Iceland Liechtenstein Norway grants

Environment, Climate Change and Low Carbon Economy Programme

'Environment Programme'

European Economic Area (EEA) Financial Mechanism 2014-2021

Structure of the FINAL REPORT

21/12/2022

13_CALL#2 – GrowingCircle - Integrated Data for Efficient and Sustainable Construction

Accordingly, with the Articles 25.2.j) and 29.4 of the 'Applicants Guide for Financing of Projects Supported by Environment, Climate Change and Low Carbon Economy Programme'.

https://www.eeagrants.gov.pt/media/2994/applicants-guide-for-financing-eea-grants_environment-projects_28112019.pdf

Index

i. Detailed description

i.a) Foreword

The present Report is the GrowingCircle Final Report.

Interim Report #08 addressed the period between June and end of September 2022. This foreword will briefly detail the activities scheduled/that run from beginning of October 2022 to the end of November 2022.

As it will be evidenced, all objectives were achieved, and activities will persist. These aim to continue the translation of documents, carry on the process related with scientific outcomes under revision and/or still to be published, translations of the Data Templates that will support Digital Product Passports, publication of news, reports, and other materials on the GrowingCircle website and LinkeIn page, as well as disclose the project accomplishments.

This Report was developed considering comments and advice presented in Interim Report #08 analysis.

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i.b) Activities in October and November

The project extension request was justified due to the defined schedule of key activities related with the project conclusion and presentation of results. Due to COVID-19 most of the traveling had to be postponed. Between July and November 2022 several activities were scheduled to take place in different locations. The GrowingCircle team strategy was to transform the expected Final Event in 4 events, where a strong representation of GrowingCircle outcomes would be part of the program. The request was mainly to accommodate these actions/events to occur within the framework of Activities 1 and 7. Follows a detailed presentation of the developments within those Activities:

Activity 1 – Project Management:

Several actions deserve to be highlighted.

Regarding the financial execution, the payment of the 4th Request and the preparation of the 5th Payment Request (see Annex 03) are the ones to emphasize.

Periodic meetings with NTNU became more random depending on coordination needs. In this respect it deserves to be highlighted that Professor Eilif Hjelseth came to Portugal to attend the Concreta event (see Activity 7 details) and work sessions at IC – Instituto da Construção headquarters.

Considering the advice on Interim Report #08, we've set reports based on MS Teams Software, as all coordination meetings used this software. The elements can be found in Annex 01. It deserves to be highlighted that during this period there was an invitation to participate in a meeting with DG – Grow, 21st October 2022. The presentation and meeting report are presented also in Annex 01.

Regarding project Results, there were several work meetings with different entities to produce scientific outcomes. These activities are summarized in the two emails "*Invitation_Chapter_Delft*" and "*Invitation_Paper_Leuven*" in Annex 05. Two additional outcomes were produced with the title as follows:

- *"A critical review of material and product passports"*
- *"From Data Templates to Material Passports and Digital Product Passports"*

These are still being revised and will be published in early 2023.

The same situation is occurring with other invitation to present a scientific paper based on the Case Studies:

- *"Exploring the potential of iPad-LiDAR technology for diagnosis in building renovation processes: A case study"*

is the title of the research manuscript submitted and under revision. This constitutes E.3 Deliverable according to file "*GrowingCircle_Management_ver_17*" in Annex 02.

Due to several delays receiving the contributions, the Management Procurement and Law special issue on "Circular Construction" will be published only during the 1st half of 2023.

As referred in Interim Report #08, in Annex 02, two files can be found "*ComunicationPlan_GrowingCircle_FINAL*" and "*GrowingCircle_Management_ver_17*" where tables summarizing elements as Surveys, Newsletters, Website, Specialized Articles, Scientific papers, Conference papers, Promotional Videos, and Events is presented. The second file is more detailed and presents also around 50 actions corresponding to additional achievements.

Finally, two more actions deserve to be mentioned:

- the support on the preparation of a EEA Grants event gathering all Environment projects to occur by October 2023. The draft programme is presented in Annex 01;

- the preparation of two applications for the Fundo de Relações Bilaterais - Open Call #2 (3ª fase) in partnership with NTNU and Cobuilder.

