



JRC TECHNICAL REPORTS

European Innovation Partnership on Raw Materials

*Annual Monitoring Report
2020*



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Contact information

Name: Dominic Wittmer

Address: Via Enrico Fermi 2749, 21027 Ispra (VA), Italy

Email: GROW-EIP-RAW-MATERIALS@ec.europa.eu, EC RMIS <EC-RMIS@ec.europa.eu>

JRC Science Hub

<https://ec.europa.eu/jrc>

EC Raw Materials Information System (RMIS)

<http://rmis.jrc.ec.europa.eu>

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Authors: Dominic Wittmer, Cynthia Latunussa.

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¹ DG GROW: EIP monitoring and evaluation scheme, see: https://ec.europa.eu/growth/sectors/raw-materials/eip/monitoring-evaluation_en

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Acronyms

AMR	Annual Monitoring Report
CfC	Call for Commitments
EIP	European Innovation Partnership
EIP-RM	European Innovation Partnership on Raw Materials
EIT	European Institute of Innovation and Technology
EU	European Union
KIC	Knowledge and Innovation Community
MoU	Memorandum of Understanding
MEP	Member of European Parliament
RMC	Raw Material Commitment
SIP	Strategic Implementation Plan
SME	Small and medium-sized enterprise
UN	United Nations
WEEE	Waste electrical and electronic equipment

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Authors

Dominic Wittmer, Land Resources Unit, JRC D.3

Cynthia Latunussa, Land Resources Unit, JRC D.3

Contribution statement

The AMR survey was set up based on earlier survey editions by D. Wittmer with support from C. Latunussa and C. Veeh. The survey was managed by D. Wittmer, including the support to survey participants and quality control of survey inputs.

D. Wittmer analysed the data on partnership, coverage of SIP themes, financial input, and future plans, and drafted the related chapters of the report manuscript plus the introduction and executive summary (chapters 1 to 3.1, chapter 3.4, annex). C. Latunussa analysed the data on research, dissemination and coordination activities and the Commitment outputs (chapters 3.2 to 3.3).

C. Veeh is responsible in DG GROW for the EIP-RM monitoring and support of this EIP Annual Monitoring Report. She guided this AMR activity to ensure its usefulness for the EIP on Raw Materials community and its policy relevance. This included feedback on the survey and on the report at each stage of development.

D. Pennington coordinated the overall EIP Monitoring support activities in JRC, being involved in reviews at every stage of development of this AMR.

Executive Summary

The European Innovation Partnership on Raw Materials (EIP-RM) is a stakeholder platform that brings together representatives from industry, public services, academia and NGOs. Its mission is to provide high-level guidance to the European Commission, Member States and private actors on innovative approaches to the challenges related to raw materials.

The Strategic Implementation Plan (SIP) of the EIP-RM sets specific objectives and targets, to be achieved through a range of proposed actions including research and innovation coordination, technologies for raw materials production, substitution, framework conditions, knowledge and skills and international cooperation. To implement these actions – which cannot be done by the European Union (EU) institutions alone – the European Commission launched Calls for Commitments.

Commitments are joint voluntary undertakings by several partners, who commit themselves to carrying out activities that contribute to achieving actions and targets of the EIP-RM. This Annual Monitoring Report (AMR) report provides an overview on the state-of-play of these Commitments for 2020.

Based on a survey launched in March 2021, the “AMR2020 Survey”, this Annual Monitoring Report provides an overview on the **state-of-play of Raw Material Commitments (RMCs) of the European Innovation Partnership on Raw Materials (EIP-RM) at the end of 2020**. It aims to inform policy makers in the field of non-food, non-energy raw materials at EU and member state level as well as the community of RMC leaders or other stakeholders interested in the overall development of the RMCs. As the EIP-RM is a multi-annual activity, this annual monitoring reflects a snapshot for the year 2020.

KEY DATA ON THE COMMITMENTS ACTIVE IN 2020

The EIP-RM commitments are continuously developing. At the end of 2020, **the EIP-RM counted around 300 unique partners**, including 18 partners from non-EU countries. Overall, Spain remains the best represented country in EIP Commitments with 64 unique partner organisations, followed by Italy with about half the number of unique partners.

In early-2020, the EIP-RM had 35 Commitments. For several years, **the Commitments covered all Priority Areas of the EIP-RM in a relatively balanced way**. The completion of several Commitments, and also disqualifications², progressively led to a smaller number of active Commitments, and thus to an imbalance of priority areas and themes. In the period 2016-2019, between four and six commitments finished each year. Four Commitments finished in 2020 and four were disqualified. This brought the total of active Commitments to 27.

The changes in 2020 reduced the number of active Commitments on themes ‘Processing’ and ‘Waste management’ (both Priority Area I.B) from six to four in each.

