

Project R-Mode Baltic

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Institute of Communications and Navigation

supported by

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German Federal Waterways and Shipping Administration



Wissen für Morgen

Status quo

R-Mode Feasibility study from ACCSEAS project

- *Possible solutions MF radio beacon (report 1)*
- *Detailed analysis MF radio beacon (report 2)*
- *Possible solutions AIS (report 3)*
- *Detailed analysis AIS (report 4)*
- *Detailed analysis of combination of MF, AIS and eLoran*

R-Mode Test-Bed from ACCSEAS in NL

- *Initial setup R-Mode modulator and R-Mode receiver*
- *First ranging measurements on short distance*
- *Identify mutual interference to legacy receiver*

Extended R-Mode Test-Bed in Germany (Helgoland)

- *Setup of one transmitter and 1-3 receivers to perform long distance measurements*
- *Perform sky wave measurements (ongoing)*

Project idea for ongoing R-Mode activities

Project Name → R-Mode Baltic

- *Self-explanatory project name*
- *no acronym; but comprehensive short description of main topic of project*
- *open for further projects (e.g. R-Mode Europe)*

Executive Summary

Since the introduction of GNSS (Global Navigation Satellite Systems) the maritime domain is participating on a new level of worldwide and accurate positioning and navigation. Over the last decade, the vulnerability of GNSS (both naturally occurring and manmade) is coming more and more into our consciousness and insofar the development of backup solutions is postulated. To address this matter such an alternative system shall be developed by the project R-Mode Baltic under the umbrella of the eNavigation strategy of IMO. The project is covering the aspects of developing a user-driven testbed in the Baltic Sea based on broadcasted signals via existing differential GNSS beacon stations as well as AIS base stations to increase maritime safety.

Key project activities

- *Setup an advanced test beds for R-Mode using MF transmissions from IALA radio beacons in the Baltic Sea*
 - *Development of a test bed concept for the Baltic Sea*
 - *R&D actions concerning the influence of sky wave and other environmental variations as well as of transmitter and receiver setup*
 - *Assessment of various R-Mode solutions*
 - *Equipment for reception of multiple MF-radio beacons with R-Mode functionality to perform real position tests*
 - *Development of a solution for time synchronization independently from GPS or find another way to solve the time problem*
 - *Development of an R-Mode receiver to perform position calculations*
- *Enlarge the test bed to include transmissions from AIS shore infrastructure and preparation of the R-Mode receiver for AIS functionality*
- *Test the combined solutions*
- *Perform connection to standardization processes by participation in dedicated committees and organizations as well as organization of workshops etc.*

The project shall address both R&D and implementation topics

Project outputs and results

- *eNavigation Testbed for alternative positioning based on Ranging Mode*
- *Prototype receiver for R-Mode functionality considering the aspects of a Multi-System Shipborne Radionavigation Receiver as well as the concept of onboard PNT-Unit*
- *Ensure connection to resilient PNT requirements of e-Navigation being active in working groups as IALA ENAV, IMO eNavigation, etc.*
- *Provide appropriate input to relevant recommendations on new and updated standards on MF IALA beacons and AIS in order to include R-Mode functionalities.*
- *Perform workshops to disseminate R-Mode results in IALA and advanced maritime forums.*
- *Open the door for usage at European and Worldwide level*

Leadership of the project

German Aerospace Center
Institute of Communications and Navigation



selected core competencies

- *Long term experience in navigation and communication*
- *Professional Project Management*
- *Channel Measurement and Modelling*
- *Resilient PNT*
- *Time synchronization*
- *Design of complete system concepts*
- *Operation of research infrastructures*
- *Contributions to standards*



DLR core team for R-Mode Baltic project

Dr. Simon Plass (Project Leader)

- *Certified Project Management Professional®*
- *Head of DLR Maritime Safety and Security Lab Oberpfaffenhofen*
- *Coordinator of different internal and external R&D projects*



Dr. Stefan Gewies (Technical Project Manager)

- *Group Leader “Maritime Services”*
- *Project Leader of several internal and external R&D projects*



Thoralf Noack (Deputy Project Leader)

- *Head of Department Nautical Systems*
- *Head of DLR research cluster Maritime safety and security Neustrelitz*
- *Spokesman of the Research Port Rostock*
- *Member of IALA PNT Working group*



Suitable Call for the project



Adobe Acrobat
Document

Dedicated
Programme manual

- Program:
- Call:
- Program priority:
- Program specific objective:
- Call opens:
- 1 stage proposal:
- Evaluation results of 1 stage:
- 2nd stage proposal:
- Evaluation results of 2nd stage:

Interreg Baltic Sea Region (IBSR)
Second Call for applications
3. Sustainable Transport
3.3. Maritime safety
announced for **01/03/2016**
concept note until **12/05/2016**
~ 09/2016
application form
05/2017 (!)