Activity 7 – Awareness and Education:

As mentioned earlier, the extension request aimed to accommodate the time frame where the Concreta fair would happen allowing to present there the GroingCircle project results. This was the main event, and the following links provide details on the action:

- https://haengenharia.pt/noticias/a-concreta-regressa-a-exponor-e-a-oern-tambem/
- https://www.youtube.com/watch?v=BIJjT6Trxyk
- https://www.linkedin.com/posts/icgrowingcircle_circulareconomy-sustainability-digitalization-activity-6987780641383682048-NdoN?utm_source=share&utm_medium=member_desktop

During this period other opportunities and invitations took place and the GrowingCircle project was present in two closing sessions of sister projects; the CircularEcoBIM (3rd October) and the SecClass (12th December):

- https://www.linkedin.com/posts/3drivers_circularitytool-dynamo-revit-activity-6987860987739533312-8vCh?utm_source=share&utm_medium=member_desktop
- https://www.linkedin.com/posts/secclass-sustainability-enhanced-construction-classification-system_eeagrantspt-eeanorwaygrants-bim-activity-7004515960929828864-hPRv?utm_source=share&utm_medium=member_desktop

Given the interaction with Sevilla University it was possible to schedule a short stay in that institution where the project was presented as part of the IMPACT.BIM seminar (22nd to 24th November).

Three additional opportunities came up to integrate GrowingCircle outcomes. One was a lecture to Salford University, UK (3rd October), presentation of a part of the deliverables on a Sustainability course delivered by IC – Instituto da Construção/FEUP – Porto University (2nd and 3rd November), a presentation of the project outcomes and relation with ETIM in the APCMC DataCheck seminar in Coimbra (15th November).

All elements related to these actions are presented in Annex 06.

i.b) Events/Activities status

As requested in Interim Report #08, the following table presents an overview of all actions scheduled and framed on the different activities, as well as their level of accomplishment during the project. This table is also presented as part of the elements in Annex 02.

Table 1: Events/actions status

Events/actions	Expected	Accomplished	Level of Accomp. (%)	Activity	Observations
Project timeline/duration					
Survey	2	2	100%	Act.1	As scheduled
Survey #1 (PDT Awareness)					
Survey #2 (Data Template Awareness and Competencies)					
Newsletters	12	13	108%	Act.1	As scheduled
Newsletter #1 (APCMC: GrowingCircle kick-off / PDT Awareness / Survey #1)					
Newsletter #2 (Cluster Habitat: GrowingCircle kick-off / PDT Awareness / Survey #1)					
Newsletter #3 (Cluster Habitat: Survey #1 results / Special issue and actions)					
Newsletter #4 (Cluster Habitat 11/2021: Web-lecture #1 + GrowingCircle Certification Level 1 - Awareness)					
Newsletter #5 (Cluster Habitat 06/2021: GrowingCircle Talks - lançamento)					
Newsletter #6 (Cluster Habitat 09/2021: GrowingCircle Talks - Pedro Mêda and José de Matos - APCMC)					
Newsletter #7 (Cluster Habitat 10/2021 - Website and CIBW78 talks with Léo van Berlo CTO BuildingSMART)					
Newsletter #8 (Cluster Habitat 11/2021 - GrowingCircle Workshop, Data Templates Awareness)					

Newsletter #9 (Cluster Habitat 01/2022 - Apresentação do projeto GrowingCircle à Associação Brasileira de Normas Técnicas)					
Newsletter #10 (Cobuilder Newsletter - January 2022 - GrowingCircle and Cobuilder sign a strategic partnership to facilitate digitalisation of the construction sector in Portugal)					
Newsletter #11 (Cluster Habitat 04/2022 – Apresentação do Projeto GrowingCircle com o Cobuilder França para o setor da construção frances)					
Newsletter #12 - Resultados do projeto GrowingCircle em apresentação na Concreta					
Newsletter #13 - Vídeo GrowingCircle - Concreta					
Site	1	1	100%	Act.3	As scheduled (took some more time to become online)
GrowingCircle site					
Specialized articles	3	5	167%	Act.7	As scheduled
Specialized article #1 (PDT Awareness - Survey results)					
Specialized article #2 (Portuguese communication agencies, eight articles)					
Specialized article #3 (Data Templates e Passaporte dos Materiais - duas faces da mesma moeda ou a mesma face da moeda?)					
Specialized article #4 Sustainable Built Environment – site EN/PT					
Specialized article #5 Jornal Construir (GrowingCricle: Trabalhar a economia circular a partir da informação e dos dados)					
Scientific papers	3	3	100%	Act.7	

