona Devoy McAuliffe

Authors (alphabetical)	
Name	Organisation
Cameron Johnstone	University of Strathclyde
Stephanie Ordonez	University of Strathclyde
Rodrigo Martinez	University of Strathclyde

Acknowledgements/contributions (alphabetical)	
Name	Organisation
Frances Judge	UCC MaREI

Marta Silva	WAVEC

Abbreviations

D	Deliverable
ESFRI	European Strategy Form on Research Infrastructures
ERIC	Energy Research Infrastructures Consortium
ORE	Offshore Renewable Energy
R&D	Research and Development
RI	Research Infrastructure
CEO	Chief Executive Officer
CMO	Central Management Office
STQEAC	Scientific, Technical, Quality and Ethical Advisory Committee
SWOT	Strengths, Weaknesses, Opportunities and Threats
AM	Assembly of Members

Table of Contents

1. Introduction

Emerging Offshore Renewable Energy (ORE) technologies that capture power from waves, tidal streams and offshore wind are showing great potential to become mainstream global energy supply systems in geographical locations with coastal and ocean exposure. To fully realise this potential, research is required on technology development and optimisation, specifically in- systems supporting technology installation and maintenance; improvement in balance of power plant efficiencies together with the production of standardisation methods to enable quantification of performance assessment and bench marking.

At the current time, Europe is regarded as the sector lead with a significant amount of the research and development work and early stage commercial deployment being undertaken. This is being complemented with the development of supporting infrastructures and personnel capacity to meet the demand for new expertise and up-skilling. In order to galvanise investment and technology developments, whilst supporting the evolution and delivery of a global ORE sector, a MARINERG-i ESFRI Project is necessary to facilitate the timely delivery of a sustainable ORE sector.

As outlined in the MARINERG-i Value Proposition (Deliverable (D) 7.8) most of the research infrastructure needed to undertake the scientific studies to address the research agendas identified already exists as a result of significant investment by member states. However, working individually, Member States do not have the capability to support the scientific work that needs to be undertaken to address the Strategic Research Agendas identified for the EU. Evidence of the benefits of a coordinated and integrated approach were provided by the FP7 funded MaRINET and subsequent H2020 funded MaRINET2 projects. Whilst MaRINET and MaRINET2 have very successfully delivered joint research to improve the quality of testing outcomes, a functional network, and a high demand access programme, a step change of considerable magnitude is now required in order to ensure delivery of the identified research agendas on a long-term sustainable basis.

MARINERG-i will establish a modern, efficient, high quality, state-of-the-art ecosystem comprising a cross section of members and stakeholders pre-eminently equipped to undertake cutting-edge research. The MARINERG-i network will include research infrastructures (RI's) where ocean and offshore wind energy technologies can be tested with varying levels of complexity across the full range of TRLs (1-8). MARINERG-i members will be united to form a partnership of testing facilities with clear common foundational objectives and a highly evolved cooperation model.

The value and integrity of the MARINERG-i proposition have already been recognised in the context of the European Strategy Forum on Research Infrastructures (ESFRI), as an emerging project on the ESFRI roadmap. There is now meaningful consensus among participating member states (MS) and their respective facilities, that MARINERG-i is necessary to facilitate the timely delivery of a sustainable ORE sector. The partners have also agreed that the European Research Infrastructure Consortium (ERIC) structure provides the optimal mechanism to deliver the intended impacts in the long term.

Due to the range of infrastructures required to deliver a MARINERG-i entity on the ESFRI Roadmap, their geographical spread and the nature of their operations and management, a Pan-European distributed research infrastructures (DRI) model under the management of a MARINERG-i central management office is envisaged as the most effective way to structure the MARINERG-i ESFRI entity, hereto referred to as the MARINERG-i DRI.

The MARINERG-i DRI will provide a variety of strategic instruments, a governance model, a coherent structure and operational mechanisms to develop the scientific integration of Europe and to strengthen its international outreach in the area of ORE.

The MARINERG-i DRI business model will ensure it has the stability and means to become a globally recognised and sustainable leader operating a range of pan European distributed ORE research infrastructures and services. This unique business platform will empower and support the scientific development and accelerate the impact of research outputs to realise clean energy extraction from the European coastal waters.

2. Structure – legal, governance, operational

2.1. Business Legal Structure

Due to the nature of operation and legal framework requirements for bringing together pan-European distributed infrastructures with their own legal structures, a range of company governing frameworks were investigated. These ranged from registered companies in individual member states to registered charities in a European member state. However, each of these created difficulties in relation to legal standing and operations between individual member states. Following these studies, **a standardised Energy Research Infrastructure Consortium (ERIC) organisational structure was adopted as the most appropriate legal environment** for the management and governance of the MARINERG-i DRI.

The ERIC structure is a pan-European recognised legal structure established specifically to support an amalgamation of scientific infrastructures operating as a collective body. It enables the establishment and operation of distributed research infrastructures on a not-for-profit economic basis within Europe.

D5.2 documents the evaluation process and final recommendation on the choice of legal structure for MARINERG-i following the deliberations at the Legal Structures Workshop meeting. D5.2 concluded that the ERIC is the preferred option, having received a favourability percentage of 93% in the evaluation process. This recommendation was subsequently confirmed by the members of the MARINERG-i Consortium. The ERIC will be operated in accordance with the Statutes and a set of accompanying Implementing Rules.

