marinerg-i

Marine Renewable Energy Infrastructure

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Financial model and sustainability projection

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Abbreviations

DRI	Distributed research infrastructure
ESFRI	European Strategy Forum on Research Infrastructures
RI	Research infrastructure



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1. Introduction

Research Infrastructures (RI) have been long recognized as crucial to fostering research and innovation in Europe, and across various fields of study there has been an increasing number of new RIs. The long-term sustainability of these RIs has been a priority of the European Commission and the European Strategy Forum on Research Infrastructures (ESFRI), with consultations in 2016 [1] and a report with recommendations in 2018 [2]. The main recommendations established in the latter are:

- 1. Establish and maintain excellence through the entire lifecycle of RIs by all appropriate means, by securing adequate framework conditions, and by opening the RIs up to the world.
- 2. Ensure that RIs have the right people in the right place at the right time by strengthening and harmonising national research and educational systems to make sure that all essential skills are available.
- 3. Harmonise and integrate a vision for convergent operation of RIs and e-Infrastructures in Europe to ensure cost-effective service provision to the user communities.
- 4. Fully exploit the potential of RIs as innovation hubs by incorporating strategies for their development into national and European innovation policies.
- 5. Set up effective means of determining the economic and wider social value of RIs and incorporate these benefits into science-policy-society dialogues.
- 6. Establish adequate framework conditions for effective governance and sustainable long-term funding for RIs at every stage in their lifecycle, together with effective management.
- 7. Foster broader coordination at National and European levels when designing processes for planning and supporting national and pan European RIs and so enhance their strategic value. [1]

MARINERG-i proposes to establish a modern, efficient, high-quality, state-of-the-art ecosystem of different members and stakeholders for cutting-edge research in ocean and offshore wind energy, in a distributed research infrastructure. It will exist in the ESFRI context and so, will need to prove its viability and long-term sustainability.

In order to assess the viability and the long-term sustainability of the distributed research infrastructure (DRI), a financial model was built, with basis in the chosen governance framework, detailed in D5.6 [3], and coordinated with the business model developed in WP8.

The financial model assesses the costs of implementing and operating the DRI, and estimates the revenues based on the business model, detailed in D8.2 [4]. The financial model is also used identify and quantify the possible risks to the long-term sustainability,

This deliverable is a guide to the financial model built for MARINERG-i. It also provides an overview of the analysis of the long-term sustainability of the distributed research infrastructure, which is articulated with the final business plan presented in D8.2 [4].



2. Methodology

In order to estimate the viability of the MARINERG-i distributed research infrastructure, a financial model was built. The model follows a standard methodology of estimating costs, both for implementation and operation of the DRI, and estimating revenues, and summarising theses values into a balance sheet. Different cost assumptions can be modelled allowing the impact on the feasibility of the distributed research infrastructure to be seen.

The model also includes a sensitivity analysis of the main inputs and sources of risk for the long-term sustainability of the DRI.

The MARINERG-i financial model is built using Microsoft Excel¹, which is a familiar tool, available to the consortium, and allows for easy expandability in the future as needs arise and decisions are made regarding the makeup of the DRI.

The cost assumptions in the model were established during the Financial & Business model workshop in Cork, and are articulated with those presented in the final business model [4]. It is structured to match the governance model detailed in D5.6 [3].

3. Model description

3.1. Overview

The model is built using different sheets to provide modularity. The initial tab (Figure 1) shows the details of the version of the model and provides a legend for the different types of fields.

Fields with an orange background are required inputs and are needed to make calculations within the model. Calculated inputs have orange text and grey background. These fields have formulas, but the values can be replaced by user inputs. However, *overriding fields with formulas breaks the link with the previous cells*. It is suggested that any edits done to the model are done in a new save, in order to preserve these links. Outputs and other information data are formatted with black text.

¹ The model can also be opened in freeware alternatives such as Google Sheets, OpenOffice Calc or LibreOffice Calc. The model should be fully functional in these tools, but it has not been tested extensively. There might be differences in formatting in software other than Microsoft Excel.





Client				
Description	This model estimates t balance.	the costs of implementin	g and running the distributed research infrastructure MARINERG-I. It provides tools to assess revenues and to optimize the operating	
Version	v0.5			
Date	31-05-2019			
Contact				
Instructions	Field Colour	Field Type Required input	Description Key Project specific inputs Linked to other cells. Insert your desired values	
	value	Calculated Input	Input calculated within the model, linked to other cell. Can be changed, but calculation will be lost.	
	value	Output	Final output, not linked for calculation of other cells	
	value	Information Data	Project information/comments. Not linked to other cells. Insert your desired information.	
			Start >	

Figure 1 'Intro' tab

3.2. Setup

The initial setup tab allows the user to define the member list (Figure 2) for the MARINERGi DRI, the mode of participation, and the infrastructures present (Figure 3).

The member list includes the following fields to describe the members:

- Entity: name of entity, which can be a country or an organization
- Entity type: as defined by the ERIC statutes. Members can be:
 - Member State: Member States of the European Union
 - Associated Country: not a Member State of the European Union, but a party to an International Agreement with the European Commission and makes a financial contribution to all or part of the European Commission's research, technological development and demonstration programmes.
 - Third country: Third countries other than Associated Countries
 - Intergovernmental organisation

The following fields are used in relation to participation in the DRI:

- Mode of participation: as defined in D5.5 [5], participation in MARINERG-i can be as
 - A Participating Member
 - o An Observer Member, which does not have voting rights
- Host: Yes/No field to determine if the entity will be the central hub host
- Service Group Host: Yes/No field to determine if the entity will be host to a service group
- Service Group: Name of the service group hosted
- Regional Team Lead: Yes/No field to determine if the entity will be the lead of a regional team
- Regional Team: Name of the regional team



The final fields of the table are calculated based on the infrastructure list but can be overridden² in this table. These fields are:

- Number of institutions/institutes participating
- Number of laboratories
- Number of access units from laboratories
- Number of test sites
- Number of access units from test sites
- Total number of RIs (labs + test sites)
- Total number of access units (labs + test sites)

	Parameter				Value		Comments									
	Unit of Access				week		Unit of access for b	asis of calcu	lation,	may not corr	espond to	o infrastructu	e unit of	access		
mber list																
				Participatio	on Basis				Nun	ber of partic	ipating in	nstitutions and	d Infrastr	uctutes		
ity	Entity Type	Mode	Host	Service Group Host	Service Group	Regional Team Lead	Regional Team	N. of Institutes	N. of Labs	N. of Units of Access	N. of Te Sites	st N. of Units of Access	Total N. of Ris	. Total N. of Units of Access		
	Dropdown	Dropdown	Yes/No	Yes/No	Description	Yes/No	Description			Labs		Test Sites				
and	Member State	Participating Member	Yes	No		Yes		2		3 25	5	1 20		4 45		
ted Kingdom	Member State	Participating Member	No	Yes		No		5		5 2	5	0 0		5 25		
aium.	Member State	Participating Member	No	NO		NO		0		1 5		1 5		2 10		
gium	Member State	Participating Member	No	Yes		No		0		2 IU 3 19		0 0		3 15		
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many	Member State	Participating Member	No	No		No		0		1 5	5	0 0		1 5		
herlands	Member State	Participating Member	No	No		No		0		2 10)	0 0		2 10		
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way	Associated Country	Observer Member	No	No		No		0		0 ()	0 0		0 0		
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nmark	Member State	Observer Member	No	No		No		0		n (,	0 0		0 0		
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nmary																

Figure 2 Member setup

The infrastructure list is used to detail all the infrastructures participating in the DRI. The values are summarised in member list table, and as mentioned previously, can be overridden by the user. This means that at an early stage, when there is uncertainty on which RIs will be included, this section can be ignored.