Scientific paper #1 (Data Templates – traceability and digital record through project life-cycle)					
Scientific paper #2 (Incremental Digital Twin conceptualisations targeting Data-Driven Circular Construction)					One was antecipated and the last one was delayed. This had to do with other ongoing works and with the publishing opportunities
Scientific paper #3 (Exploring the potential of iPad-LiDAR technology for diagnosis in building renovation processes: A case study)					
Conference papers	4	5	125%	Act.7	As scheduled
Conference paper #1 (Enabling Circular Construction Information Flows Using Data Templates)					
Conference paper #2 (Digital Twin in Construction using Building LogBooks and Data Templates)					
Conference paper #3 (Tech enablers to the EU Renovation Wave: Framework-based on the Communication (2020) 662)					
Conference paper #4 (A process-based framework for digital building logbooks using business process modelling)					
Conference paper #5 (What Comes First when implementing Product Data Templates? A Portuguese social housing refurbishment case study)					
Promotional Video	3	8	267%	Act. 6	The Case Study videos were produced at project end and still need to be improved. The delay is related with the construction works development and weather conditions.
EEA grants page pitch					
Cases Studies					
The Project					
Workshops	6	7	117%	Act. 7	

Workshop #1 (Workshop online - Digital Tvilling for økt bruk og gjenbruk av data for bærekraftsvurderinger; 10th March; english/norwegian)					Started after what was expected. This was due to changes on the development strategy, COVID-19 and other contigencies presented in the Interim Reports
Workshop #2 (Workshop online - Data templates Awareness and practical uses; 17th May; english)					
Workshop #3 (Workshop online - Kompetanser for økt bruk og gjenbruk av data for bærekraftsvurderinger; 20th May; english/norwegian)					
Workshop #4 (Workshop online - Competences for increased use and reuse of data for sustainability assessments; 7th June; english)					
Workshop #5 (Workshop hybrid, Cobuilder event April 1st 2022 in Paris - Data: one of the pillars of digital continuity and the value of the built environment)					
Workshop #6 (ECPPM 2022)					
Workshop #7 (Sustainability course - 2nd and 3rd November)					
Final conference	1	4	200%	Act.7	The objectives were expanded given the project developments and the opportunities that came up
ECPPM 2022					
Sustainable Places 2022					
Concreta 2022					
Impact.BIM seminar					

ii. Results achieved

Following the recommendations, this section of the Final Report should present:

- a table with a resume of the project material execution, by activity and the indicators relating with the agreement (see Table 2);
- evidence of the communication plan follow-up to evidence the how the project promotion went (the resume was presented in Table 1. Detailed elements can be found in Annex 02, files "*ComunicationPlan_GrowingCircle_FINAL*" and "*GrowingCircle_Management_ver_17*").
- evidence of the activity's accomplishment and development in accordance with the programme; Table 3 (see Annex 02, file "4.3_Schedule_GrowingCircle_theoretical_practice");

Table 2 presents the Material Execution and Tasks Indicators relevant to the project's events/activities. This table is also presented in Annex 02, file "Project Tables_OverallExecution_FINAL". It provides the Material Execution focused on the project metrics and goals defined. The results are detailed by Activity. However, a global indicator for the project must be set and for that the following assumptions are considered:

- the 12 expected deliverables are equivalent to 66% of the accomplishments. This means that each deliverable represents 5,50% of the execution.
- the 250 supported SMEs represent 34%.

All Activities have accomplished or surpassed the expected outcomes. With this it is meant to state that the material execution was, at least, 100% in each task.

13 Deliverables were produced from the 12 expected. These are summarized in Annex 04.

404 entities were accomplished from the 250 expected.

Based on the assumptions the GrowingCircle Global Material Execution is 126,44%.