2.2. Governance structure

Within the ERIC legal context, the MARINERG-i DRI will adopt a management and governance format as defined in the organogram identified in Figure 1.

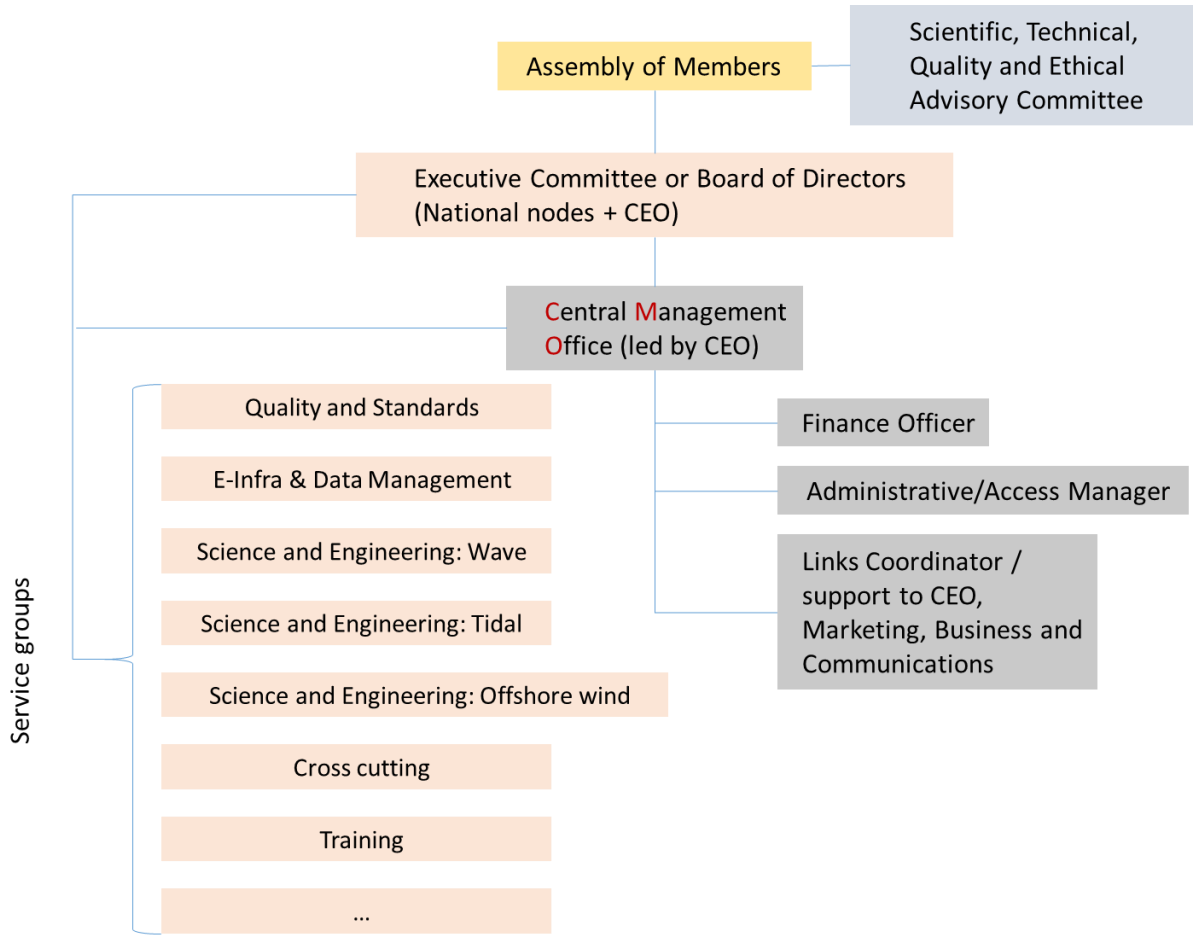

Figure 1 MARINERG-i Corporate Structure

From the above organogram, the **MARINERG-i CEO** and **Central Manage Office (CMO)** will be responsible for the day-to-day operations of the MARINERG-i entity, making decisions on daily operations to efficiently deliver the MARINERG-i DRI. In undertaking these business operations, the CMO will adhere to European employment and contractual legislation, which will be executed through the law of the land in which the CMO is based, together with any financial regulatory compliance and reporting requirements. In the event of any disputes and claims, these shall be governed by and construed in accordance with the law of the land in which the CMO is based and all parties will irrevocably submit to the exclusive jurisdiction of such Courts for the purpose of hearing and determining any dispute arising.

The CMO will take responsibilities for informing and leading the wider international promotion of the MARINERG-i DRI; co-ordinate the engagement of the infrastructures delivering access and services on behalf of the MARINERG-i DRI; and lead the formation of the MARINERG-i DRI through the contracting of participating infrastructures. In developing the business strategy for the MARINERG-i DRI and as the business operations mature, the CMO will work closely with the **Executive Committee (EC).** Ultimate corporate guidance will be provided to the CMO by the EC.