The infrastructure list has the following inputs:

- Infrastructure: name of the infrastructure
- Type of infrastructure: dropdown of the 5 types of RIs available in the DRI:
 - o Small lab
 - o Large lab
 - Medium-scale site
 - Large-scale site
 - E-infrastructure
- Institute: name of the institute/institution managing the RI
- Country: dropdown of the countries that were input on the member list.

² NOTE: overriding fields with formulas breaks the link with the previous cells. It is suggested that any edits done to the model are done in a new save.



- Number of units of access
- Unit of access: time-range of the unit of access, a choice between days, weeks and months
- **Cost per unit**: average cost per unit of access. At present, this field is merely informative, but it can be used to calculate the revenues for a commission-based business model.

etup of participa	ating countries, mode	of participation and a	access units				
	Parameter				Value		Comments
	Unit of Access				week		Unit of access for basis of calculation, may not correspond to infrastructure unit of access
Aember list							
nfrastructure Lis	t						
				N. units of		Cost of per	
drastructure	Туре	Institute	Country	access	Unit of access	unit	
	Dropdown		Dropdown		Dropdown		
ĸ	Large lab	UR	Ireland		5 week		
ĸ	Large lab	UR	Ireland		5 week		
x	Large lab	UR	Ireland	1	5 week		
x	Medium-scale site	e Smart Bay/Marine	Institreland	2	0 week		
c	Small lab	Exter	United Kingdom		5 week		
с. С	Large lab	Edinburah	United Kingdom		5 week		
	Small Jah	Strathclyde	United Kingdom		5 week		
	Small Jab	OUB	United Kingdom		5 week		
• •	Large Jab	400	Spain		5 week		
<	Large-scale site		Spain		5 week		
¢	Large lab		Belgium		5 week		
c	Small lab		Belgium		5 week		
c	Large lab		France		5 week		
x	Large lab		France		5 week		
x	Small lab		France		5 week		
x	Small lab		Germany		5 week		
x	Large lab		Netherlands		5 week		
x	Large lab		Netherlands		5 week		

Figure 3 Infrastructure setup

At the end of the tab a small summary table is presented (*Figure 4*), with an overview of the number of members by participation mode, and the number of infrastructures and access units by type.

There is also a column for inputs for the long term-targets of the MARINERG-i DRI, which will be used in the cashflow analysis.



1. 1.6. 1.1. 1.1			
arinerg-i Tinancial Model Setup of participating countries, mode of participation and access units			
Parameter	Value	Comments	
Unit of Access	week	Unit of access for basis of calculation, may not correspond to infrastructure unit of access	
Member list			
nfrastructure List			
Summary			
Number of Participating Members	Current 7	Target Long Term 15	
Number of Observer Members	5	12	
Service Group Host	3	5	
Regional Team Leads	1	5	
Number of Institutions	7		
Number of Infrastructures Labs	19 17		
Test sites	2		
Labs Test sites	95	100	
Law data design law becaute and law of the	Devenues Delance Chest Constitu		

Figure 4 Setup summary and long-term targets

3.3. Timeline

The inputs on the Timeline tab (*Figure* 5) are the key dates for the implementation and establishment of the DRI:

- Preparation, submission and approval on the ESFRI roadmap
- Preparation, submission and approval of the ERIC statutes
- Preparatory, implementation and operational phases of the MARINERG-i DRI
- INFRADEV funding timeline

The information on this tab will be used for the cashflow analysis.





]			••• 🕀	
Marinerg-i financial mod	lel			F
Definition of key dates of the implement	itation of Marinerg-i			t.
				ł
Project Phases				
ESFRI timeline	Start End	Commands		
Preparation of ESFRI proposal				
Submission of FSERI proposal				
Result of ESFRI/inclusion on Roadmap	jan-21			
ERIC timeline	Start Ead	Commands		
Preparation of ERIC proposal	jan-23 dez-24	Comments		
Submission of EBIC proposal	ian-25			
submator of Enc proposal	Juni			
ERIC is legally binding	jan-26			
MARINERG-I timeline	Start End			
Preparatory phase	jan-17 jan-21	comments Preparatory phase ends when MARINERG-I is accepted into the Roadmap		
hand a second	the as the as			
implementation phase	jan-21 jan-20	imprementation phase starts when MAHRINEKG-1 is accepted into the koodamap, and ends once the ERL is regard binding		
Operational phase	jan-26 dez-35	Operational phase starts when ERIC is legally binding		
INFRADEV timeline				
INFRADEV-1	jan-17 jun-19			
W/704052/ 2	ine 22 day 24			
INFRADEV-2	Jan-22 Gez-24			
INFRADEV-3	jan-26 dez-27			
intro Setup Timeline	Implementation Costs Operational Cost Personner	Ralanze Cheet Sencifivity Data (A)		
into setup limetine	ingenite and costs operational cost Revenues			

Figure 5 'Timeline' tab

3.4. Implementation Costs

In this tab the costs associated with the implementation phase of the MARINERG-i DRI are specified (*Figure* 6). These costs are related to the ERIC proposal preparation, and upgrading and standardising the participating RIs.

The costs are divided into the central hub, the service groups, the regional team lead and the country nodes.

For the implementation and operating costs, selecting from a dropdown in each subsection defines who will burden the costs (the DRI, the country node or the RI).



Marinerg i financial model		
Definition of implementation Costs		
Dorometer	Value Commente	
Purumeter	vuide comments	
Central Hub		
Costs inputable to	MARINERG-I DRI	
Admnistrative Costs		
ERIC Formation and Operation costs	1.500.000 € €	
XXX	e e	
XXX	e e	
XXX	e.	
жж	e	
Contingency	e	
Tatal		
Total	1.500,000 €	
Construction Costs		
Infrastructure investment and standardisation	1.500.000 €	
XXX		
xxx		
XXX		
Contingency	e	
Total	1500000	
TOTAL	3,000,000 €	
10 ML		
Service Group		
Costs inputable to	MARINERG-I DRI	
TOTAL	0 C C	
Regional Team Lead		
Costs inputable to	MARINERG-I DRI	
TOTAL	0 C	
Country Marke		
country node		
Costs inputable to	Country Node	
TOTAL	0€€	
the test term in the second second	where the second s	
Intro Setup Timeline Implementation Costs O	rrational Cost Revenues Balancé Shéét Sénsitivity Data (+)	4

Figure 6 'Implementation Costs' tab

3.5. Operating Costs

The operating costs (*Figure 7*) are also separated into different sections:

- Central Hub
- 6 Service Groups
- Country Node

For the service groups a dropdown list is used to select the corresponding service group³.