The Commitments have reported a **total indicative budget of €1979 million**. This is the cumulative sum of the budget needed for implementing all the Commitments over the period of the EIP-RM, referring to the total for both active and non-active Commitments.

FUNDING

Progress of the EIP-RM depends on the **funding secured**. New funding enhances the potential impact in relation to targets stated in the EIP-RM’s Strategic Implementation Plan (SIP). **This funding secured by the Commitments over time, the so-called cumulative secured budget, increased modestly, by €32 million reaching a level of about €716 million.** Accordingly, the share of *cumulative secured budget* secured in the *total indicative budget* reached its maximum with **36% in 2020** (see Table 1).

² Commitments are disqualified after two consecutive years without responding to the AMR surveys. Subsequently, these Commitments are not anymore considered active and thus not invited to the surveys.

In 2020, the number of RMCs reporting EU funding dropped to three, securing together about €12 million. For the first time the annual EU funding was exceeded by the annual public funding of €20 million. Finally, three RMCs secured **private funding** totalling about **€40 000**.

Over the period 2014-2020, **EU funding** stays the largest source of funding totalling **€323 million**, mostly through Horizon 2020. The cumulative funding volume that the RMCs have received from **national and regional funding** since 2014 reached **€142 million**. The number of countries providing national or regional funding escalated in 2018 to **25 different countries**³, remaining at this level since then. Private funding over the period 2014-2020 amounted to **€135 million**.

ACTIVITIES

With few exceptions, Commitments reported to have undertaken activities towards their objectives since 2014. Activities continue to mainly relate to the categories **knowledge sharing/dissemination of information and best practices** followed by **international cooperation**.

OUTPUTS

Most of the Commitments responding to the survey continued to deliver tangible outputs in 2020. The outputs are in various forms, which address one or several EIP targets. They include patent applications, policy recommendations, roadmaps, research agendas, events/workshops, websites etc.

Most outputs in 2019 contributed to **Target 3: Framework conditions for primary raw materials** (34%) followed by **Target 4: Framework conditions for materials efficiency and waste management** (22%), and **Target 1: Innovative pilot actions** (22%)⁴. The outputs delivered by the Commitments in 2019 were mostly under categories **knowledge sharing, innovative actions or pilots** and **international cooperation**. Many of the RMCs that responded to the AMR Survey delivered outputs in more than one output category.

³ 24 member states (Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Ireland, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom), plus Norway.

⁴ Percentage points refer to year 2019.

Table 1 provides an overview of the report's **key performance indicators**.

Table 1: Key performance indicators (December 2020) for Raw Material Commitments (RMC)

Key performance indicator	2013 Call for Commitments	2015 Update on RMCs from 2013	2015 Call for Commitments	2016 Update	2017 Update	2018 Update	2019 Update	2020 Update	Total at beginning of 2021
				on RMCs from 2013 / 2015					
Number of commitments	80	- 4	+ 47	-24	-37	-12	-15	-8	27
Number of unique partners	699	+ 56	+ 223	-125	-210	-92	-167	-79	305
Total indicative budget	€1744 million	- €58.4 million	+ €294 million	n.a.	n.a.	n.a.	n.a.	n.a.	€1979 million
Budget secured ⁵	€268 million	+ €123 million	n.a.	+ €113 million	+ €71 million	+ €61 million	+ €48 million	+ €32 million	€716 million
Share of indicative budget secured	15%	23%	n.a.	n.a.	25%	29%	32%	36%	36%
Outputs, cumulative	ca. 200	ca. 500	n.a.	ca. 900	ca. 1300	ca. 500	ca. 800	n.a.	n.a.

Source: JRC analysis

⁵ The "Budget secured" in the table included approximately €115 million of EU funding that RMCs had already secured at the time of the 2013 Call for Commitments (cf. EIP-RM Annual Monitoring Report 2014, p.8). Values shown are rounded, therefore the total can deviate from the sum of the annual values.

1 Introduction

1.1 The European Innovation Partnership on Raw Materials

The European Innovation Partnership on Raw Materials (EIP-RM) is a stakeholder platform that brings together representatives from industry, public services, academia and NGOs. Its mission is to provide high-level guidance to the European Commission, Member States and private actors on innovative approaches to the **challenges related to raw materials**.

The **Strategic Implementation Plan (SIP)**⁶ of the EIP-RM sets specific objectives and targets, to be achieved through a range of proposed actions including research and innovation coordination, technologies for raw materials production, substitution, framework conditions, knowledge and skills and international cooperation.

To implement these actions – which cannot be done by the European Union (EU) institutions alone – the European Commission launched two **Calls for Commitments**⁷ to Member States, industry, academia and other relevant stakeholders in October 2013 and December 2015. A third open **Call for Commitments** ran from late spring 2018 to summer 2020.