The EC will assume the role of that typically undertaken by a Board of Directors to whom the CMO report and from whom they receive feedback and guidance. Ultimately, the EC have executive powers to nominate and where appropriate, dismiss executive officers who assume day-to-day operational roles within the CMO, i.e. the CEO. The EC will be made up of national node representatives appointed by the Assembly of members. As such, the EC will be made up by topic Experts appointed by each Country member. The EC will also comprise MARINERG-i DRI members responsible for the ultimate delivery of product e.g. the CEO and CMO representatives as required. They will also provide feedback and contributions to the scoping of new additional services to be offered as the MARINERG-i DRI evolves.

A **Scientific, Technical, Quality and Ethical Advisory Committee (STQEAC)** will provide independent advice and feedback on the focus and performance of the MARINERG-i DRI. This will be made up of invited International experts in the respective areas of the STQEAC.

The **Assembly of members** will be made up of a representative appointed by each country who have signed up to be a full member of the MARINERG-i DRI.

The Governance structure and procedures is fully described in D8.3 and 8.4.

2.3. Operational Structure

The **research infrastructures** that will participate in the MARINERG-i DRI will be based in different countries and operate against a variety of in-country regulatory guidelines. Since these infrastructures have different national governing regulations detailing how they operate, the **MARINERG-i Central Management Office (CMO)** will implement the **Contractor-Subcontractor agreements with each of the participating research infrastructures.** Adopting and implementing this Contractor-Subcontractor flexibility allows the CMO to accommodate the different legal ownership and operational management criteria governing individual infrastructures. This also facilitates the accommodation of national regulations influencing each of the infrastructures' engagement and operation within the MARINERG-i DRI framework.

Within the Contractor-Subcontractor agreement, the **CMO will act as the 'Contractor'**, while the '**Subcontractor' will be the individual infrastructure**. The agreement between the Contractor and Subcontractor will cover the **rules of operational engagement** of the infrastructure within MARINERG-i DRI activities. This will identify:

- the benefits to be gained by the infrastructure by being part of the MARINERG-i DRI;
- the contractual requirements covering operations;
- the fee collection process to be adopted by the Infrastructure;
- the engagement and management of user access and service delivery when undertaking MARINERG-i DRI activities;
- the payment procedures of all fees, levies and/ or commission to be paid to the CMO by the Infrastructure;
- the promotion of the infrastructure by the MARINERG-i DRI;
- the support given to the infrastructure when undertaking MARINERG-i activities;
- and future infrastructure investment and development.

Initially the MARINERG-i CMO will have the responsibility to actively promote all distributed infrastructures making up the MARINERG-i DRI to the wider International ORE research and industry communities and user groups. The MARINERG-i CMO will also engage with potential infrastructure users and sell the benefits of testing at a MARINERG-i DRI infrastructure. Once the Contractor-Subcontractor agreement has been put in place, in addition to the CMO promoting MARINERG-i DRI testing benefits and seeking infrastructure users, each infrastructure will also promote MARINERG-i DRI engagement benefits and seek users.

The access is agreed and implemented using the contractual agreement made between the User and the Infrastructure. Therefore, once a user has been introduced to a specific infrastructure, it then becomes the infrastructure's responsibility to:

- conclude the Provision of Service Agreement;
- manage the user testing contract;
- oversee the coordination of fee setting and the collection of fees.

The agreement will also address the securing of local consenting requirements, if required, and any requirements for indemnity insurances in order for the infrastructure to provide access and deliver the required service.

3. Market assessment and demand

The access to and **utilisation of European-based but internationally leading researchers**, experienced in ORE research and development, is central to the value proposition. This, together with members' **comprehensive engagement in major ORE initiatives** (such as the **EC MaRINET and MaRINET2 programs**), means that the MARINERG-i DRI is ideally placed to assess the demands of industry on ORE research and develop services to meet market demands.

The **EC MaRINET and MaRINET2 programmes** of work have facilitated the completion of a comprehensive market survey. The access and research activities undertaken have **demonstrated the feasibility of a research infrastructure to support ORE development, identifying the specific facility types and a range of services essential to satisfy existing market demands.** The engagement within and management of these MaRINET and MaRINET2 projects (UCC coordinator) has been used to

a) identify the specific infrastructures to be included in a MARINERG-i DRI in order to provide initial sustainability of the business.
b) identify emerging infrastructure types required to satisfy future demands as well as to facilitate service provisions to the wider ORE sector.

The latter infrastructures and services will be included in the second stage of the MARINERG-i DRI business development together with additional infrastructures requesting associate and full membership, where a viable and sustainable business case or business opportunity can be demonstrated.

The MaRINET programmes have also **undertaken a digest of infrastructure access data** from more than 40 pan-European infrastructures and laboratories engaged in ORE research and development and covering a period of approximately 10 years. This information and experience has been used to **inform the MARINERG-i assessment of market demands in relation to infrastructure access; types of usage; duration of access to undertake testing/ evaluation; as well as the types of instrumentation; and data collection requirements.**

The information collated from the MaRINET and MaRINET2 programs has also been **used to establish the proposed business model to be implemented upon initial MARINERG-i DRI launch and operation.**

4. Business model

4.1. Overview

The MARINERG-i DRI business model operating as an ERIC legal entity will include **16 testing facilities/ infrastructures** initially servicing **scale model and sub systems testing and performance evaluation of wave, tidal and offshore wind systems.**

In a similar manner to MaRINET and MaRINET2 initiatives, these infrastructures will make available to MARINERG-i up to a maximum of 20% of their available access time to service the existing demand, which is currently not satisfied by any formal collective provider. With infrastructures having on average an annual availability of 44 weeks per year and each infrastructure making available a **conservative 6% of their access time**, this results in the initial MARINERG-i DRI working with infrastructures spread across **7 European states** and providing **42 weeks of access in the first year of revenue generation.**

A **chart of the MARINERG-i DRI business model** and its development towards sustainability when operating as an ERIC legal entity has been produced and is shown in Figure 2.