Furthermore, for each section, it is possible to define a pre-filled scenario by using the corresponding dropdown (*Figure* 8). Five options are available:

- Full
- Medium
- Lean
- None/Custom
- Global

The Full, Medium and Lean options relate to the different scenarios (or modes of operation).

The None/Custom option allows the user to specify the percentage of the base costs to be considered, or, in the absence of values, to consider them as null.

The Global option sets the choice to the option selected from the dropdown at the top of the sheet.

³ The definition of service groups is done on the data tab



Internet Konnet/En Arometer Service Group 1: Science & Engineering Research Service Group 1: Science & Engineering Research Service Group 2: Science & Engineering R	Definition of Operating costs. Different scenarios are pos	sible: lean, medium, full, and custom. For custom scenario, % of base costs and	Global Scenario Lean		
Description Second Medium	FTE must be filled in		Scenario Inputs	3	
Central mail Kentral Kentral Kentral Service Group 1: Sterce & Engineering Research Scenario Global Service Group 2: Der Selection CentrativeCture & Data Management Service Group 1: Der Selection Scenario Global Service Group 1: Der Selection Scenario Global Service Group 2: Der Selection Scenario Global Service Group 2: Quality & Standards Scenario Global	Parameter Control Muh		Frequelo		
Service Group 1: Steine & Englemening Research Sonaria Global Service Group 1: Linfrastructure & Data Management Sonaria Global Service Group 1: Steine Selection Data Falection Sonaria Global Service Group 1: Marketing, Business & Communication Sonaria Global Sonaria Global Service Group 2: Global & Standards Guality & Standards Sonaria Global Sonaria Global Service Group 4: Marketing, Business & Communication Guality & Standards Sonaria Global Sonaria Global Service Group 6: Country Node Sonaria Global Sonaria Global Sonaria Global Sonaria Global Sonaria Sonaria Global Sona	Central Hub		Scenario Mediun	<u>n</u>	
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Service Group 2: Liefrastructure & Data Management & Evifrastructure & Data Management & Senaralo & Gibbal & Gi	Service Group 1: Science & Engineering Research	Science & Engineering Research	Scenario Global		
Service Group 2: Liefrastructure & Data Management E-iefrastructure & Data Management Service Group 2: Lier Selection Dier Selection Dier Selection Service Group 4: Marketing, Business & Communication Marketing, Business & Communication Service Group 5: Quality & Standards Service Group 6: Service Group 7: Service Grou					
Service Group 2: Lest Selection Lest Management E infrastructure & Data Management Service Group 2: Lest Selection Service Group 4: Marketing, Business & Communication Marketing, Business & Communication Service Group 5: Quality & Standards Service Group 5: Quality & Standards Service Group 6: Service Group 7: Marketing, Business & Communication Service Group 7: Marketing, Business & Communication Service Group 7: Marketing, Business & Communication Service Group 7: Quality & Standards Service Group 7: Quality 8: Quality					
Service Group 1: User Selection User Selection Scenario Global Service Group 4: Marketing, Busines & Communication Scenario Global Service Group 5: Quality & Standards Scenario Global Service Group 5: Quality & Standards Scenario Global	Service Group 2: E-infrastructure & Data Management	E-Infrastructure & Data Management	Scenario Global		
Service Group 4: Marketing, Business & Communication Marketing, Business & Communication Senario Global Service Group 4: Marketing, Business & Communication Senario Global Service Group 5: Quality & Standards Senario Global Service Group 6: Senario Global Country Node Senario Global					
Service Group & Marketing, Busines & Communication Senario Global Service Group & Marketing, Busines & Communication Senario Global Service Group 6: Senario Global Country Node Senario Global	Service Group 3: User Selection	User Selection	Scenario Global		
Service Group 5: Quality & Standards Guality & Standards Sconario Global Service Group 5: Quality & Standards Guality & Standards Sconario Global Country Node Sconario Global Country Node Sconario Global					
Service Group 4: Marketing, Busines & Communication Merketing, Business & Communication Sociality & Standards Good Sociality & Standards & Sociality & Sociality & Standards & Sociality & Sociality & Standards & Sociality &					
Service Group 5: Quality & Standards Ooslity & Standards Oobla Service Group 6: Sonauto Oobla Country Node Sonauto Oobla	Service Group 4: Marketing, Business & Communication	Marketing, Business & Communication	Scenario Global		
Service Group 6: Quality & Standards Global Service Group 6: Senario Global					
Service Group 6: Scenario Global Country Node Scenario Global	Service Group 5: Quality & Standards	Quality & Standards	Scenario Global		
Service Group 6: Gobal Country Node Scenario Gibbal					
Senarlo Gobal Country Node Scenarlo Global					
Country Node Scenario Global	Service Group 6:		Scenario Global		
Country Wode Scenario Global					
	Country Node		Scenario Global		

Figure 7 'Operational Cost' tab



The operating costs related to the central hub (*Figure* 9) are divided into administrative costs and staff costs. In both sections, the following fields exist:

- %/FTE: percentage or full-time equivalent. This value is only used if the scenario is set to None/Custom; otherwise, it is not used.
- Base Costs: This is the annual base cost for the item.
- €/annum: This is a calculated field, that accounts for the %/FTE.
- €/month: Similar to the previous field, but with a monthly resolution.

The user only needs to specify the *Base Costs*, and in the case of a None/Custom scenario the *%/FTE*.

The assumptions for each scenario are present on a box to the side of the inputs and can be changed by the user.



laringra i financial model			
Parinition of Operating costs, Different scenarios an	a nossible lean medium full and custom For custom scenario % of base costs and	Global Scenario	
FTE must be filled in	possible, lean, medium, run, and custom. For custom scenario, is of base costs and	Scenario Inputs	
Parameter		Section of Inputs	
Central Hub		Scenario Medium	
Costs inputable to	MARINERG-I DRI	Full Medium Lean	
Admnistrative Costs	% Base Costs €/annum €/month	% % %	
Office space	1 12.000 € 12.000 € 1.000 €	100% 100% 50% 1	
Utilities	1 1.800 € 1.800 € 150 € 15% of rent	100% 100% 100% 1	
Insurance	1 1.500 € 1.500 € 125 €	100% 100% 100% 1	
Consumables	1 3.500 € 2.450 € 204 €	100% 70% 30% 0,7	
Professional fees (Accountants, Lawyers, IT, etc)	1 7.000 € 7.000 € 583 €	100% 100% 50% 1	
Marketing and Outreach	1 5.000 € 3.500 € 292 €	100% 70% 20% 0,7	
Meetings (travel)	1 25.000 € 15.000 € 1.250 €	100% 60% 20% 0,6	
Contingency	4.325 € 360 € Assumed 10% contingency		
Total	47.575 € 3.965 €		
Staff	FTE Base Salary €/annum €/month	FTE FTE FTE	
Managing Director	1 120.000 € 72.000 € 6.000 €	1 0.6 0.4 0.6	
Links Coordinator	Z 60.000 € 30.000 € 2.500 €	1 0.5 1 0.5	
Project Manager	1 90.000 € 54.000 € 4.500 €	1 0.6 0 0.6	
Finance Officer	1 80.000 € 32.000 € 2.667 €	1 0,4 0 0,4	
	0 € 0 €	0	
	0 € 0 €		
Total	188.000 € 15.667 €		
Total	235.575 C 19.631 C		
Service Group 1: Science & Engineering Research	Science & Engineering Research	Scenario Global	
Service Group 2: E-infrastructure & Data Management	E-infrastructure & Data Management	Scenario Global	
Service Group 3: User Selection	User Selection	Scenario Global	
Service Group 4: Marketing Business & Communication	Marketing Buriness & Communication	Scenario	
service Group 4, marketing, business & communication	marketing, business & communication	Jenano Giovan	
Service Group 5: Quality & Standards	Quality & Standards	scenario Global	
service Group 6:		Scenario Giobai	