The **'Raw Material Commitments'** (RMCs) are joint undertakings by several partners, who commit themselves to carrying out activities that will contribute to achieving the actions and targets of the EIP within the period 2014-2020. Consequently, the EIP on Raw Materials ceased at the end of the year 2020.

In some cases, commitments are specific projects, or project proposals. But, in general, commitments are a range of activities, including projects of different sizes, nature, project run times, and project teams. Such projects can be funded by various project schemes (Horizon 2020, Horizon Europe, LIFE, COST etc.) and thus have different characteristics.

In line with its neutral role, JRC is not involved actively in any commitment and participates only in very few of the related projects.

1.2 The EIP Annual Monitoring Report

The purpose of the Annual Monitoring Report (AMR) is to provide an overview on the **state-of-play of the Commitments**, based on indicators that measure the RMC inputs and outputs. As the EIP-RM is a multi-annual activity, this annual monitoring report is the recent edition of a series of reports. It follows the structure of the previous reports since the main source of information is the annually conducted survey, which is only slightly modified over time. This AMR reflects a snapshot for the year 2020.

The AMR informs policy makers in the field of non-food, non-energy raw materials at EU and member state levels, and EIP-RM stakeholders, including the community of RMC leaders. It equally informs other stakeholders interested in the overall development of the EIP-RM and RMCs.

The data used come from the information provided during the Calls for Commitments and from the annual AMR surveys. While participation in the AMR survey is mandatory – every second year – to maintain their status as recognised active Commitments, the quality and utility of the responses vary across the Commitments' contributions. There are no

⁶ https://ec.europa.eu/growth/sectors/raw-materials/eip/strategic-implementation-plan_en

⁷ https://ec.europa.eu/growth/sectors/raw-materials/eip/commitments_en

sanctions imposed in case of disqualification, as there is no direct linkage between a commitment and project funding.

As this annual report focuses on the state-of-play of commitments, there is no explicit focus on the impact of the commitments. Commitments equally vary in nature and the number of projects that they include. An analysis of the impact of the commitments, including of the underlying projects, is not within the scope of the monitoring of the EIP-RM.

The results of this monitoring exercise feed into the SIP Implementation Document and the Strategic Evaluation Report⁸.

⁸ See the EIP Monitoring and Evaluation scheme:
https://ec.europa.eu/growth/sectors/raw-materials/eip/monitoring-evaluation_en

2 Overview of the Commitments

The EIP-RM organised **two Calls for Commitments**, in **2013** and **2015**. A third and last **Call for Commitments** ran from late spring 2018 to summer 2020. From the 2013 Call for Commitments the EIP Sherpa Group accepted **80** Commitments, while the 2015 Call led to **47** additional Commitments. The third, continuous call did not result in new Commitments.

Commitments that do not fill in the annual monitoring survey or respond to the invitation email for two consecutive years lose their recognition as a Raw Materials Commitment. In 2020 this was the case for four Commitments⁹. Moreover, four Commitments finished their mission and/or activities in 2020¹⁰, after six in 2019, five in 2018, four in 2017 and six in 2016. This way the EIP counts **27 Commitments** at the end of 2020. Overall, the annual decrease halved to 8 in 2020, after 15 in 2019 (12 in 2018, 22 in 2017 and 45 in 2016).

This section presents an overview on the coverage of the SIP, the Commitment partners and their indicative budgets.

Further details on all the endorsed Commitments can be found on the EIP website: https://ec.europa.eu/growth/sectors/raw-materials/eip/commitments_en

2.1 Commitments and coverage of the Strategic Implementation Plan

>> The coverage of the different Priority Areas is partly out of balance

Table 2 displays the coverage of the SIP Priority Areas, attributing each RMC to one Priority Area.

From the beginning of the EIP-RM, all Priority Areas were relatively well covered, considering that some Priority Areas (e.g., Priority Area I.C on substitution) are more specific than others. The 2015 Call for Commitments attracted very few Commitments on framework conditions for waste management (Priority Area II.B), while there were quite a lot of new Commitments covering biotic materials. The successive cessation of numerous Commitments has caused significant drops in the total number of recognised Commitments. In the AMR 2020 Survey, 24 RMCs responded by filling the AMR 2020 Survey online or indicating the status of the Commitment; this results in a response rate of 69%. This is about the same response rate as the two preceding years, and one and a half times the response rate of the AMR 2017 Survey. However, for certain analyses only a subset of Commitments (14; 40%) was available, as the remaining Commitments (10; 29%) include those ones merely reported in 2020 to be finished or idle, respectively.