Table 2: Tasks Indicators, Level of Accomplishment (by activity)

Material Execution FINAL RESUME

Activity ID	Activity Description	Indicador	Target	Final Result	Execution Rate	Source of Verification
1	Project management	ND	ND	ND	ND	ND
2	PDT follow and set-up	Number of Innovative solutions for increased resource efficiency piloted	1	1	100%	Product Data Template Structure and supporting guideline for stakeholders fulfillment: - IC_GRCircle#6920_2.2
3	Information Framework Database	ND	ND	ND	ND	ND
4	PDT on the construction process	Number of Innovative solutions for increased resource efficiency piloted	3	3	100%	Documents/guidelines produced: - DL_IC_GRCircle#6920_4.1 - DL_IC_GRCircle#6920_4.2 - DL_IC_GRCircle#6920_4.3
5	PDT for Built Environment	Number of Innovative solutions for increased resource efficiency piloted	2	2	100%	Documents/guidelines produced: - DL_IC_GRCircle#6920_5.1 - DL_IC_GRCircle#6920_5.2
6	Case Studies/Implementation	Construction and demolition waste avoided by the supported sectors	15,0%	73,98%	493,15%	Analysis from the results - Case Study#06 Railway
		Number of Innovative solutions for increased resource efficiency piloted	5	6	120%	Report on improvements, surveys with stakeholders: - 6.1.1_Overall visionMH_Case Studies and Case_00_uptade - Case Study #01 - Data Templates Evaluation - Case Study #02 - Data for Asset Management - Case Study #03 - Waste Audit - Case Study #04 - Design for Disassembly - Case Study #05 - Data for Sustainability
7	Awareness and Education	Number of SMEs supported	250	404	161,60%	Attendance certificates, surveys

Table 3: Activity's scheduled accomplishment (as initial agreement vs as occurred after approvals)

				Report 1				Report 2				Report 3				Report 4				Report 5				Report 6				Report 7						Report 8				Final Rep.	
ID Atividade / Activity ID	Descrição Atividade / Activity Description	Promotor / Parceiro - Promoter / Partner	Sechedules (expected/accomplished)	2021																		2022															
				8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12					
Act.1	Project Management	IC /NTNU	Expected																																		
			Accomplished (with approval)		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Act.2	PDT follow and set-up	NTNU / IC	Expected																																		
			Accomplished (with approval)		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x												
Act.3	Information Framework Database	IC /NTNU	Expected																																		
			Accomplished (with approval)		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x								
Act.4	PDT on the construction process	IC /NTNU	Expected																																		
			Accomplished (with approval)										x	x	x	x	x	x	x	x	x	x	x	x	x												
Act.5	PDT for Built Environment	IC /NTNU	Expected																																		
			Accomplished (with approval)										x	x	x	x	x	x	x	x	x	x	x	x	x												
Act.6	Case Studies/Implementation	IC	Expected																																		
			Accomplished (with approval)															x	x	x	x	x	x	x	x	x	x	x	x	x	x						
Act.7	Awareness and Education	NTNU / IC	Expected																																		
			Accomplished (with approval)				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		

Due to its length, in Annex 02, file "GrowingCircle_Comunication Plan_initial_performed" presents an overview of all communication activities that were envisaged and how did they occur in practice.

Regarding the clarification request associated to Case Study#06 Railway, the detailed explanation can be found in Annex 07. In resume the situation is the following:

- In theory, it would be possible to reuse/recycle 99,98% of the railway elements (in weight);
- However, during the discussion with IP – Infraestruturas da Portugal and in light of the new regulation on waste, several questions were raised regarding the possibility of reusing/recycling all the ballast;
- A significant part of it can be reused in the same work, either to become part of the new ballast or to be used as filling material for bridges, platforms, drainage elements, among others;
- A part of the ballast, corresponding to around 26,00% of the total weight of the materials (around 22,54% of the ballast weight), is not suited to be used in the same work, meaning that its reuse will be in other works. IP usually delivers this ballast to municipalities. However, the new legislation requires the ballast analysis, and several doubts were raised regarding the way this process should occur. To not deliver potential hazard materials to other entities, this amount of ballast is presently rejected. This leads to the reduction from 99,98% to 73,98% in terms of railway elements reuse/recycling.