Figure 9 Central hub operating costs

For the service groups (*Figure 10*), the rationale is the same as for the central hub, but there is also a subsection for activities-related costs.



Figure 10 Service group operating costs

Finally, for the country nodes (*Figure* 11), the cost breakdown and rationale are the same as for the central hub.



Iarinerg-i financial model			
Definition of Operating costs. Different scenarios are	e possible: lean, medium, full, and custom. For custom scenario, % of base costs and	Global Scenario Lean	
FTE must be filled in		Scenario Inputs	
Service Group 2: E-infrastructure & Data Management	E-infrastructure & Data Management	Scenario Global	
Service Group 3: User Selection	User Selection	Scenario Global	
Service Group 4: Marketing, Business & Communication	Marketing, Business & Communication	Scenario Global	
Service Group 5: Quality & Standards	Quality & Standards	Scenario Global	
Sector Security		formula field	
Service Group 6:		Scenario Giobai	
Country Node		Scenario Global	
Costs inputable to	Country Node	Scenario Innuts	
costs inputation to		Full Medium Lean	
Admnistrative Costs	% Base Costs €/annum €/month	% % %	
Office space	0,3 6,000 € 0 € 0 € 0,3 900 € 0 € 0 € 15% of rent	100% 50% 0% 0	
Insurance	0,3 600 € 30 € 3 €	100% 50% 5% 0,05	
Consumables	0.5 1.500 € 375 € 31 €	100% 50% 25% 0,25	
Contingency	41€ 3€ Assumed 10% contingency		
Total	445,5 37€		
a. 17	ere and alarma alarma	an an an	
Administrator	1/2 Base salary ≪annum ≪/montn 0.3 35.000 € 8.750 € 729 €	0.5 0.5 0.25 0.25	
Tech Coordinator	0,3 35.000 € 0 € 0 €	1 0,5 0	
Secretary	0,5 25.000 € 12.500 € 1.042 €	0,5 0,5 0,5	
Total	21.250 € 1.771 €		
Total	21.696 € 1.808 €		
Intro Setup Timeline Implementation Costs	Operational Cost Revenues Balance Sheet Sensitivity Data 🔶		

Figure 11 Country node operating costs

3.6. Revenues

The revenues tab is split into the following sources of revenue:

- Membership fees
- Access fees
- Revenues from other services
- Other revenues and funding

While the revenue generation and philosophy are detailed in the business model, in order to analyse the financial viability and sustainability of the DRI, it is necessary to include them in the model.

The membership fees section (*Figure* 12) presents a more complex calculation of fees than what was used in the business model, in order to allow for more flexibility in the scenarios being explored.

The formula used in the financial model is:

The different premiums can be set to zero in order to not consider them. The fee for the host member is treated as a premium over the base fee, while in the business model it is considered as a separate value. For the purposes of the model, the corresponding premium is the difference between both fees.



			🕀
	Marinerg-i financial mo	iodel	
	Definiton of revenues: members	rship fees, access fees, other services, other revenues/funding	
	Membership fees		
[·]			
	Formula (Base Fee + Parti	icipation Mode modifier = Entity Type modifier)+Host fee+Service Group Host fee+Regional Lead Fee+(Infrastructure Fee+N. Infrastructure)+(Access Units fee+N. Access Units)	
		Suggested Values (Based on operational costs)	
	Parameter Base Fees	Value % of op. costs coverd by fees 60% Costs included Operational Control over dby fees 153,200 c	
	Base Fee	10000 €/annum Central Hub Administrative Yes	
	Host Premium Eee	Staff Yes %forcests Value	
	noscriennum rec	Administrative Ves Host Premium Fee 35% 51.645 c	
	Service Group Premium Fee	Staff No Service Group Premium Fee 0% 0€	
	Regional Lead Premium Fee	S000 ¢/annum Staff No regional Lead Premium Pee 00 00	
	Information and Assessments from		
	Infistructure and Access units fees	s into tooican be used to assess the best values go in memodening press, based on what costs should be covered by mose, and the breakdown of base fee and premiums for host	
	Infrastructure	0 ¢/infrastructure.annum	
	Units of Access	0 ¢/annum	
	Modifiers		
	Participation Mode Participating Member	100% 56	
	Observer Member	50% %	
	Entity Type		
	Member State	1.00% %	
	Associated Country Third country	100% % 10%	
	Intergovernmental organisation	n 10% %	
	Total	15000 F/ansum	
	1000		
	Total (long-term target)	310000 ¢/annum	
	Access fees		
	Parameter Business model	vaue comments Commission based	
	Utilization rate	50%	
	Intro Setup Timeline I	Implementation Costs Operational Cost Revenues Balance Sheet Sensitivity Data 🔶	

Figure 12 Membership fees inputs

In the 'Membership fees' subsection there is a box that can guide the user to choose the values for the different fees based on the operational costs (*Figure* 13). In this box the user selects which costs should be covered by the membership fees (1, in the figure), at which percentage (2, in the figure), and the breakdown among the different premiums (3, in the figure).

Suggested Values (Based on oper	rational	costs)				
			% of op. costs coverd by fees	2	60%	
Costs included		1	Operational Costs covered by fe	es	153.270€	
Central Hub Administrative	Yes					
Staff	Yes		3	% of costs	Value	
Service Group Activities Related	Yes		Base Fee	65%	10.487€	
Administrative	Yes		Host Premium Fee	35%	53.645€	
Staff	No		Service Group Premium Fee	0%	0€	
Country Node Administrative	No		Regional Lead Premium Fee	0%	0€	
Staff	No			100%		
This tool can be used to assess the be	st value	s for mem	bership fees, based on what cost	s should be co	overed by t	hose,
and the breakdown of base fee and p	oremiun	ns for host				

Figure 13 Membership fees guidance tool

For the 'Access fees' inputs (*Figure* 14), the tool considers two methods proposed in the draft business plan: commission based, and levy based. The commission-based revenue uses a commission percentage and the average cost per unit. For the levy-based approach, a fixed levy is used.