Annex 1 further provides an overview of the coverage of the EIP's Action Areas, based on Commitments' selection of up to 5 relevant Action Areas.

At the AMR2020 Survey, the following additional information have been gained on the status of Commitments:

- four Commitments reported to have finished their mission and/or activities: BioAlMinore, EU-NARS-G, EURELCO, SUSMINE;
- six Commitments reported no advancements were undertaken in 2020.

⁹ BioAlMinore, EU-NARS-G, EURELCO, SUSMINE.

¹⁰ Finished in 2020: ITERAMS, MetGrow, Mineland, NOWMOB.

Table 2: Number of RMCs covering each Priority Area in 2020. The Commitments that responded to the AMR2020 Survey are put in bold, those that finished in 2020 and/or lost their recognition are in *italics* (number indicated in brackets), and those that responded to the AMR2020 Survey and finished are in bold and *italics*.

Priority Area or theme	Relevant Raw Materials Commitments	Number of RMCs
Priority Area I.A. 'Raw materials research and innovation coordination'	none	0 (0)
Priority Area I.B. 'Technologies for primary and secondary raw materials production'		
>> Land mining (exploration/mining)	ExECRoMe, NEXT , SIMS, SmartExploration, SOcRATES, SOLSA	6 (0)
>> Deep sea mining (exploration/mining)	Blue Nodules	1 (0)
>> Processing	<i>BioAlMinore</i> , CuBES , INCOMES , MetGrow , Mud2Metal , PolymetOre	6 (2)
>> Waste management	C&D-WRAM , EARTH 2020 , <i>EURELCO</i> , ITERAMS , pHMine , ZeroWaste-NoI	6 (2)
Priority Area I.C. 'Substitution of raw materials'	<i>EQUATOR</i> , <i>EU-NARS-G</i>	2 (1)
Priority Area II.A. 'Improving Europe's raw materials framework conditions'	BioDIMA , EMD , ENSQM , Mineland¹¹ , MIREU¹¹ , SUMAN2000 , <i>SUSMINE</i>	7 (2)
Priority Area II.B. 'Improving Europe's waste management framework conditions and excellence'	none	0 (0)
Priority Area II.C. 'Knowledge, skills and raw materials flows'	EUMINET	1 (0)
Priority Area III. 'International cooperation'	IMAGINE , INTERMIN	2 (0)
Biotic materials	NOWMOB , RUBB-ENDURE, RUBBERTOMARKET , WRING	4 (1)

Source: JRC analysis

¹¹ Mineland and MIREU are RMCs active in the period 2018-2020, in contrast to the information shown in AMR2017.

2.2 Partners

>> Since its beginning, the EIP on Raw Materials lost successively more than two thirds of its partners counting about 300 at the end of 2020

In 2013, about 700 partners¹² related to 80 commitments belonged to the EIP-RM¹³. Between 2013 and 2015, one third of these RMCs reported through the AMR 2015 Survey an evolution of their partnership. Despite the disqualification of four RMCs and the consequential loss of 27 partners, the update by the AMR 2015 Survey showed a net increase by 56 new partners of the EIP-RM. Moreover, the 2015 Call for Commitments attracted another 223 partners, related to 47 commitments, bringing the overall EIP partnership to a peak of about 980 partners.

Since then, no new Commitments entered the EIP-RM, but many left due to reaching their goals or lifetime, or disqualification. This evolution is attended by an annual decrease also in the number of partnerships of the remaining RMCs. The **overall EIP partnership** thus decreased to about 850 partners in 2016, 650 partners in 2017, 550 partners in 2018, and 400 partners by the end of 2019.

The cessation of RMCs continued also in 2020: Four RMCs were disqualified, and four further RMCs reported to have finished their mission and/or activities. Thus, the number of Commitments decreased by 23% to 27 active Commitments at the end of 2020. Regarding partnership, this means a decrease by about 80 partners to about 300 partners at the end of 2020 (Table 1). In summary, the **overall EIP partnership** lessened between 2016 and 2019 by about 670 partners¹⁴, meaning a loss of about 70%.

>> Unevenness in Member State participation increased

Figure 1 presents the distribution of the **unique partners per Member State**. Overall, **Spain** remains, as the years before, the best represented in the EIP Commitments (with 64 different partner organisations). Spain is followed by **Italy** with 31 unique partner organisations, and France and Germany with 22 and 20 unique partner organisations, respectively. Further countries with good representation in the RMCs are Sweden and Portugal with almost 20 unique partner organisations. The number of unique partners decreased on average for EU member states by 21%, which is almost nine percentage points lower than the year before. With a lower average number per country, its relative decrease varies significantly. For example, a special drop in unique partner organisations is reported for Belgium, where the number dropped by more than 65%. The number of **partners from non-EU countries**¹⁵ decreased by 10%, now counting 18 partners.