GrowingCircle Activity 3 – Information Framework Database

When the application was submitted there was the intention of preparing Data Templates (DTs) that would be used for the case studies. The project developments and the publication of strategic documents within EU brought clarity to this process, where Digital Product Passports (DPPs) gain strength as the main instruments to collect all kinds of data related to products. On going developments at EU level and where GrowingCircle is engaged define DPPs as:

"passports that "provide information on a product's origin, durability, composition, reuse, repair and dismantling possibilities, and end-of-life handling".

"a structured collection of product related data with predefined scope and agreed data ownership and access rights conveyed through a unique identifier", set on "decentralised system with a central registry" with "Information related to sustainability, circularity, value retention for reuse/remanufacturing/recycling".

Although highly focused on sustainability, the CPR proposal points to digital Declaration of Performance (DoP) and new requirements for harmonized standards to become more aligned with digital data. This is a hot topic that will be highly discussed during 2023. Nevertheless, the database that we set up is composed by several Data Templates for generic products. Their characteristics will continue to be set up and translated. The following images present several prints of the database back office.

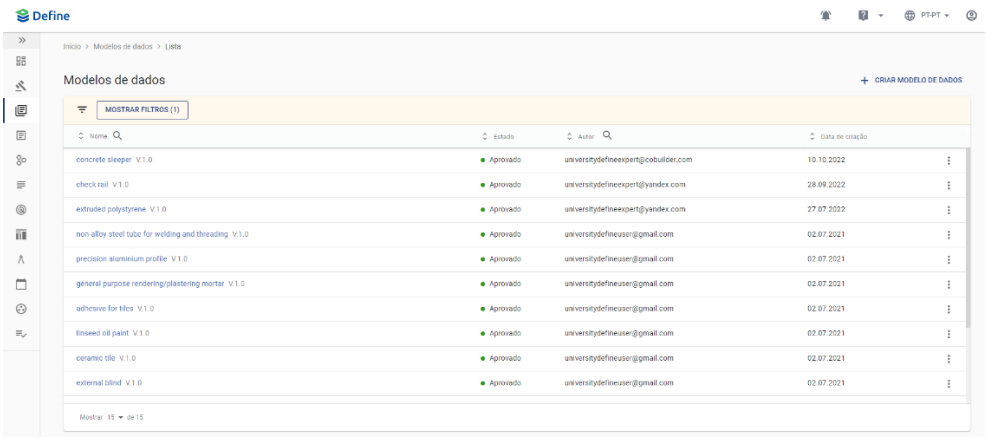

Figure 1 – Define tool. Menu where Data Templates are presented. In GrowingCircle context 15 DT exist.

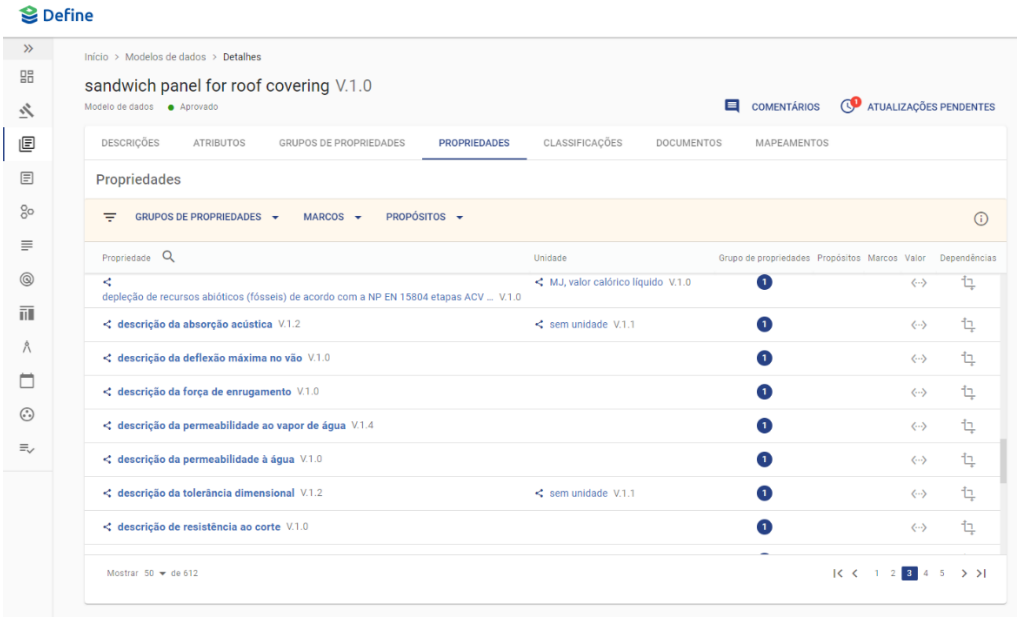

Figure 2 – Define tool. Menu where Properties are set in the context of a Data Template. In the case the sandwich panel for roof covering DT.