A utilization rate can also be defined in order to assess the risks of the DRI underperforming in terms of securing clients.



larinerg-i financial m	odel	
Definiton of revenues: membe	hip fees, access fees, other services, other revenues/funding	
Membership fees		
Access fees		
Parameter	Value Comments	
Business model	Commission based	
Utilization rate	90%	
Commission Based		
Commision value	15%	
Average cost per unit	20000 C/week	
Levy Based		
Levy Value	1/30 ¢/weex	
Business Model comparison		
Number of units of access	120 week	
Commission Revenue	324000 €/annum	
Levy Revenue	189000 ¢/annum	
Total	324000 €/annum	
Total (long-term target)	45000 F/annum	
rotar frong term target)	4 de la companya de la compa	
Other Services		
Other Revenues		

Figure 14 'Access fees' inputs

The 'Other Services' subsection (*Figure* **15**) provides guidance on other services that the DRI may offer and commercialise, such as the ones identified in D6.3 [6]. As access is intended as the core business, these other activities are unlikely to provide a significant revenue contribution. Three different services have been included: training, data access, and certification. These can have different pricing policies for members and non-members.

Aarinerg-i financial model	
Definiton of revenues: membership fees, access fees, other services, other revenues/funding	
Membership fees	
xcess fees	
nther Services	
Parameter Value Comments	
Short course per year 2	
Avg. number of participants per col 25	
Open to non-members Yes	
Target percentage of non-member 40%	
Pricing	
Members 0 C/participant Non-members 200 C/participant	
Table com d'annue	
Data Access	
Liversing indue: Alling incluses	
Open to non-members Yes	
Target percentage of non-member 60%	
Pricing	
Members 0 C/License Non-members 50 C/License	
Total 1500 (Cannum	
Other services (ex.Certification)	
larget clients per year a	
Pricing 5000 ¢/service	
Total 15000 ¢/annum	
Other Revenues	
Intro Setup Timeline Implementation Costs Operational Cost Revenues Balance Sheet Sensitivity Data 🕣	()

Figure 15 'Other Services' inputs

The final subsection on the Revenues tab relates to 'Other revenues' (*Figure* 16), including third party grants and sponsoring.



A table for the implementation phase grants is also included in this section, with the dates connected to the timeline tab.

rinora i financial a	aadal	
Definiton of revenues: member	In Carlos International Intern	
embership fees		
cess fees		
her Services		
ther Revenues		
ird Party Grants	0 ¢/annum	
onsoring	0 ¢/annum	
her	0 ¢/annum	
plementation Phase Grants		
Grad Start INFLADCY 3 1 3225 INFLADCY 3 1 3226	End Total Amount Per annum 12 3243 0000004 1.000.004 <th></th>	
lintro, I Seturi, Timeline	Inclementation Cotts. Operational Cott Revenues Balance Sheet Sensibility Opta @	1 1

Figure 16 'Other revenues' inputs

3.7. Balance Sheet

The balance sheet tab provides a summary of the previous tabs and aggregates the results to produce a financial analysis. It presents the summary for implementation and operating costs, and for revenues.

Figure **17** shows the operating costs summary based on the current selection of scenarios, as well as the total costs for all scenarios.



Marinerg-i financial model			
Implementation Cost			
Operating Costs			
Central Hub Admnistrative Costs Staff	Current €/annum €/month 47.575 € 3.965 € 188.000 € 15.667 €	Full Medium Lean None/Custom	Costs (Long Term)
Total	235.575 € 19.631 €	411.380 € 235.575 € 129.835 € 411.380 €	Mantrolog, Business & Communication 7% Standards 9%
Service Group 1. Science & Engineering Research 2. E-Infrastructure & Data Management 3. User Selection 4. Marketing, Business & Communication 5. Quality & Standards	€/annum €/month 31.667 € 2.653 € 33.417 € 2.785 € 8.733 € 728 € 21.108 € 1.755 € 2.288 €	Full Medium Lean None/Custom 91.800 € 55.163 € 31.607 € 0 € 84.400 € 55.163 € 33.407 € 0 € 27.650 € 17.500 € 8.733 € 0 € 51.700 € 44.625 € 21.100 € 0 € 62.500 € 42.25 € 27.455 € 0 €	User Selection E untersurgerung A
6 0 Total	0€ 0€ 122.376€ 10.198€	0 € 0 € 0 € 0 € 319.900 € 205.675 € 122.376 € 0 €	Management 13 Central Hull Science & Expressing Research
Country Node Total	€/annum €/month 0 € 0 €	Full Medium Lean None/Custom 0 € 0 € 0 € 0 €	
Total Operating Costs	€/annum €/month 357.951€ 29.829€	Full Medium Lean None/Custom 731.280 € 441.250 € 252.211 € 411.380 €	
Revenue			
Cashflow			
Country and RIs balances			
Intro Setup Timeline Implementation Costs	Operational Cost Revenues Balance She	eet Sensitivity Data (+)	

Figure 17 Operating costs summary

Likewise, the revenues summary (*Figure* **18**) shows the revenues based on the current makeup of the DRI as well as the long-term target revenues.

					Ŧ
	Marinerg-i financial model				
	MARINERG-I DRI Balance Sheet				
					_
_	Implementation Cost				
+					
	Operating Costs				
+	openanticente				-
	Revenue				
i i	an and a star from	Current	Long Term	Revenues (Long Term)	
	Access Fees	105 000 €/annum	453 600 C/annum	Revenues (LONG TETTI)	
	Other Services	22 520 €/annum	22 520 €/annum	Other Services	
I r ·	Training	6020 €/annum	6020 €/annum		
	Data Access	1 500 €/annum	1 500 €/annum		
	Other services (ex.Certification)	15 000 €/annum	15 000 €/annum	Access Rees	
	Third Party Grants	0 €/annum	0 €/annum	58%	
1.1	Sponsoring	0 €/annum	0 €/annum		
	Other	0 €/annum	0 €/annum	Membership Fees	
1日.	Total Bauanuar	535 530 <i>c</i> /annum	795 130 6/2000		
	Total Revenues	511 520 ty annum	766 120 Q annum		
1.0	Operational Balance	153 570 €/annum	54 840 €/annum		
-					
	Cashflow				-
•					
	Country and RIs balances				
+					
	Intro Setup Timeline Implementation Cos	ts Operational Cost Revenues Balance St	seet Sensitivity Data 🛞		Þ

Figure 18 Revenues summary

The cashflow analysis includes options that require user input (*Figure* 19).

To update values for inflation, the user needs to specify the average annual inflation rate, and the reference year of all the values in the model.



In relation to the implementation phase, the user can specify the number of years over which the implementation costs will be spread, and whether funding is available from INFRADEV-2 towards the implementation costs, and therefore, match the timeline to that of INFRADEV-2.