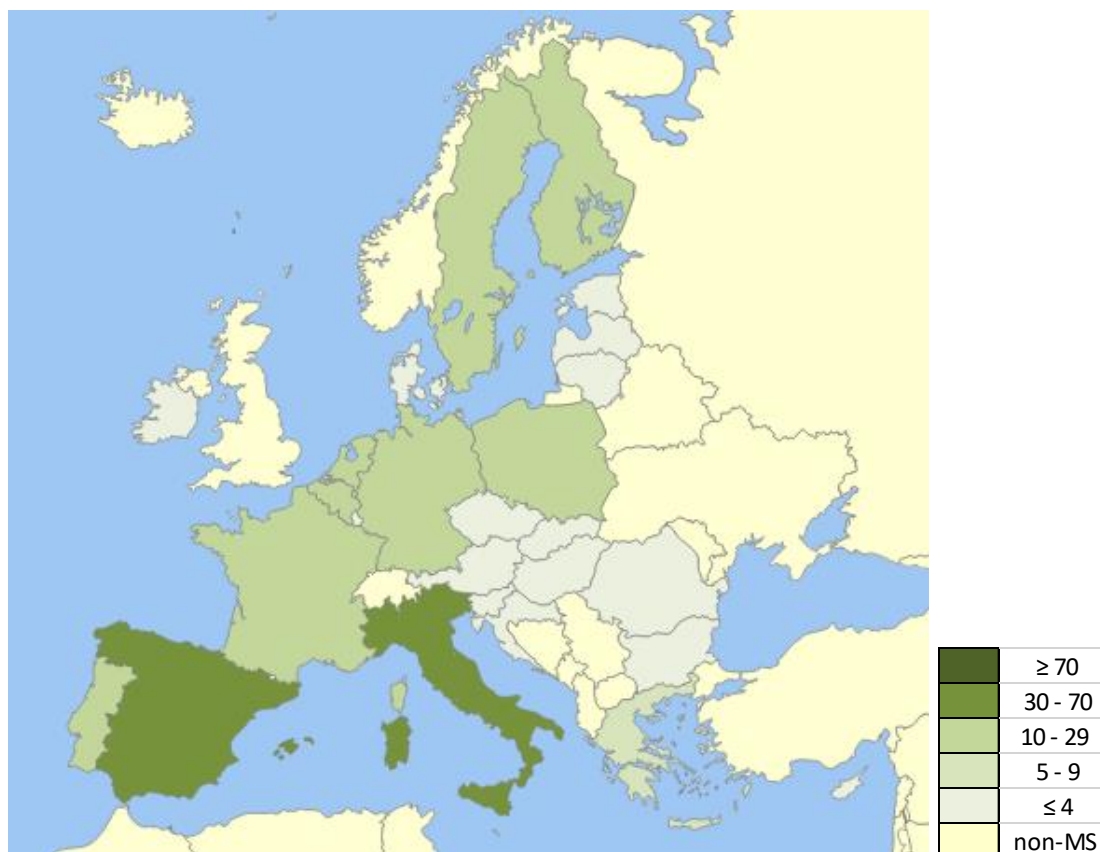
¹² The analysis distinguishes between the sum of "partners" and of "unique partners", in order to exclude double counting of partners participating in more than one Commitment. This report refers always to "unique partners", but for the reason of readability, the term "partners" is used throughout the report.

¹³ The 80 commitments are the ones accepted after the 2013 Call for Commitments.

¹⁴ minus 125 in 2016, minus 210 in 2017, minus 100 in 2018, minus 150 in 2019 (approximate values)

¹⁵ The participation by non-EU countries is increasingly concentrated by few countries, led by Norway (3) and Chile (3). Further countries with various unique partners include Switzerland, the United States and Serbia.

Figure 1: RMC partner coverage, total number by Member State, 2020.



Source: JRC analysis

Spain (6) and Italy (5) are well represented in **RMC leadership**¹⁶, with pan-European organisations (8) also leading a significant number of RMCs. Finland, however, left this group as its leadership dropped from six to two, similar to France the year before.