IBSR – Programme Area



covers eleven countries

- *Denmark: the whole country*
- *Estonia: the whole country*
- *Finland: the whole country*
- *Germany: the States of Berlin, Brandenburg, Bremen, Hamburg, Mecklenburg-Vorpommern, Schleswig-Holstein and Niedersachsen (only NUTS II area Lüneburg region)*
- *Latvia: the whole country*
- *Lithuania: the whole country*
- *Poland: the whole country*
- *Sweden: the whole country*

and three partner countries

- *Belarus: the whole country*
- *Norway: the whole country*
- *Russia: parts of it*

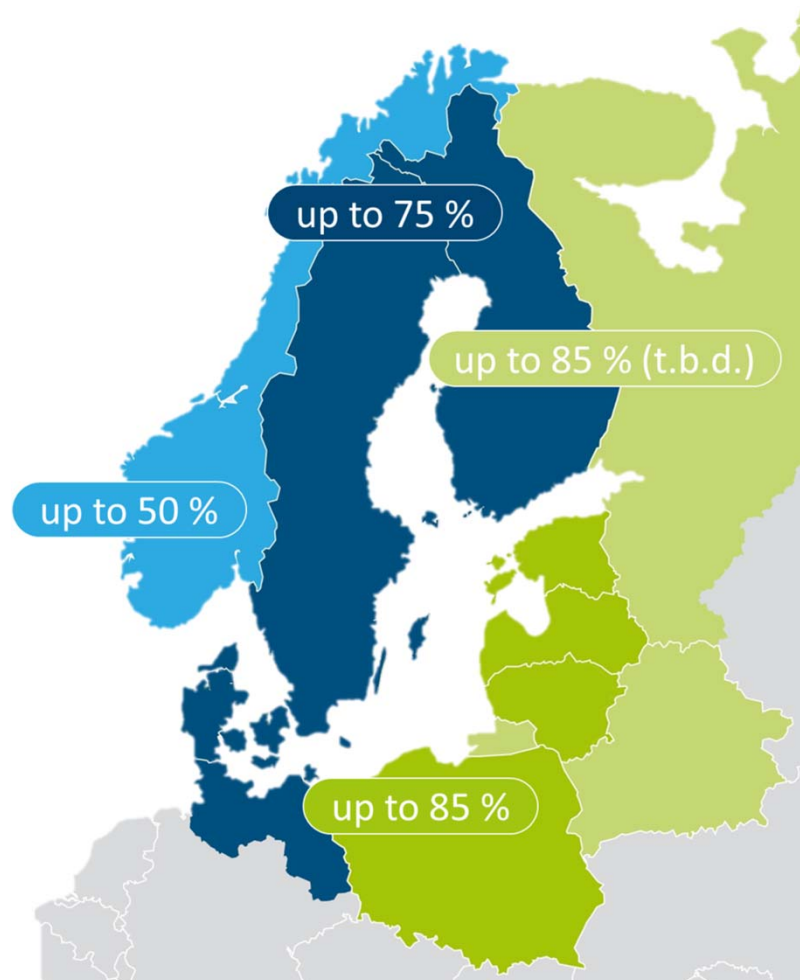
IBSR – Programme Area

*“As a general rule, ERDF co-financing is only provided to project partners **located in one of the Member States**. However, **in exceptional cases project partners located outside the Union part of the Programme area** can request ERDF co-financing and join the BSR partnerships.*

Organizations outside the Union part of the Programme area can become project partners only if:

- *their participation brings **added value and expertise to the project implementation**;*
- *their participation is to the **benefit of the Baltic Sea Region**; and*
- *the Member State or third country of origin enters into **agreement with the MA/JS of Interreg Baltic Sea Region on obligations regarding management, control, audit and financial liabilities**“*