Both the current and long-term revenues are analysed, based on the inputs supplied in the Setup tab. The table of the inputs to the Business Model [4] aims to fully capture the first years of operation.

Furthermore, the table of the Ramp-up of operating costs (see *Figure* **19**) enables flexibility in the modelling of the costs in first years of operation and allows the user to simulate a staggered creation of the different service groups. In this table, for the first 6 years of operation, the user can specify the scenario of operation (lean, medium, full, none/custom) for the central hub, each of the service groups and for the country nodes.



Figure 19 Cash flow options

Connected to the inputs in the timeline tab, a timeline for the different processes associated with establishing the MARINERG-i DRI is presented in the 'Balance Sheet' tab in order to illustrate the different stages (*Figure* 20).





	1,50%										
	3 years										
in cost	Yes										
term revenues	No										
2017 2018	2019 2020	2021 2022	2023	2024 2025	2026	2027 2028	2029 20	30 2031	2032 2033	2034	2035 2036
		1									
		v									
					1						
					1						
					_						
1											
	eet	eet	eet	eet	eet	eet	eet	eet	eet 1.50% 2003 2003 2003 2003 2003 2003 2003 2004 2012 2018 2019 2019 2019 2019 2019 2020 2021 2022 2024 2025 2025 2025 2025 2027 2028 2029 2019 2019 2019 2019 2019 2019 2019 2019 2019 2010 2010 2011 2010 2010 2011 2010 2010 2010 2011 2010 2010 2010 2011 2010	eet 1.50% 2005 200 200	eet

Figure 20 Timeline visualization

The cash flow analysis is presented below the timeline, separated into Costs and Revenues for the different categories shown in *Figure* **21**. These can be expanded and collapsed as the user sees fit.

Ure INERADEV 3 for implormentation	cort		Ver																	
Use INFRAUEV-2 for Implementation	COSL		Yes																	
Use Business model values for long t	erm revenues		No																	
Business model Inputs																				
Ramp up of operating costs																				
Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
ESFRI					5															
ERIC																				
INFRADEV																				
MADINITIC																				
MARINERG-1																				
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Costs	0€	0€	0€	0€	129.835€	1.045.678 €	1.061.364€	1.077.284€	129.835 €	487.653€	348.526 €	298.400 €	466.516 €	760.578 €	806.944 €	887.447€	900.758€	914.270 €	927.984€	0
Implementation costs	0€	0€	0€	0€	0€	1.045.678 €	1.061.364 €	1.077.284 €	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0
Central Hub	0.6	06	06	30	129.835€	06	30	06	129.835€	487.003€	348.520 €	298.400 €	400.510 € 273 394 €	700.578 €	800.944 € 491.853.€	887.447€ 499.231.€	506 720 €	514.270€	927.984 € 522.035.€	0
Service Groups	06	06	06	06	00	06	06	06	0€	96.367€	83.153 €	149.948 €	193,122 €	275.993 €	315.090 €	388.215€	394.039€	399,949 €	405.948 €	0
Science & Engineering Re	0€	0€	0€	0€	0€	0€	0€	0€	0€	35.145 €	35.672€	36.207€	36.750 €	64.979 €	65.953 €	111.404 €	113.075 €	114.771€	116.493€	0
E-infrastructure & Data N	0€	0€	0€	0€	0€	0€	0€	0€	0€	61.222€	37.643€	38.208€	64.018€	64.979€	100.910€	102.424 €	103.960 €	105.520 €	107.102€	0
User Selection	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	9.837€	20.009 €	20.309 €	31.864 €	32.341 €	32.827€	33.319€	33.819€	34.326€	0
Marketing, Business & Co	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	24.134€	40.184 €	63.256 €	64.205 €	65.168€	66.145€	67.137€	68.145€	0
Quality & Standards	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	31.389€	31.860 €	50.917€	51.681 €	76.393 €	77.539€	78.702€	79.883€	0
0	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0
Country Node	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0
Revenues	0€	0€	0€	0€	0€	1.045.678€	1.061.364€	1.077.284€	0€	1.434.497€	1.549.513€	579.150 €	894.220 €	926.009 €	939.899€	953.998€	968.308 €	982.832€	997.575€	0
Grants	0€	0€	0€	0€	0€	1.045.678 €	1.061.364 €	1.077.284 €	0€	1.109.845€	1.126.493 €	0€	0€	0€	0€	0€	0€	0€	0€	0
Implementation Grants	0€	0€	0€	0€	0€	1.045.678 €	1.061.364€	1.077.284 €	0€	1.109.845 €	1.126.493 €	0€	0€	0€	0€	0€	0€	0€	0€	0
Third Party Grants	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0
Membership Fees	0€	0€	0€	0€	0€	0€	0€	0€	0€	299.658€	255.714 €	244.685 €	283.172 €	365.164 €	370.642 €	376.201€	381.844 €	387.572€	393.386 €	0
Access Fees	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	141.938€	308.715€	584.913€	534.318€	542.332€	550.467€	558.724€	567.105€	575.612€	0
Other Services	0€	0€	0€	0€	0€	0€	0€	0€	0€	24.994€	25.369€	25.749 €	26.135 €	26.527€	26.925 €	27.329€	27.739€	28.155€	28.578€	0
Sponsoring	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0
Other	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0€	0
Operational Balance	0€	0€	0€	0€	-129.835€	0€	0€	0€	-129.835€	946.843€	1.200.987€	280.750 €	427.704 €	165.431 €	132.956 €	66.551€	67.549€	68.563€	69.591€	0
Balance	0€	0€	0€	0€	-129.835€	-129.835 €	-129.835€	-129.835€	-259.670€	687.173€	1.888.160 €	2.168.911 €	2.596.615 €	2.762.046 €	2.895.001 €	2.961.553€	3.029.102 €	3.097.665 €	3.167.256 €	.167.256

Figure 21 Cashflow

Visualisations of the cashflow are provided in the form of a balance over time chart and a comparison between costs and revenues by category (*Figure 22*).

🧹 marinerg-i



Figure 22 Cashflow charts

The final section of the balance sheet tab examines the costs that are inputable to the countries (*Figure 23*), with the option for the country to then pass on the costs to the different RIs. This helps illustrate the added burden to each country or RI, and can be later compared to the benefits that come from participating in MARINERG-i.



Figure 23 Country and RIs balances



3.8. Sensitivity Analysis

Sensitivity analysis of key inputs is presented in the 'Sensitivity' tab (Figure 24).

The sensitivity analysis can be univariate or bivariate and looks at changes to the operational balance resulting from changes to the inputs. The user can change the inputs range in order to analyse different options. The operational balance affected by this analysis is based on the DRI configuration defined in the setup table, considering the operational costs and revenues. It is not the long-term operational balance.