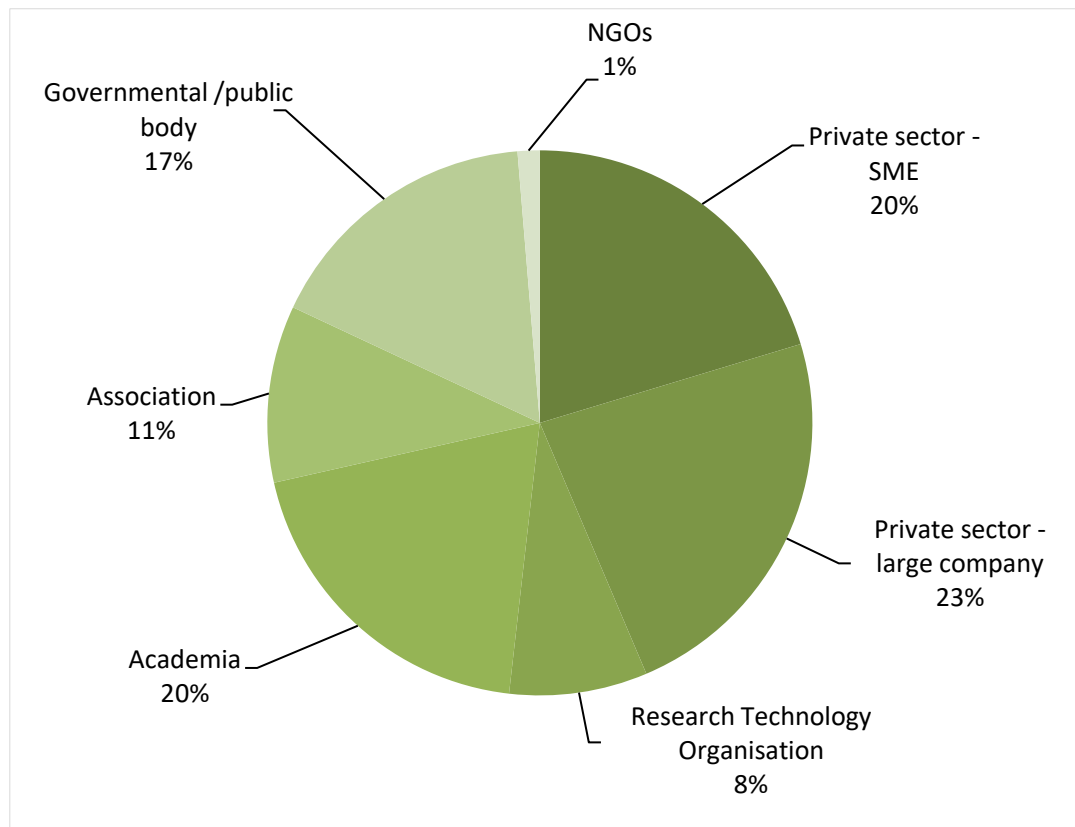
>> There is a balanced participation of organisations from the public and the private sector, yet NGOs are relatively under-represented

Figure 2 presents that, in terms of RMC partners, **participation in the EIP stayed relatively evenly balanced between the public and private sectors**, despite the decreasing numbers. Since 2018, a slight shift (< 5%) is reported from the private sector to public bodies, and associations. As a result, almost half (43%) of the organisations that participate in Commitments come from the private sector, both large companies, and small and medium-sized enterprises (SMEs); while SMEs showed a slightly higher share in 2019, the situation switched with large companies showing a slightly higher share in 2020, representing almost one quarter (23%) of all organisations that participate in Commitments. In addition, associations representing the private and non-private sector make account for 11%. Participation by NGOs were underrepresented from the beginning.

In essence, the distribution by type of RMC partners continues to be very stable, while a slight shift has been reported from the private sector (SMEs) towards governmental and public bodies.

¹⁶ The term RMC leadership is the location where the coordinating organisation of the Commitment is registered.

Figure 2: Type of RMC partners, in %, 2020



Source: JRC analysis

3 Monitoring Progress of Commitments

This chapter presents **the progress made by the Commitments** of both the 2013 and the 2015 Call for Commitments that are recognised at the beginning of 2020. Like at the AMR 2018 Survey and AMR 2019 Survey, almost 70% of these Commitments responded to the AMR 2020 Survey.

Indicators for monitoring, measuring and mapping the state-of-play of the ongoing EIP-RM Commitments are presented in three sections:

- (1) inputs (human resources, funding, etc.);
- (2) activities undertaken in the year;
- (3) outputs (pilot actions, documents, meetings, etc.).

3.1 Inputs

The purpose of this section is to analyse the overall state-of-play of the adopted Commitments with respect to total funding secured, and to identify the proportion of projects that are on track versus those at risk, e.g., those lacking funds.

Overview

>> The RMCs reported to have secured significantly more than a third (36%) of their total indicative budgets

Prior to the Annual Monitoring Report 2020 Survey, RMCs had reported the securing of €676 million¹⁷. **At the time of the Annual Monitoring Report 2020 Survey, the RMCs reported to have further secured €32 million.** This means that the EIP Commitments have now secured approximately **€716 million** out of the updated total indicative budget of €1979 million, or **36%** of their total indicative budgets (compared to 15% in 2014, 23% in 2015, 25% in 2016, 29% in 2017, 32% in 2018, and 35% in 2019).