DTs are the “skeletons” on information with ability to support values from specific products. As part of the database a product catalog was built with the real products used on the

renovation use case. The available data was introduced, and the works will continue to evaluate the manufacturers' ability to provide other data sets. The following image presents the front office of the products catalog and all contents can be explored in: https://growingcircle.cobuilder.com/

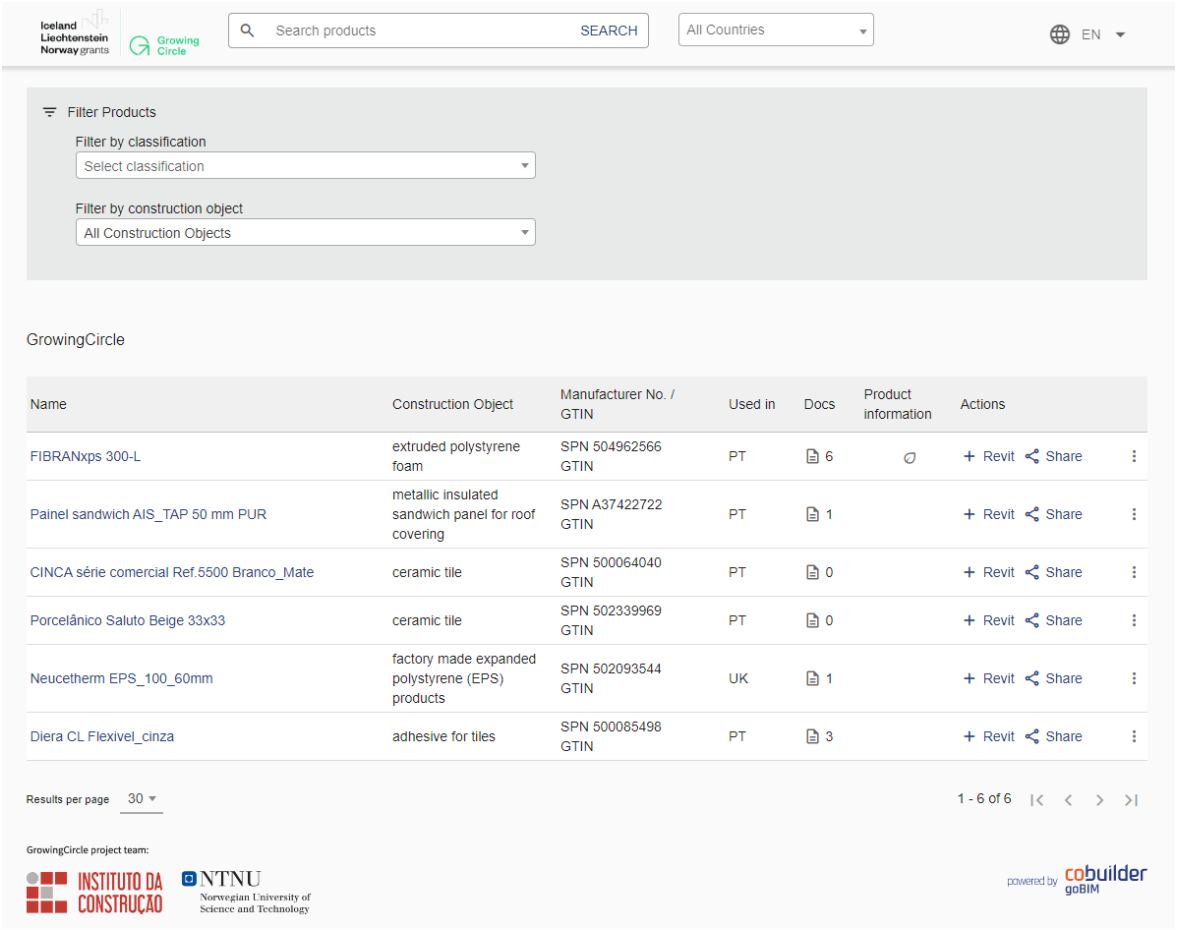

Figure 3 – GrowingCircle product catalog with products used for the case study.

iii. Description of costs and financial impact assessment

Four payment orders have been processed and accepted in addition to the advance payment requested on the project's initial phase.