The sensitivity/variation of operational balance is based on:

- Number of participating members
- Number of participating members and number of observing members
- Number of service groups⁴
- Number of infrastructures and number of units of access
- Base Fee and Host Premium
- Utilisation rate
- Commission rate
- Levy values

Number of participating	bers, and modes of participation	
Balance vs. Participatin	mbers	
	Number of participating members	
	3 5 7 9 15	
Operational Balance	162.130 € 182.130 € 202.130 € 222.130 € 222.130 € 222.130 €	
Operational Costs	309.391 € 309.391 € 309.391 € 309.391 € 309.391 €	
Current number of partic	ng members 7	
Participating vs. Observ		
	Number of naticinating members	
Operational Balan	3 5 7 9 15	
×	137,130€ 157,130€ 177,130€ 197,130€ 257,130€	
per per	147.130 € 167.130 € 187.130 € 207.130 € 267.130 €	
the second se	120/1304 17/1504 19/15/1504 21/1504 27/1304 15/1306 19/1504 19/1306 29/1306 22/1306	
2	177.130 ¢ 197.130 ¢ 217.130 ¢ 237.130 ¢ 297.130 ¢	
Current number of partic	ng members 7	
Current number of obser	sembers 5	
Service Groups	Number of conice around	
Operational Balance	260.945 € 205.862 € 202.130 € 163.570 € 168.570 €	
Revenues	496.520 € 506.520 € 511.520 € 521.520 € 526.520 €	
Operational Costs	2352734 580,6584 503,3314 357,5514 357,5514	
Current number of service	ups 3	
Infrastructures and units	cess	
	Number of infrastructures	
Operational Balan	4 8 16 20 36	
2	13.130 € 13.130 € 13.130 € 13.130 € 13.130 €	

Figure 24 'Sensitivity' tab

⁴ This is a simplistic approach and simply adjusts the membership revenue, and adds/removes the operating costs in the presented order to match the selected number. An in-depth analysis should match the detailed operational costs to the number of service groups defined on the Setup.





3.9. Data

The final tab includes the data used for the dropdown lists (*Figure* **25**). This tab is merely informative; however, the user can change the values if necessary.

inerg-i financi	al model	
Data		
The lists for the different dro	p-down options are presented in this tab, with descriptions and/or definitions if relevant	
les of participation		
Mode	* Description	
	The Consortium Members have provisionally agreed to the following list of duties of the Members:	
	4.1.2.1 participate in the activities of the MARINERG-I ERIC;	
	4.1.2.2 participate in the Assembly of Members meetings with the right to vote;	
Participating Member	4.1.2.3 elect and be elected for the bodies of the MARINERG-I ERIC through their representatives;	
	4.1.2.4 propose the admission of new Members or Observers who will be subject to the approval of the Assembly of Members;	
	4.1.2.5 examine the account, documents and books concerning the activities of the MARINERG-I ERIC;	
	4.1.2.0 request and obtain information on the activities of the MANINERG-LERIC; and 4.1.2.7 withdraw from the MANINERG LERIC in accordance with the withdrawal servicines of the Statute	
	Observers have the right to attend and participate in the Assembly of Membrane's meeting and in other bodies of the FRIC, but do not	
Jbserver Member	have voting rights	
of Access		
Init	w .	
зу		
zek		
aanth		
ionu -		
s of entities	* Description *	
s of entities	Description (Description Member States of the European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France,	
s of entities ype	Description Description Member States of the European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Netland, Tahy, Lutvia, Uthuania, Luzembourg, Malta, Netherlands, Polind, Portugal, Romania, Slovaka,	
s of entities ype lember State	Description Other States of the European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hongary, Ireland, Irahy, Liviu, Uthunia, Luxembourg, Marta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovak	
of entities ppe ember State	Description Description Description Member States of the European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Green, Hogany, Heland, Tahy, Lutvia, Luturaia, Lusembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom 1 ⁴ Associated Courty means a courty which is: (1) not a Member State of the European Union; and (ii) a party to an international	
s of entities ype	Description Member States of the European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Caech Republic, Denmark, Estona, Finland, France, Germany, Greece, Hongary, Ireland, Italy, Lativia, Lithumaia, Latenboorg, Matta, Netherlands, Poland, Portugal, Romania, Stovaka, Stovania, Syain, Sweden, United Kingdom [1] Associated Country means a country which is: [1] for a Member State of the European Union; and [ii] a party to an international Agreement with the Luropean Commission and makes a Financial contribution is all or part of the European Commission's research,	
s of entities ype tember State	Description Description Description Member States of the European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Crease, Hungary, Heland, Tahy, Lutvia, Lutumaia, Luzembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Swedlen, United Kingdom 1 ¹ Associated Courty means a courty which is: [1] on a Member State of the European Union; and (1) a party to an international Agreement with the European Commission and markes a Transcal contribution to all or part of the European Commission's networks, the former technological development and demonstration programmes: leaded, Norway, Swettendia, Alamaia, Sonia and Intergroups, the former	
of entities pe ember State sociated Country	Description Descripti Descripti Description Description Description	
i of entities rpe ember State sociated Country ind country indexemption consistent	Description Member States of the European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germann, Green, Hogany, Neblend, Tahy, Lutvia, Lutunaia, Lusembourg, Matta, Netherlands, Polind, Portugal, Romania, Slovakia, Slovenia, Spain, Sveeden, United Kingdom 1 ⁴ Associated Courty means a country which is: [1] not a Member State of the European Union; and (ii) a party to an international Agreement with the European Commission and markes a financial contribution to all or part of the European Commission's research, technological development and devices technol. Series (Latvier, Issael, Moldovia, Faree Island, Ustanie, Tunnia, Georgia and Armenna. The documents of the Than Associated Countries	
ember State isociated Country irrd country tergovernmental organisa	Description One-control of the European Union: Austria, Belgium, Bulgaria, Chatla, Cypnus, Clech Republic, Denmark, Estonia, Finland, Faroca, Gereman, Yosen, Hungar, Noteka, Luthuati, Luthua, Songari, Songari, Poland, Portugal, Romania, Slovika, Songari, Saveden, United Kingdom 11 Accounted Control means a count which I: (1) of a Mamber State of the European Lution; and (1) a party to an International Agreement with the European Commission and Marcingma, the former Vagolar Republic of Macedonia, Montenegro, Serbia, Turkey, Iozael, Moldovia, Faroe Islands, Ukraine, Tuntsia, Georgia and Ammenia. Third Countries other Han Associated Countries	
of entities ppe ember State ssociated Country irrd country tergovernmental organisa	Description Description Description Member States of the European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greene, Huggary, Helind, Tahy, Lutvia, Lutunai, Lusembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenka, Spain, Sveden, United Kingdom 1 ¹ Associated County means a country which is: [1] on a Member State of the European Union; and (ii) a party to an international Agreement with the European Commission and markes a financial contribution to all or part of the European Commission's research, technological development and devices Eckedin, Norway, Swettendin, Albania, Sonia and Intergroups, the Former tryglical Republic of Macdonia, Nontenego, Serbia, Turkey, Isteel, Moldovia, Faree Islandi, Ustanin, Tunnas, Georgia and Armemia. Third countries other than Associated Countries	
s of entities ppe tember State ssociated Country nird country tergovernmental organisa mapping	Description (* Description (* Description (*) Description (*) Description (*) Description (*) Description (*)	
of entities ppe ember State soccated Country ind country tergovernmental organis: mapping tity group	Description Descripti Descripti Description Description Description	
s of entities	Description (v Description (
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Figure 25 'Data' tab



4. Analysis

4.1. Implementation phase

The implementation phase starts with the inclusion of MARINERG-i in the ESFRI roadmap. During this phase, a legal entity will need to be established as well as the required contracts between participants. These have associated costs related to human resources and services.