The **trend of the total budget secured**, cumulative for the years 2014-2020, is summarised in **Figure 4A**, while the reported budget secured for the period 2014-2020 is shown by type of resources in **Figure 4B**.

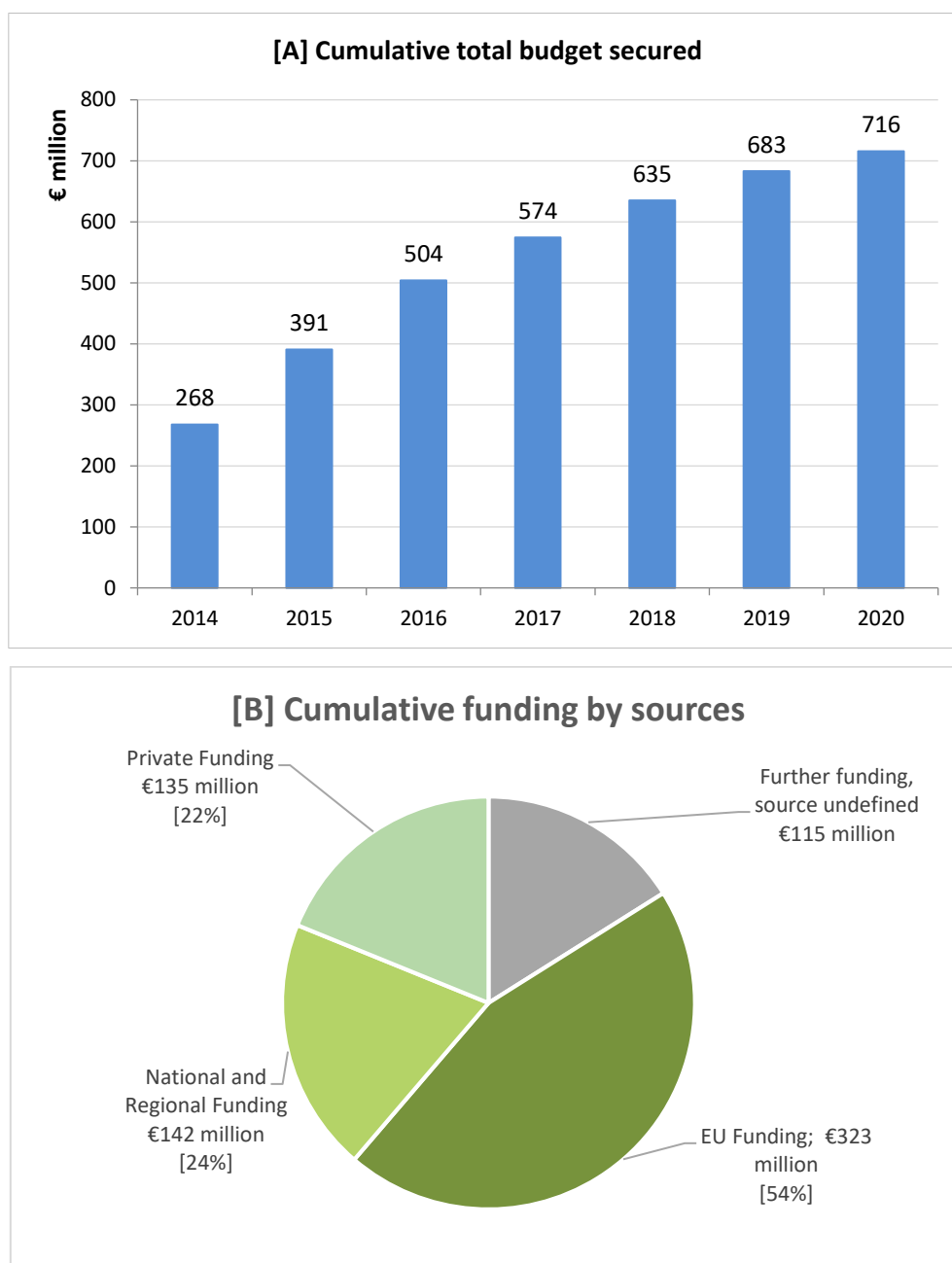
The **cumulative total budget secured grew rather evenly** over the period 2014-2020, starting from a total budget of €268 million and reaching now more than €700 million. The absolute annual increase continues to slow down significantly, with a marked drop in both absolute and relative terms in 2017.

Since 2014, the largest proportion of funding has come from the EU (Figure 4B); for the period 2014-2020 the cumulative EU funding amounts to more than half of the total (54%), equivalent to €323 million. Private funding of €135 million represents about one-fifth (22%) of the total funding secured since 2014. Funding from public national and regional sources is more than €142 million over the same period, representing about a quarter (24%).