IBSR - Co-financing rates



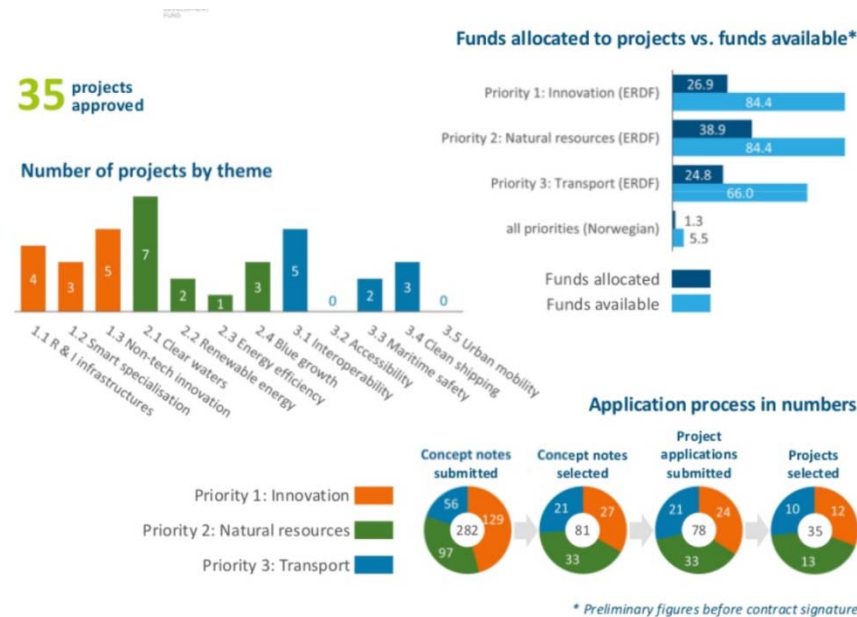
- *Funding modalities for partners from Belarus and Russia will be defined later.*
- *The maximum ERDF co-financing rate that organizations from third countries or Member States outside the Programme area can receive is 75%.*

IBSR – funding budget and rules

Public funding source for “Sustainable transport”: €66 MILLION


Minimum partnership: 3 organizations from 3 different countries

Co-financing for: public authorities, research and training institutions, sectoral agencies, associations, NGOs & enterprises



- *Pass rate for first call proposals in priority Transport was 18 %*
- *Pass rate for second stage was 50 %*
- *Two projects within maritime safety were approved*

R-Mode Baltic project – Current status in IBSR

 **Project idea:**
still under discussion eu.baltic.net

Instructions to use the form
 1. Please only use ADOBE READER 8.0 or higher to fill in the form.
 When using other readers the form is not working properly.
 The latest version can be downloaded e.g. at <http://get.adobe.com/reader/>.
 2. Please ensure that JavaScript is enabled (check main menu > Edit > Preferences > JavaScript).
 3. This is an interactive form. Some parts are only visible when you press certain buttons or enter certain cells. Be aware of this when printing the form.
 4. All guidance is displayed in grey next to the relevant textboxes or tables. No guidance will be visible on the print-out.

Project idea form Version 1.4
 Date: 24/11/2015

The complete project idea form should be submitted to ideas@eu.baltic.net **Submit by e-mail**

This form is the basis for feedback from the JS only. It is not part of the official application procedure !

1. Project idea identification

Project idea name: R-Mode as a new candidate of a terrestrial backup navigation system minimising navigational risk

Project idea acronym: still under discussion

Programme priority: 3. Sustainable Transport

Programme specific objective: 3.3. Maritime safety
 To increase maritime safety and security based on advanced capacity of maritime actors

2. Seed money support ☐ yes ☒ no
Please indicate whether you have received any seed money from EUSBSR Seed Money Facility

3. Potential lead applicant

Name of the organisation (original): Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)

Name of the organisation (English): German Aerospace Center











Website: www.dlr.de

Country: Germany





- submitted project idea form in November 2015
- Based on an initial project idea by GMV
- Joint Secretariat's office in Rostock is informed about the project idea
- contact to BMWi -EB5 (Beziehungen zu Skandinavien, EFTA, EWR, Ostseerat, Europäische Territoriale Zusammenarbeit) → feedback: user of the system must be involved into the project!
- First roughly estimated budget is € 3.5 Million