The inclusion on the ESFRI roadmap also gives access to other sources of funding (i.e. INFRADEV-2), which can be used to establish the ERIC and upgrade the participating RIs to the MARINERG-i standard. *Figure* 26 below presents the ESFRI/ERIC timeline for MARINERG-i, identifying sources of funding.

2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 01 02 03 04 01 02 0 MARIN ERG-I MAREI Managing and Ireland unding Submission to ESRFI road map **EFSRI** Road ma INFRA DEV 2 supported Marinerg-i Submit ERIC Business model activ INFRA DEV 3 supported ERIC STATUS Limited Pilot of Country funding income Commission based income from testing commences MARINET 2 MARINET 3 Funding Funding

Marinerg-i ESFRI- ERIC Timeline

Figure 26 MARINERG-i ESFRI operational plan towards sustainability, from D8.2 [4]

During the implementation phase, the costs associated with the central hub will follow the lean scenario. The INFRADEV support will cover operational costs, costs associated with the ERIC formation and upgrades to infrastructures.

4.2. Operational phase

Once the ERIC is established, MARINERG-i will be a legal entity and the operational phase will begin. As detailed in the business plan [4], the initial operational period will be supported by investment funding from grant support mechanisms available for initiating ESFRI formation initiatives, as no revenue generating activities will be occurring. A lean operation will be adopted, with low overheads and operational costs. The contributions from members (in-kind or cash) will be maximized in order to establish the MARINERG-i DRI quickly and enable it to become business operational at the earliest opportunity.

The individual contributions from members are envisaged to decrease as the number of members increase. The business models of other ESFRI projects typically use the running costs of the DRI as a measure for the membership fees and divide them among the participating members. The weights given to each member contribution varies from project



to project, varying from a simple fixed fee to more complex fee structures based on population, GDP and/or number of participating infrastructures (*Table 1*). For simplicity, and based on the similarity of operation, a similar business model to that of the EMSO and ECCSEL ERICs was adopted for MARINERG-i.

		BBMRI	EMBRC	AnaEE	EMSO	CLARIN	SHARE	MIRRI	ECCSEL
		[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
Fixed Fee					х				х
Variable Fee	Other								
	Based on population								
	Based on GDP					х		х	
	Based on infrastructures								
Fixed Base Fee			x	x			х		
Variable Base Fee	Other								
	Based on population	x	x						
	Based on GDP		x	x					
	Based on infrastructures			x					
Fixed add-on fee									
Variable add-on fee	Other						х		
	Based on population								
	Based on GDP	х							
	Based on infrastructures								
Premium for Host			х	х	х	х	х		х
Different for		v				v			
organizations		^				^			
Different for observers		х			х	х			
Cap on maximum		x				x			х
Cap on minimum						x			

Table 1 Membership fees components for different DRI ESFRI projects

Assuming that no major changes to the operation of the ERIC are required (i.e. no changes to operational costs), any increase in membership will increase revenues and the operational balance (



Table 2). This increase in the balance can be used to invest in the infrastructures, or reduce the contributions of the members.



 Table 2 Sensitivity of Operational Balance to number of participating members, considering only

 the central hub

	Number of participating members								
	3	5	7	9	15				
Operational Balance	-13.860€	6.140€	26.140€	46.140€	106.140€				
Revenues	397.520€	417.520€	437.520€	457.520€	517.520€				
Operational Costs	411.380€	411.380€	411.380€	411.380€	411.380€				

The scope of services offered by the MARINERG-i ERIC in the early years will be limited, with the focus on the core business of access to RIs, but with a limited number of units of access. The number of access units and the number of participating infrastructures will be increased during the first few years, and other services will be added to the portfolio of the DRI.

Reduced numbers of access units and participating members will result in low revenues from access fees, and the need to increase the membership fees in order to cover the running costs.

At first, these services will be coordinated from the central hub, but as the DRI grows, the management of these services may be passed on to the different services groups. This will represent added costs to the DRI but will ultimately allow for a more dedicated service.

The different scenarios of operation (lean, medium, full) allow for a certain control of operational expenses. The lean scenario minimizes the overheads, and focuses on secondments of personnel of participating infrastructures in order secure the required human resources [4]. The following figures show the operational costs for the different scenarios of operation for the central hub (*Figure* 27) and the service groups (*Figure* 28).



Comparision of scenarios (central hub)

Figure 27 Comparison of scenarios of operation for the central hub





Comparision of scenarios (service groups)



Figure 28 Comparison of scenarios of operation for the service groups

Throughout the operation of the DRI, one source of risk is the utilization rate of the RIs committed to MARINERG-i. Especially during the initial years, as the MARINERG-i brand is being created, there is the risk that not all units of access will be taken up by clients. The MARINET and MARINET2 projects have shown that there is a market for this type of initiative. However, even with trans-national access support, not all infrastructures achieved a 100% utilisation rate.

For the long-term scenario, the impact of different utilisation rates is show in *Table 3* and *Figure 29* below. The break-even utilisation rate is approximately 70%.



Table 3 Sensitivity of utilisation rate



However, once the DRI is in full operation, utilisation statistics will be available and the business model can be adapted to match the running costs, by changing the commission rate/levy or adjusting the member contributions.

In the long-term, in order to assure sustainability, the firm revenues (membership fees) should be set to fully account for fixed costs. However, considering the typical cost of





access to marine energy testing facilities and the chosen business model, the majority of the revenues will come from the access fees (*Figure* 30).



Figure 30 Long-term cost vs. revenue



5. Conclusions

The model allows the user to analyse different scenarios of operation of the MARINERG-i DRI and can be used to examine the different phases of the DRI implementation.

The tool can also be used identify the main areas of risk for the long-term sustainability of the MARINERG-i DRI.

During the preparatory and implementation phases when no legal entity is established and no revenues are being generated, the operational costs will need to be covered by other sources of funding. The INFRADEV-2 program can provide such support, and Ireland has committed to provide management and funding during the preparation of the application to ESFRI.

During the operation of the DRI, the number of participating members will affect the revenues. However, the number of members will be known, and the management of the central hub and the service groups can be adapted in order to match the costs to the incoming revenue.

The number of units of access will also affect the revenue; however, like the number of members, this will be set in the contracts between participants and the DRI, and the costs can be adjusted.

The highest source of risk during the operational phase will be the utilisation rate of the RIs on offer. However, the MaRINET and MaRINET2 programmes have shown that there is a demand for access to facilities, and the added-value provided by MARINERG-i will minimise the risk of not meeting the minimum utilisation rate needed for profitability.



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