1. The path to sustainability commences with the succession of the MARINERG-i H2020 project to the **ESFRI roadmap**, with anticipated acceptance by the end of Q4 in **2021.**
2. Once accepted on the ESFRI road map, the consortium of the proposed MARINERG-i DRI will prepare the required legal framework and business structure together with securing the required political and funding commitments as well as the participation of initial infrastructures required to facilitate **an application to become an independent legal entity.** It is anticipated that the application to be recognised as an ERIC will be made at the end of Q4 2024, with granting of formal recognition anticipated at the beginning of Q1 **2026**.
3. At which point the MARINERG-i DRI has a legal framework to allow it to **begin trading as a not-for-profit entity.**

The timelines reflected herewith capture similar timescales associated with other ESFRI entities applying to and being awarded ERIC legal framework status. Therefore, these timescales are recognised as realistic.

MARINERG-i DRI timeline

Year	2017-2019	2020				2021				2022				2023				2024				2025				2026				2027				2028				2029				2030	
Quarter		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	...	
ESFRI Phase	Design									Preparation																Implementation																Operation	Decommissioning
H2020 MARINERG-i project																																										
ESFRI & funding applications*																																										
Submit ESFRI application																																										
ESFRI Roadmap acceptance																																										
Infradev 2 proposal																																										
INFRADEV 2 support for preparation																																										
ERIC & funding applications *																																										
Submit ERIC application																																										
ERIC status awarded																																										
Infradev 3 proposal																																										
INFRADEV 3 support for implementation																																										
Limited Pilot of Access																																										
Country membership income																																										
Commission based testing income																																										

* using country support e.g. in-kind contributions from RI staff; national grants or EU funding where available e.g. WeCANET or other related projects such as MaRINET2

Figure 2 MARINERG-i DRI operational plan towards sustainability

4.2. Launch and initial operation

This initial phase of business operations during the launch and initial development period will be a **pre-revenue generation activity** and will be **supported by** investment funding from **grant support mechanisms** available for initiating and ascending to the ESFRI Roadmap, e.g. EC InfraDev. Additional support will be sought via capital generated through **local funding secured at in-Country level** and **local infrastructure investment** to support gearing up to become an ESFRI entity.

In order to launch and grow the MARINERG-i business and achieve sustainability of the MARINERG-i DRI, the adoption of a **'lean-burn' management and operational model** will be essential. To achieve this, overheads and operational costs will need to be minimised during this initial period in order to reduce the burden of high cash burn resulting in immediate vital revenue generation activities. This approach represents good business practice to be adopted during the start-up phase and early operational years to support the required business growth. Upon the launch of the MARINERG-i DRI, this will initially look to **maximise in-kind contributions from its membership** in order to minimise the actual 'hard cash burn' associated with operating the business. The **use of staff secondments** to establish initial traction of the MARINERG-i business at start up is desirable and has been a highly successful approach adopted in other similar initiatives. Not only will these secondments **provide the required initial restriction on salary budgets**, it also provides **immediate access to and utilisation of staff with the necessary knowledge and skillsets** to get the MARINERG-i business operational and functioning in the earliest possible time frame. The adoption of this approach will result in **minimal time delays** in establishing the MARINERG-i DRI **when recruiting and appointing staff** and undertaking extensive staff training. This **'fast-start' approach** enables the MARINERG-i DRI to become business operational at the earliest opportunity, post launch.

The day-to-day management of the MARINERG-i DRI will be undertaken by the CMO, which is proposed to be located in Ireland. This is due to existing experience and strong Irish Government support/ commitment to hosting the CMO. The CMO will be populated by staff either employed directly by the CMO and/or staff seconded from one of the related/sub-contracted infrastructures making up the membership. The CMO will be headed up by a CEO who will assume executive and legal operational responsibilities. The immediate establishment of the MARINERG-i DRI CMO will provide the required responsible entity that assumes executive powers, manages MARINERG-i operations and overseas business development and execution. One of the **first operational tasks** of the CMO will be the **collation and contracting of infrastructures** to be included in the MARINERG-i DRI as the 'Subcontractor' operating under an ERIC legal framework.

Delivering the service aspects of the MARINERG-i DRI when operating as an ERIC legal entity brings together leading international ORE infrastructures to offer a wide range of research, testing and performance evaluation services to a global ORE market. These services will be secured in a manner whereby recovery of all costs associated with the MARINERG-i infrastructure access is secured from the user by the infrastructure directly, alleviating these responsibilities from the MARINERG-i DRI CMO. **A percentage based levy based on the access fee charged for the MARINERG-i DRI access will be paid by the commissioned infrastructure to the CMO.** This levy is paid to cover the MARINERG-i DRI and CMO operating costs and build a fund to be re-invested in Infrastructure upgrading to maintain the MARINERG-i ESFRI Infrastructures' internationally leading position.