R-Mode Baltic project – possible projects partners

Name	Task / Expertise	Status	Country
German Aerospace Center	Lead and technological development	Confirmed	
GMV Innovation Solution Spz.o.o.o	technological development in navigation aspects	Confirmed	
German Maritime Administration WSV	German MF IALA beacon and AIS stations	Confirmed	
Swedish Maritime Administration	Swedish MF IALA beacon and AIS stations	Confirmed	
Danish Maritime Authority	Danish MF IALA beacon and AIS stations	Requested with positive feedback	
Finnish Transport Agency	Finnish MF IALA beacon and AIS stations	Requested with positive feedback	
Maritime Office of Gdynia	polish MF IALA beacon and AIS stations	Confirmed	
Alberding GmbH	technological development in data transmission and networks	Confirmed	
BSH	standardization aspects of R-Mode within the scope of all activities for resilient PNT	Confirmed	
Maritime University Stettin	technological development in maritime aspects	Requested with positive feedback	

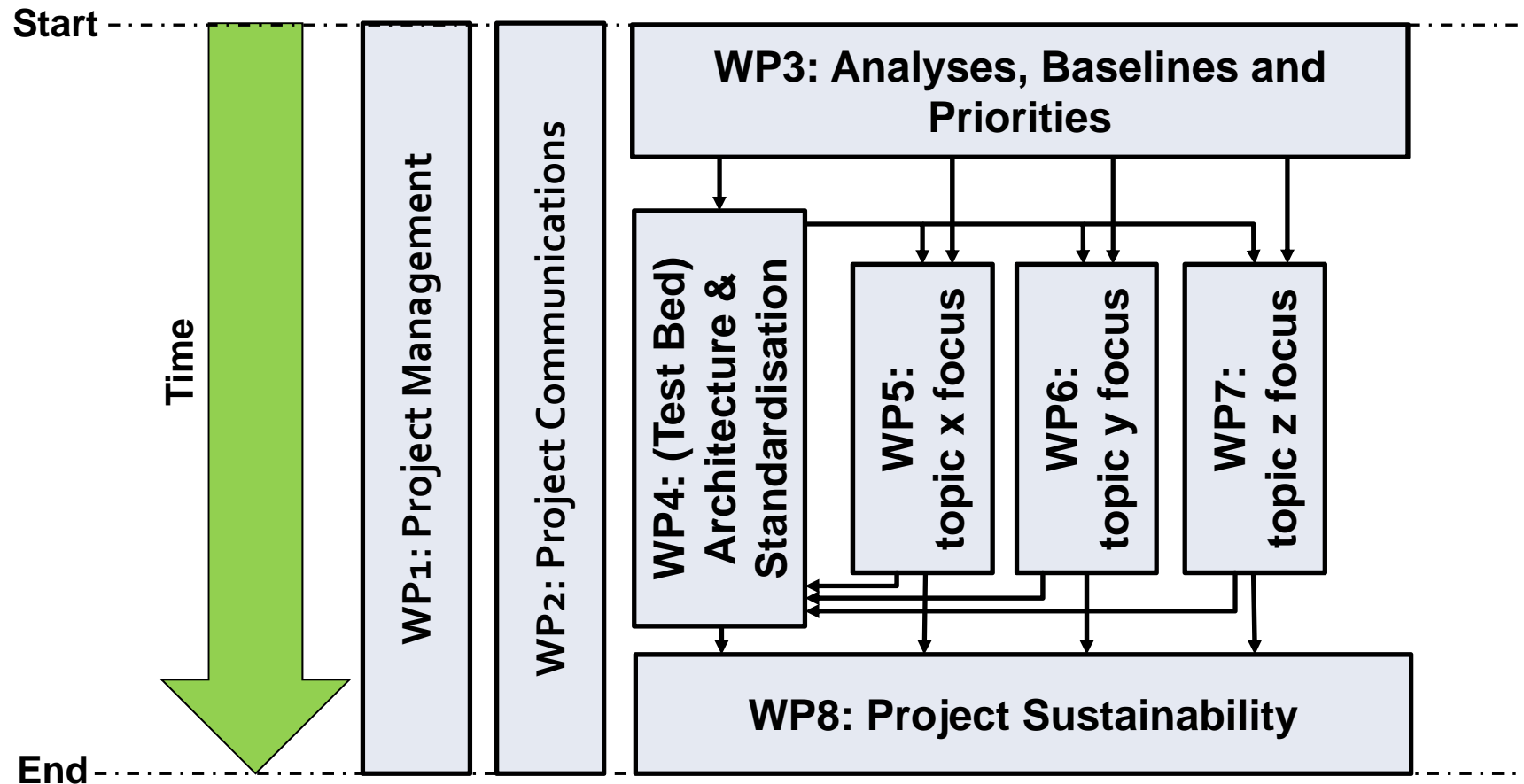
R-Mode Baltic project – possible projects partners