With the payment of the 4th Payment request 76% of the approved overall budget is consumed.

The last report evidenced that the financial execution would be around 91%, considering all assumed commitments and expenses already set and to be included on the 5th Payment request. In the same document it was stated that the project team expectation was to execute the budget by 95 to 98%.

All documents related with the 5th Payment request are set on Annex 03.

The following tables (Tables 4 and 5) address previous reports and the advice made in the last Interim Report analysis regarding financial execution disclosure.

Table 4: Financial Execution - Overview

Financial Execution FINAL RESUME

Activity ID	Activity Description	Until February 2022	Until September 2022 (compromised)	End of the project (end November)	5th Payment Request (€)	Remarks
1	Project management	48,86%	81,40%	97,90%	34,50%	The amount on the 5th Payment Request corresponding to this activity is 30.615,45, representing 33,0% of IC budget for this activity and 51,5% of NTNU
2	PDT follow and set-up	65,34%	94,20%	97,40%	14,20%	The amount on the 5th Payment Request corresponding to this activity is around 17.000,00, representing 16,0% of IC budget for this activity and 13,0% of NTNU
3	Information Framework Database	89,34%	99,80%	99,80%	4,10%	The amount on the 5th Payment Request corresponding to this activity is 1.786,59, representing 4,1% of IC budget for this activity
4	PDT on the construction process	80,26%	100,00%	100,00%	0,60%	The amount on the 5th Payment Request corresponding to this activity is 78,50, representing 0,6% of IC budget for this activity
5	PDT for Built Environment	70,62%	100,00%	100,00%	14,60%	The amount on the 5th Payment Request corresponding to this activity is 1702,50, representing 14,6% of IC budget for this activity
6	Case Studies/Implementation	0,33%	98,40%	98,50%	25,80%	The amount on the 5th Payment Request corresponding to this activity is 2755,49, representing 25,8% of IC budget for this activity
7	Awareness and Education	53,50%	85,80%	93,80%	40,30%	The amount on the 5th Payment Request corresponding to this activity is 13.074,08, representing 61,1% of IC budget for this activity and 14,4% of NTNU
	TOTAL	**61,50%**	**91,27%**	**97,80%**	**Global project Execution**	

Table 5: Financial Execution – Detail by Activity and Entity

Financial Execution RESUME by Activity and Entity

Activity ID	Activity Description	Entity	Initial Budget	Executed Budget	Execution Rate (%)	Global Execution
1	Project management	IC	81 300,00 €	79 479,98 €	97,8%	97,90%
		NTNU	7 410,00 €	7 410,00 €	100,0%	
2	PDT follow and set-up	IC	49 860,00 €	49 675,87 €	99,6%	97,40%
		NTNU	71 680,00 €	68 699,25 €	95,8%	
3	Information Framework Database	IC	43 580,00 €	43 506,03 €	99,8%	99,80%
4	PDT on the construction process	IC	12 590,00 €	12 590,00 €	100,0%	100,00%
5	PDT for Built Environment	IC	11 650,00 €	11 650,00 €	100,0%	100,00%
6	Case Studies/Implementation	IC	10 700,00 €	10 700,00 €	98,5%	98,50%
7	Awareness and Education	IC	18 010,00 €	17 330,22 €	96,2%	93,80%
		NTNU	14 425,00 €	13 096,20 €	90,8%	
	TOTAL					**97,80%**

iv. Description of the project's contribution to achieving the overall objectives of EEA Grants and the 'Environment Programme'

As stated in the Partnership Agreement, the GrowingCircle project falls within the following Expected Outcomes of the Programme:

- PA11 Outcome 1, Increased application of circular economy principles in targeted sectors;

- Output 1.4, Increased resource efficiency in the construction sector.