4.3. Evolution and development

The initial MARINERG-i DRI business model will **focus on the provision of access** to its members' ORE infrastructures where an **already proven demand for service provision exists.** This will be the post launch targeted market sector as it provides the **quickest route and lowest business risk** to initiate and expand revenue generation.

The development of the business will subsequently be phased the **number of infrastructures** to be included within the MARINERG-i DRI portfolio will be continuously **expanded to provide extended service provision for the growing market demands.**

The **range of services** offered to the sector will continue to be **expanded** in response to growing market requirements and include market expansion targeted **towards the wider offshore engineering industry sector.**

During the post launch period, **additional market analysis** on current ORE developments will be undertaken. This will **inform each subsequent round of expansion** of infrastructures and services needed to satisfy new and emerging ORE market trends. Potentially, this phase of business development (towards the end of Year 2 2027/ early Year 3 2028) may include **non-EU based international service providers**, since early trends are emerging of a market swing towards increased ORE development in North America and East Asia.

In addressing further-out business development, i.e. **Year 4 onwards** (2029), continuous ORE and offshore energy market scoping and assessment will be maintained. These will be used to inform future MARINERG-i DRI evolution of the phased business development program towards the end of Year 4. It is highly likely this will include a **widening of the infrastructures participating and services provided** by the MARINERG-i DRI to potentially include **subsea supporting engineering and services**, e.g. ROV's, UAV's, system interaction/ intervention engineering, etc.

4.4. Expenditure: CMO Operational Overheads

During the initial business development and pre-revenue generation phase of the MARINERG-i DRI, it is vital that all expenditure is managed to ensure only essential spending is undertaken to deliver the initial business objectives and meet the completed tasks and stage gates of the MARINERG-i DRI formation, as identified in table 1. The **costs** incurred during this phase are associated with the **setting up and staffing of the CMO**; and the **formalisation and establishment of the preferred 'Sub-contracted infrastructures'** who will deliver the MARINERG-i DRI service provisions.

Table 1 Tasks delivered during MARINERG-i DRI Formation

	2022				2023				2024			
Tasks/ Stage Gates	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Establish MARINERG-i CMO												
Engage with DRI's												
Contract DRI's												
Investment in DRI's												
Prepare ERIC application												
Submit ERIC application												

The financial modelling, as identified in

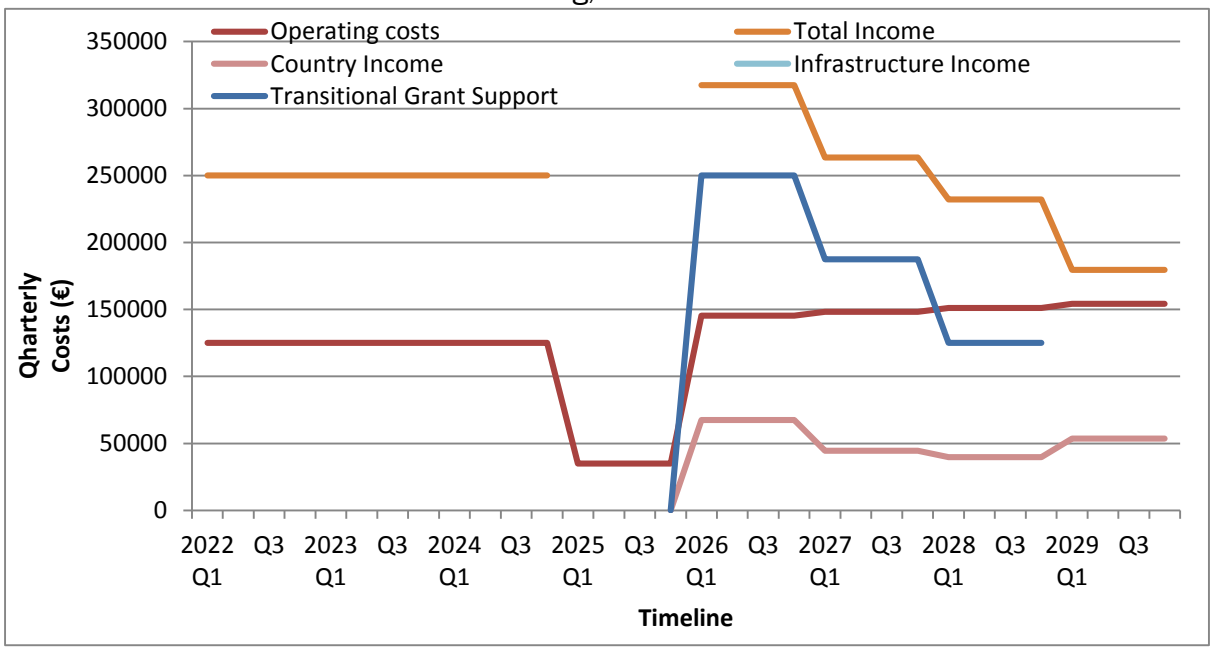

Figure 3, shows the establishment of the MARINERG-i DRI in 2022 and its formation and structure as a functional body up until the end of 2024. Until an ERIC legal status is bestowed on the MARINERG-i DRI it is not in a position to be revenue generating through trading as a legal entity. **Prior to MARINERG-i having a recognised legal trading status**, this period of activity will **require EC grant support vehicles established specifically for the development and formation of DRI's.** Some of the funds from income received minus operating costs will **be reinvested in infrastructures to bring them up to a uniform high level of operation.** Table 2 identifies the grant support being targeted for the MARINERG-i DRI formation and preparation; and submission of the ERIC application.