Name	Task / Expertise	Status	Country
Raytheon Anschütz	transition and implementation of the information of the backup system to bridge systems (PNT, INS)	Requested with positive feedback	
Lotsenbrüderschaft NOK	user; application of the technology in real scenarios by measurement campaigns	Requested with positive feedback	
Rijkswaterstaat	TBD	Open	
General Lighthouse Authorities Trinity House	TBD	Open	

Questions and remarks

- *At least one R&D institute and one enterprise from Denmark, Sweden or Finland should be additional integrated*
- *How about participation of Estonia, Latvia and Lithuania?*
- *How about partners from Norway?*

R-Mode Baltic project – possible WP structure



R-Mode Baltic project – Horizontal and vertical integration

- *Proof of horizontal and vertical integration is required by INTERREG program → plan for such integration from the outset (eases later Reviews by INTERREG Program Bureau)*
- *Horizontal Integration: HIG (= Horizontal Integration Group) meetings per each WP*
- *Vertical Integration: VleWS (= Vertical Integration Workshops)*
- *Uniformly use standing Activities in each WP throughout:*
 - *a) Activity WP x.1 – WP management*
 - *b) Activity WP x.2 – WP Horizontal Integration – Horizontal Integration Groups (HIGs) and their flow of meetings;*
 - *c) Activity WP x.3 – WP Vertical Integration = Stakeholder interactions = plan for VleWS to the largest extent possible from outset*
 - *d) Activities WP x.4ff – topical activities*
- *Determine each partners' interests in participation in HI/HIGs from the outset*

R-Mode Baltic project – Standing Groups

- **Project Steering Group (PSC)**
- **Transnational Project Coordination Group (TPCG)**
 - Project coherence across of all WPs
 - Baseline & Priority decisions
 - Project budget
- **Horizontal Integration Group (HIG; one per WP)**
- **Working and Drafting Groups** (as required; informal; per WP and/or Activity)

- **Project Manager**
- **Project Communications Officer**
- **Project Financial Officer**

R-Mode Baltic project – project tasks matrix

Institution / Company →	German Aerospace Center DLR	GMV Innovation Solution Spz.o.o IALA Industrial Member	German Maritime Administration	Maritime Office of Gdynia	Swedish Maritime Administration	Danish Maritime Authority	Maritime University Stettin	Alberding GmbH	Finnish Transport Agency	BSH	Raytheon Anschutz	Lutsenbrüdenschaft	Rijkswaterstaat	The General Lighthouse Authorities of the United Kingdom and Ireland
Country →	Germany	Poland	Germany	Poland	Sweden	Denmark	Poland	Germany	Finnland	Germany	Germany	Germany	Netherlands	United Kingdom
Point of Contact →	Simon Plass (adm.) Thuralf Noack (tech)	Marcus Calveira (adm.) Weronika Malek (tech)	Michael Hoppe Jan Hendrik Oltmann	Mark Dzielicki	Magnus Sundstöm (adm.) Jesper Bäckstedt (tech)	Ivan Carlsson	Zbigniew Pietrzykowski	Jürgen Alberding	Kaisa Heikonen	Jochen Rittersbuch	Christoph Becker (adm.) Ulrich Mangold (tech)	Mr. Hartmann	Pieter Paap	Alan Grant
Status of Project Partner	Lead	Partner	Partner	Partner	Partner	Partner	Partner	Partner	Partner	Partner	Partner	LOI	associated	associated Partner
Management and lead function of the project	x													
Development of a draft test best concept for the Baltic Sea	x		x		x	x		x	x					
Development of required measurement equipment to acquire data via MF and VHF transmissions	x													
Preparation, performance and evaluation of field tests: Measuring the influence of sky wave and other environmental variations	x													
Assessment of the solutions and development of a consolidated test best concept for the Baltic Sea	x													
Development of a solution for time synchronisation independently from GPS time stamp														
Equipment of a set of MF-radio beacons stations with R-Mode functionality														
Upgrade of the existing R-Mode front-end to generate ranging signals based on MF transmissions														
Preparation, performance and evaluation of field tests: concerning the position accuracy of R-Mode based on MF-radio beacons														
Development of a concept to extend AIS Stations with R-Mode functionality	x													
Equipment of a set of AIS stations with R-Mode functionality														
Extension of the R-Mode front-end to generate ranging signals based on AIS transmissions														
Development and integration of R-Mode functionality into a position calculation unit	x													
Further develop the existing R-Mode receiver towards a user friendly receiver														
Perform connection with standardization processes through guidelines and workshops	x													