	Indicador	Atividade relacionada	Contributo do projeto
PA 11 Objetivo 1	Use of secondary materials increased in the supported sectors (percentage)	ID6	73,98%
	Number of jobs created	ID	0
	Tonnes of plastic recycled through all supported schemes/measures	ID	0
Output 1.4	Number of innovative solutions for increased resource efficiency piloted	ID2 ID4 ID5 ID6	13
	Number of SMEs supported	ID7	404
	Number of demonstration buildings constructed	ID	0

Related to PA 11 Outcomes 1, the presentation of the railway Case Study and its discussion led to several reflections together with the partner entities, namely IP – Infraestruturas de Portugal. At this level awareness of stakeholders was accomplished, followed by the discussion on the challenges on how to implement the new regulation and the processes yet to be defined to support the use of secondary materials. In railway, reuse is an ancient practice mostly implemented to save money. The weights and the environmental goals were not part of the vision, but they were somehow associated to the economic motivation. The challenge is to maintain the practices and fulfil all reporting requirements. This is found to be difficult in the present moment. The same feeling was shared when this case study was presented internationally. The new Construction Products Regulation will partially support the law in terms of materials reuse, but adjustments on processes and clarification of some guidelines is key to enable this to happen. On the other side the case study evidenced how Waste and Demolition plans should be structured to meet these requirements. It became also clear that infrastructure projects, namely railways, are more prone to accomplish and surpass the goals defined. Buildings are a more challenging task.

Related with Outcome 1.4, the awareness course and the workshops are among the high impact actions in terms of stakeholders' engagement. During the last 6 months of the project the invitations to participate in other activities and the development of presentations were responsible for accomplishing and surpassing the defined goal. Different audiences came to out sessions from researchers to contractors, owners, design teams and manufacturers, namely after the publication of the first draft of the Construction Products Regulation. This is mainly due to the requirements on construction products digitalization where DTs and DPPs can position as the solutions for that.

The presentation of the Case Studies results in different events raised awareness on how to combine existing processes with new requirements. As well, it helped stakeholders to better understand how the goals can be accomplished. From the different Case Studies, the ones that raised more immediate interest were the ones related with Waste Audit, and link of the Product Catalog with 3D models. The multi-criteria evaluation of the renovation process of residential buildings caught attention in different events, from scientific to industry. The growing interest in the Level(s) analysis schema will bring more attention on the next months to that specific Case Study. In this respect the translation to English was requested, and is an ongoing process, due to several requests.

Given the scientifical and technical approaches, that necessarily have different views, stakeholders reacted positively to the innovative solutions presented, engaging on the challenges, and raising questions towards its implementation.

The ongoing discussion on the Construction Products Regulation proposal will bring even more this topic to the forefront of the concerns and GrowingCircle was pioneer on raising these issues and providing some awareness on the topic. This occurred at National level (Portugal), in Norway and across Europe member-states.

It deserves to be highlighted that the GrowingCircle project was several times asked to present the findings to EU entities. The last action took place on the 21st October 2022 with DG-Grow representatives.

The project aims also to contribute to the macro-objectives of the programme by providing examples of Data Templates and one example of a training action organized together between the Portuguese and the Norwegian partners. The elements will become available at the project website.

Projector Promotor

Name	Pedro Nuno Mêda Magalhães
Date and Signature	Assinado por: **PEDRO NUNO MÊDA MAGALHÃES** Num. de Identificação: 12101647 Data: 2022.12.30 16:31:22+00'00'
Position	IC Researcher / GrowingCircle Technical Coordinator

CARTÃO DE CIDADÃO

Programme Operator – Secretary General for Environment

Name	Alexandra Carvalho
Date and Signature	Maria Alexandra Martins Ferreira de Carvalho Assinado de forma digital por Maria Alexandra Martins Ferreira de Carvalho DN: c=PT, title=Secretária-Geral, o=Secretaria-Geral do Ambiente e da Ação Climática, cn=Maria Alexandra Martins Ferreira de Carvalho Dados: 2023.03.10 16:48:47 Z
Position	Director of Secretary General

ANNEXES

- A01 – Project Management – Meetings minutes
- A02 – Project Management – Schedule, Budget and Indicators
- A03 – Final Payment Request
- A04 – Material Execution_Indicators and Deliverables
- A05 – New Scientific Deliverables
- A06 – Activity 7 outcomes
- A07 – Clarification Regarding the Railway case study