Table 2 Costings MARINERG-i DRI Formation to the stage of submission of an ERIC Application

	Year 1 (2022) (€)	Year 2 (2023) (€)	Year 3 (2024) (€)
MARINERG-i DRI Formation and Operation costs	500,000	500,000	500,000
Infrastructure investment and standardisation	500,000	500,000	500,000

On the basis of the **ERIC legal status being awarded** to the MARINERG-i DRI at the start of **2026**, the **initial cash burn** within the first 3 months (Quarter) of the launch of the MARINERG-i DRI operating under an ERIC legal framework is approximately **€48,000 per month.** This initial expenditure will be accounted for against **income received through in-country participation payments (country membership fees)** and **transitional grant support from the EC** available to support initial DRI operations under an ERIC legal framework as it evolves towards financial sustainability.

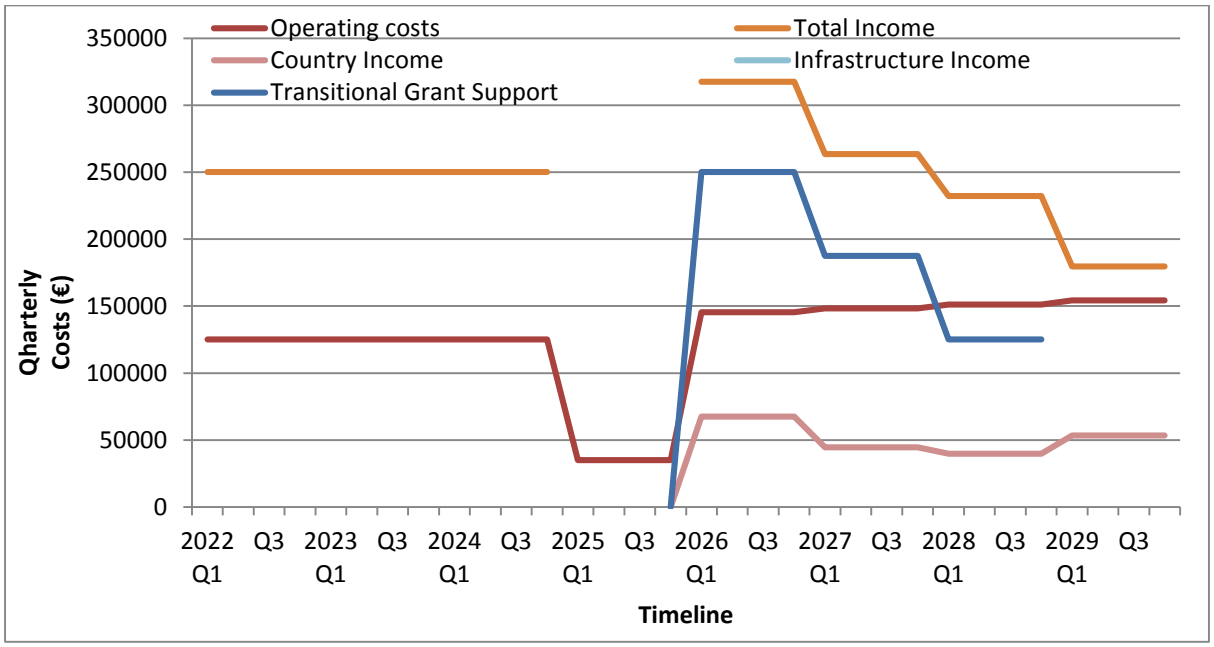

Figure 3 Financial model of MARINERG-i ESFRI Project

As identified in the Figure 3 financial modelling, the cash burn associated with the operations of the MARINERG-i DRI increases annually in line with inflation. From an annual cash balance, a **cash surplus generated at the end of Year 1 (2026) is required for use to aid the transition to financial sustainability at the end of Year 4 (2029).**

Table 3 identifies the grant support being targeted for the MARINERG-i DRI implementation phase including a Limited Pilot of Access activity and transitional support for the initial three years of legal operation as an ERIC for time periods 2026-28.

Table 3 InfraDev 3 support for the MARINERG-i DRI during the initial 3 years of ERIC operations.

	Year 1	Year 2	Year 3

	(2026) (€)	(2027) (€)	(2028) (€)
InfraDev 3 transitional support for MARINERG-i DRI operation and the Limited Pilot of Access	1,000,000	750,000	500,000

The initial cash surplus (start year 1 from grant support) will provide funding for **a limited pilot of access** to developers as identified in Figure 2. While it is anticipated that paid access will increasingly contribute to the cash flow, the MARINERG-i DRI envisages providing **sessions of free access** funded by cash surplus brought in **via income generated as outlined in**