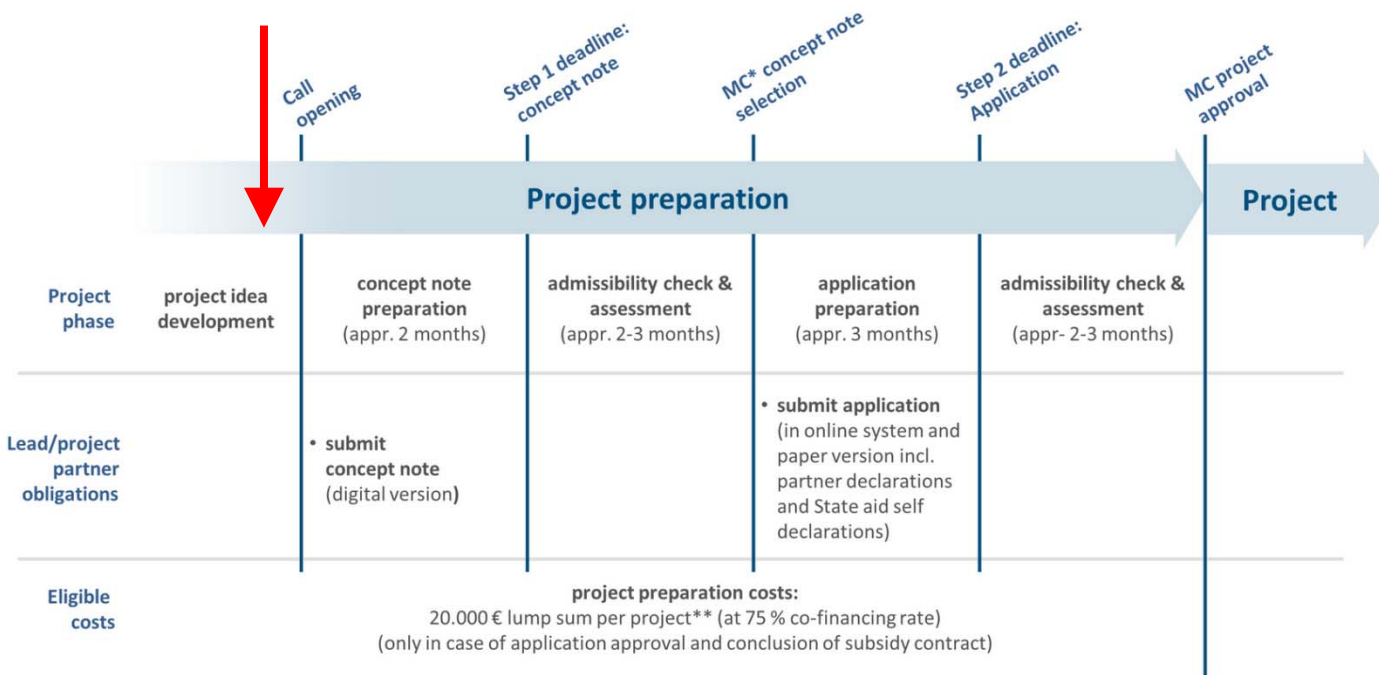


Microsoft
Excel-Arbeitsblatt

The matrix has to be filled by each partner concerning possible contributions

R-Mode Baltic project – next steps


- *Participation agreement of all partners*
- *Definition of all partner contributions and the dedicated budget*
- *Preparation of the concept note*