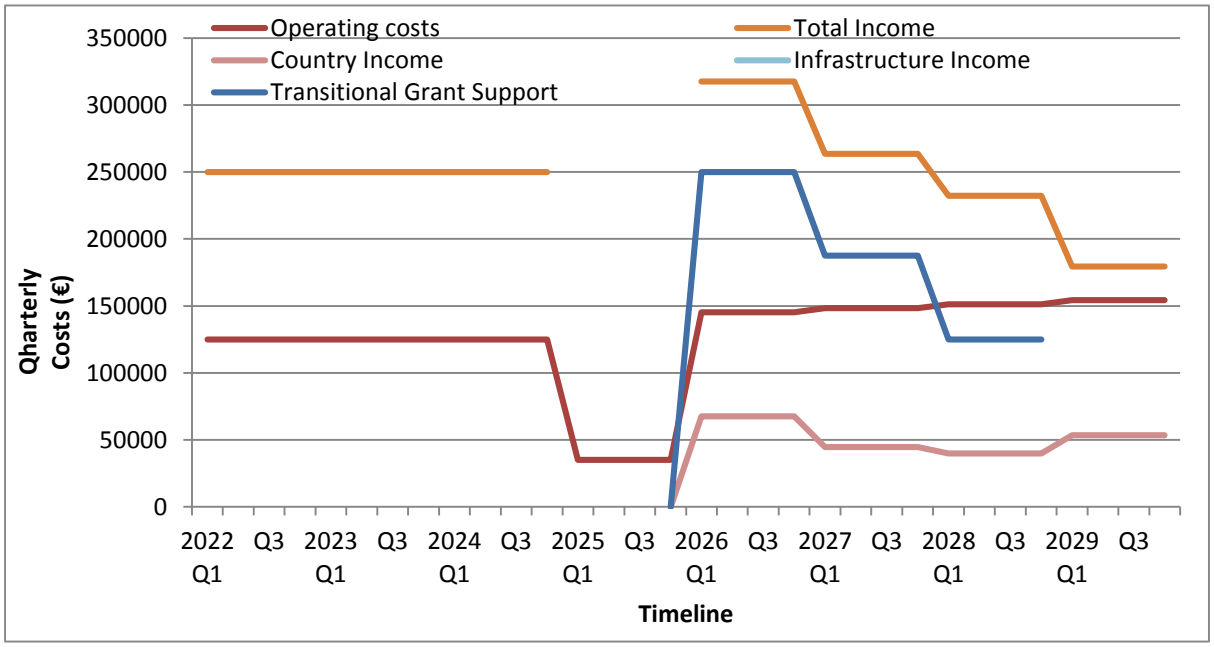

Figure 3 as well as continued application to relevant projects and national funding schemes. Selection for free access will be geared towards complementing the common science plan outlined in D4.3, which describes the research most needed to develop the ORE sector.

In moving into Year 2 (2027), the **revenue generation from infrastructure service provision** begins to contribute to the cash flow. In line with this, **the in-country (membership)** contributions in the form of set membership fees reduce, together with **monies from the transitional grant support.** A smaller **cash surplus generated at the end of Year 2** will be used to aid the transition to financial sustainability at the end of Year 4.

Operations in Year 3 (2028) project an **increase in country membership numbers while reducing the specific membership fees.** An **increase in the number of access provisions and services** offered is anticipated, which results in **increased revenue generation**. This may generate a **small surplus**, which will be used to support the transition to financial sustainability of the MARINERG-i DRI post Year 4.

It is anticipated that there will be an increase in the number of member countries in Year 4 (2028) and thus, **revenue from membership fees will increase**. An **increase in the service provision** delivered by the increased number of infrastructures is also anticipated, which

results in a healthy increase in revenue generation associated with infrastructure access. The **transitional grant support income is reduced accordingly** and in-line with the growth in revenue generation activity. As such any small surplus generated will be assigned to support the operations of the MARINERG-i DRI as a sustainable financial entity post year 4, i.e. 2029 onwards. At this point, the revenue generation from increased service provision and increased membership fees will provide the necessary financial income to meet the MARINERG-i DRI operating costs and provide a small surplus. From this point onwards, any surplus funds generated will be used to fund MARINERG-i research programmes and re-invest in the infrastructures to ensure the MARINERG-i DRI remains at the forefront of International ORE research and development.

4.5. Income: Operational revenue generation

MARINERG-i DRI **income streams** will primarily be based on a mixture of

- 'Contractor' hosting fees,
- 'Subcontractor' Country membership fees
- and facility access fees/service provision levy.

The latter of these revenue streams becomes more prominent as the business matures towards sustainability. Upon launch of the MARINERG-i DRI, income will be initially restricted to potential **grant awards from 2022- 2024**. With such limited initial income streams, management of immediate expenditure needs to be prudent. **Post 2026** and the award of an ERIC legal status, the income stream increases to include **annual country hosting and membership fees** which provides a consistent and predictable income stream during the operations of the MARINERG-i DRI post ERIC legal status award. As these income streams are finite, it is neither economically viable nor sustainable to offset operational costs against the membership fees; otherwise the level of funds required to be raised from membership fees would result in the fees being set at a level which may discourage countries from seeking/renewing membership. Table identifies the income streams post ERIC legal status award (2026). It must be noted that assumptions related to number of memberships and associate partners were made, but they are based on the participation interested expressed through national surveys to interested parties. This information is collated from MARINERG-i Deliverables 6.2, 6.3 and 7.6.

Table 3 MARINERG-i DRI revenue streams post ERIC award

	Year 1 (2026)	Year 2 (2027)	Year 3 (2028)	Year 4 (2029)
Hosting Partners	1	1	1	1
Full Members	6	8	12	14
Associate Members	4	7	10	12
Hosting annual fee (€)	110,000	66,000	44,000	44,000
Membership annual fee (€)	20,000	14,000	10,000	10,000
Associate members annual fee (€)	10,000	7,000	5,000	5,000
Infrastructure access weeks	0	42	90	168
Infrastructure weekly access costs (€)	20,000	20,000	20,000	20,000
Access levy paid per access weeks (%)	15	15	15	15
Income (€)	270,000	353,000	484,000	748,000

In order for the MARINERG-i DRI to be financially sustainable in the longer term, **the main income stream will need to be targeted towards the infrastructure access levy** paid in association with infrastructure access and service provision delivered by 'Subcontractors' under the MARINERG-i DRI. Building this revenue stream provides a market based route to delivering a sustainable business while providing the resources needed to re-invest in the improvement and expansion of the MARINERG-i DRI facilities and services. This is

identified in Figure 4, which shows the quarterly surplus-deficit model for MARINERG-i operations as it evolves towards being a sustainable business.

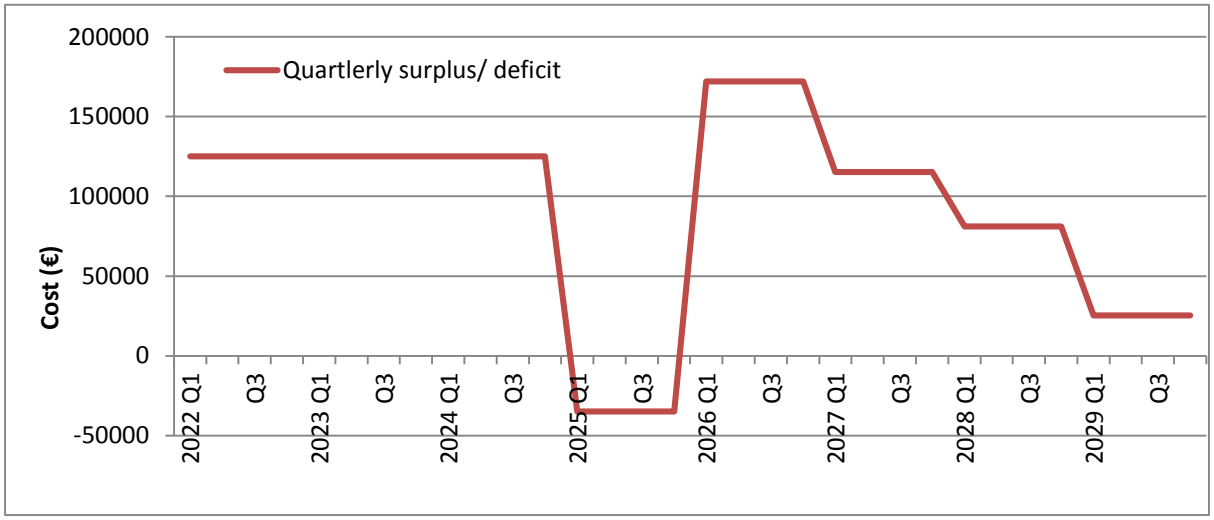

Figure 4 Quarterly surplus-deficit Cash Flow for a MARINERG-i DRI

During the 2022- 2024 period when the MARINERG-i DRI is being established as a legal and operating entity, the surplus cash flow generation is re-invested into the upgrading and standardisation of equipment infrastructures will be expected to use during the initial MARINERG-i DRI. This access to grants/resources to facilitate these upgrading measures demonstrates how individual countries and related infrastructures create value and benefit from being part of the initial infrastructures making up the MARINERG-i entity.

In 2025, the deficit identified is associated with the ERIC application period. At this time there is no grant support available while waiting for the award of an ERIC legal framework and as the MARINERG-i DRI has no legal trading status at this point it is not in a position to provide services to generate revenue. Managing this short fall will be achieved through scaling back of management operations to a lean-burn model, reducing the annual CMO running costs to €140k. **This short fall will be met via the hosting and member countries providing advanced membership and/or nominal grant support.**

5. Market Promotion

Upon launch, initial market promotion will be managed and overseen by the MARINERG-i CMO. This will engage with the international research communities, industry representative bodies and direct marketing towards researchers and businesses who will be the potential users of the MARINERG-i DRI services. Upon the establishment of the MARINERG-i Service Groups, they will increasingly become more involved in the promotion of MARINERG-i DRI services and functions. Promotion will target the international ORE research communities and industrial sectors in the early stages of research and technology development. The scope and targeting of market promotions from Year 3 (2028) of operation will be aimed at a broader marine energy/engineering systems market where the MARINERG-i DRI services are equally applicable.

6. Conclusions

The MARINERG-i DRI operating within an ERIC legal framework has strong potential to be economically sustaining by the end of a 5 year period from when it starts trading. This can be achieved by offering infrastructure access and providing services to initially the ORE sector, before expanding these to a wider offshore engineering research and industry sector. This pathway to earlier financial sustainability is achieved through the adoption of a lean-burn CMO operational model where overheads are minimised. This is achieved by keeping the salary bill as low as possible without compromising operational functionality, utilising support in kind from the country host, and taking advantage of competitive premises rent. The successful development and delivery of the MARINERG-i DRI will be realised through the delivery of research, infrastructure access and service provisions to a global marine engineering market.