* Monitoring Committee

** does not apply for projects that have received seed money or other EU financing for preparation

R-Mode Baltic project – Concept Note

 **EUROPEAN UNION**
LEADER OF THE FUTURE

Concept note of the project:

Concept note

Form version 1.1

Call for proposals no. 1

Instructions

1. Please only use ADOBE READER 8.0 or higher to fill in the form. When using other readers the form is not working properly. The latest version can be downloaded e.g. at <http://get.adobe.com/reader/>.
2. Please ensure that JavaScript is enabled (check main menu > Edit > Preferences > JavaScript).
3. This is an interactive form e.g. some parts are only visible when you press certain buttons.
4. Guidance is displayed on grey background next to the relevant textboxes or tables.
5. Please save the data from time to time during your work.
6. To finalise and print please use the button "Validate & finalise & print" at the end of the form.

1. Project identification

Project name:

Project acronym:

Programme priority:

Programme specific objective:

Programme result:

Estimated duration: months (excluding contracting and closure phases)


2. Project summary

Please summarise your project concept. It is recommended to do it after you have completed all the other sections.
(Remaining characters: 1,000)

3. Project relevance


3.1 Challenges to be addressed

Please describe challenges related to the selected Programme specific objective (1) that your project will





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Document

 **EUROPEAN UNION**
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Concept note of the project:

tackle by answering the following questions:

- 1) What is the status quo in the field addressed?
- 2) If planned, please specify the investments.
- 3) Specify the main outputs of the project.
- 4) List and describe the main target groups benefiting from/using each main output.

Explanation: Main outputs are understood as the ultimate outcome of your project. Therefore, do not list, for instance, intermediary research analysis if the ultimate project's output is a larger document which incorporates or is based on the results of this research.
(Remaining characters: 2,500)

3.2 Project results


Please describe the main expected results of the project that will help to tackle the challenges and the gaps identified in the section 3.1. While doing so, please also explain how your project will contribute to the Programme result (1), and in particular how it will help enhance the institutional capacities of the project's target groups.
(Remaining characters: 2,000)


3.3 Compliance with policies and strategies

Please describe the political and strategic background of your project. Please also describe the contribution of your project to any of the policies and strategies.
You might refer to EU, national level, regional or sectoral policies and strategies (e.g. EUROPE, EUROPE, Water Framework Directive, Marine Strategy Framework Directive, TSD, EU North-West Strategy).
(Remaining characters: 1,000)

4. Planned project activities and their main outputs

Please proceed the following way:



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Concept note of the project:

- 2) Outline the planned main activities of the project. Specify activities of transnational character. Please specify the demonstration activities (if any).
- 3) If planned, please specify the investments.
- 4) Specify the main outputs of the project.
- 5) List and describe the main target groups benefiting from/using each main output.

Explanation: Main outputs are understood as the ultimate outcome of your project. Therefore, do not list, for instance, intermediary research analysis if the ultimate project's output is a larger document which incorporates or is based on the results of this research.
(Remaining characters: 4,000)

5. Partnership

5.1 Composition of the partnership in the first step

Please describe the partnership that you have already established.


1. Describe the particular competences/knowledge of the already involved partners to achieve the expected results.
2. If applicable, describe how the private sector (e.g. SMEs) is involved in the partnership.
(Remaining characters: 1,200)


Lead partner (Project partner no. 1)

Original name of the organisation:

English name of the organisation:

Legal status:



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Concept note of the project:

Source of contribution: Public expenditure

Organisation ID:

Registered at:

Type of partner:

Country:

Correspondence address:

Postal code:

Town:

Contact persons

Please indicate the names of the contact persons as well as e-mail and phone number (including country code) of the project coordinator.

Note: In case of approval of the concept note this e-mail address will be used to send the unique login information for the second step of the application process (online form). Please note that the e-mail address remains valid also after the approval of the concept note.

Signature of the concept note:

Project coordinator:

E-mail:

Phone:

Website:

Estimated total partner budget:

Funding source:


Project partner no. 2


Original name of the organisation:

English name of the organisation:

Type of partner:

Country:



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Concept note of the project:

Estimated total partner budget:

Funding source:

Project partner no. 3

Original name of the organisation:

English name of the organisation:

Type of partner:

Country:

Estimated total partner budget:

Funding source:

5.2 Partners and/or associated organisations to be added in the second step

Please describe type of partners that you intend to add to your current partnership:

1. Describe competences/knowledge of partners that are currently missing in the partnership.
2. Specify if you plan to involve private sector and how (to register project partners or associated organisations?).
(Remaining characters: 1,200)

6. Planned budget


6.1 Estimated total project budget


This section indicates the estimated project budget. The amounts of partners listed in the concept note are summed up automatically. In addition amounts planned for partners to be included in the second application step have to be added.

--all partners included in the concept note

Planned ERDF budget (expenditure of partners from EU):

Planned Norwegian budget (expenditure of partners from NO):



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Concept note of the project:

--all partners to be included in the next step

Planned ERDF budget (expenditure of partners from EU):

Planned Norwegian budget (expenditure of partners from NO):

Total budget:

6.2 Estimated budget for investments (if relevant)

Please specify which part of the total project budget is foreseen for investments.


ERDF budget (investments of partners from EU):


Norwegian budget (investments of partners from NO):

Budget for investments:

6.3 Seed/preparatory funding

Please indicate whether you have received any seed money/preparatory funding for development of your project proposal (e.g. ERDF Seed Money Facility, Seedbed Institute, CSI, etc.).



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LEADER OF THE FUTURE

Concept note of the project:

7. Lead partner confirmation and signature (concept note)

For the submission of the concept note please send:

- the electronic version of this file;
- a scanned copy (PDF format) of this last page (Lead partner confirmation and signature), signed by an authorised representative of the lead partner to the application@interreg-baltic.eu. The checklist in both required documents has to be identical! The submission of the concept note in paper form is not required.

By signing this concept note with the checklist

Checklist

the lead partner on behalf of all partners confirms that:

- this concept note is unique in its objective, approach and activities to the best knowledge of the lead partner;
- in case of approval of the concept note, the project partners listed in the concept note are committed to develop a full application in line with the Programme requirements;
- the information in the concept note is accurate and true to the best knowledge of the lead partner.

Name and position:


Signature & stamp:

Date and place:

Generate & Print & Sign

Please press this button before submitting the concept note. It will generate the checklist and open the print dialog to allow you printing of the last page for the requested signature. If you wish to print all pages you have to select all pages in the settings in the printing dialog.

Please note that generating of the checklist can take even several minutes (depending on the amount of text in the form and the performance of your computer).





R-Mode Baltic project – Concept Note

- *Project summary (max. 1000 characters)*
- *Challenges to be addressed (max. 2500 characters)*
 - *What is the status quo in the field addressed?*
 - *What are the main gaps that your project is tackling?*
- *Project results (max. 2500 characters)*
 - *Main expected results*
 - *how does to project contribute to the Programme result?*
 - *how it will help enhance the institutional capacities of the project's target groups?*
- *Compliance with policies and strategies (max. 1000 characters)*
 - *political and strategic background of the project*
 - *contribution to any of the policies and strategies (Water Framework Directive, Marine Strategy Framework Directive, EU2020 etc.)*



R-Mode Baltic project – Concept Note

- *Planned project activities and their main outputs (max. 4000 characters)*
 - *Outline the planned main activities of the project (ultimate outcome)*
 - *Specify activities of transnational character.*
 - *Specify the demonstration actions/pilot activities planned*
 - *Specify the investments.*
 - *Specify the main outputs of the project.*
 - *List and describe the main target groups benefitting from/using each main output.*
- *Composition of the partnership in the first step (max. 1200 characters)*
 - *particular competences/know-how of already involved partners*
 - *how the private sector (e.g. SMEs) is involved in the partnership?*
- *Partners and/or associated organisations to be added in the second step (max. 1200 characters)*
 - *competences/know-how of partners that are currently missing in the partnership*
 - *Specify if you plan to involve private sector and how (as regular project partners or associated organisations?)*
- *Estimated total project budget*
- *Lead partner confirmation and signature*

R-Mode Baltic project – Action Items

AI No	AI description	Responsible	Final Date
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

R-Mode Baltic project – Participation List

Company	Contact person	Email	Phone

Contact informationen

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