In contrast to these cumulative shares, the shares of annual funding sources vary significantly. After four years (2015-2018) of continuous drop down of both absolute volumes of annual private funding, and its relative share, and a peak in 2019, the annual private funding almost seized up in 2020 with just about €40 000.

¹⁷ This includes the budget indicated by the 2013 Call for Commitments.

Figure 4: Secured funding for EIP Commitments: [A] Cumulative total budget secured in the period 2014 to 2020, in €; [B] Cumulative budget secured split by type of sources since 2014, in € million¹⁸ and % (disregarding “Further funding” category). Budgets are in nominal values.



Source: JRC analysis

¹⁸ The “Cumulative budget secured” in Figure 4B excludes approximately €115 million of EU funding that RMCs had already secured at the time of the 2013 Call for Commitments.

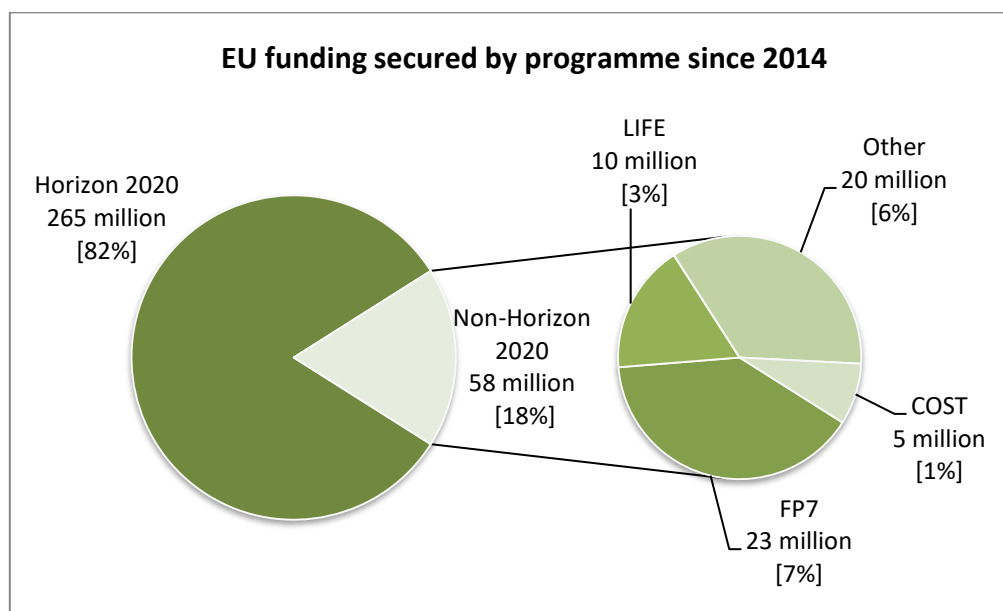
EU Funding

>> *The Horizon 2020 programme clearly stays the biggest source of EU funding for RMCs, worth €259 million*

In 2020, 3 RMCs reported securing about **€12 million of additional EU funding**. This brings EU funding to €323 million since 2014.

Since 2015, the Horizon 2020 programme has become the biggest source of EU funding. In 2020 the total funding through Horizon 2020 reached €265 million (82%) (Figure 5). The previous research budget, FP7, which ran from 2007-2013, funded to the tune of €23 million (7% of the total). For the period from 2015 on, Horizon 2020 funding through the **LIFE programme** amounted to 3% of the total.

Figure 5: Type of EU funding received by EIP Commitments since 2014, in € million and %. Budget from the EIT Raw Materials is included in the Horizon 2020 category



Source: JRC analysis

>> *Alternative EU funding sources account for a minor fraction of funding to the EIP Commitments, while the EIT Raw Materials has become a significant growing source of EU funding*

The **EIT on Raw Materials** funded the Commitments with approximately €23 million in total (compared to €17 million in 2018, €15 million in 2017, 13 million in 2016 and €0.75 million in 2015). Funded RMCs include BioFlex, SolvoFlex, Electroflex, Pyroflex, Residuflex, Preflex, SSIC, ERMAT, GATEWAY and Metnet, PilotMet KAVA Networks of Infrastructures, AMCO, SUPRIM, Mineral products from Petrit-T sidestream, HARSHWORK, Circular TP, SUPRIM, Blue Harvesting, and CIRCuiT. No additional funding by EIT on Raw Materials was reported by Commitments in 2020.

It is notable that since the beginning of the EIP on Raw Materials still no EU funding has been secured from the **European Investment Bank** or the **European Development Fund**; and that only limited funding has so far been received from **Cohesion Policy Funds**.

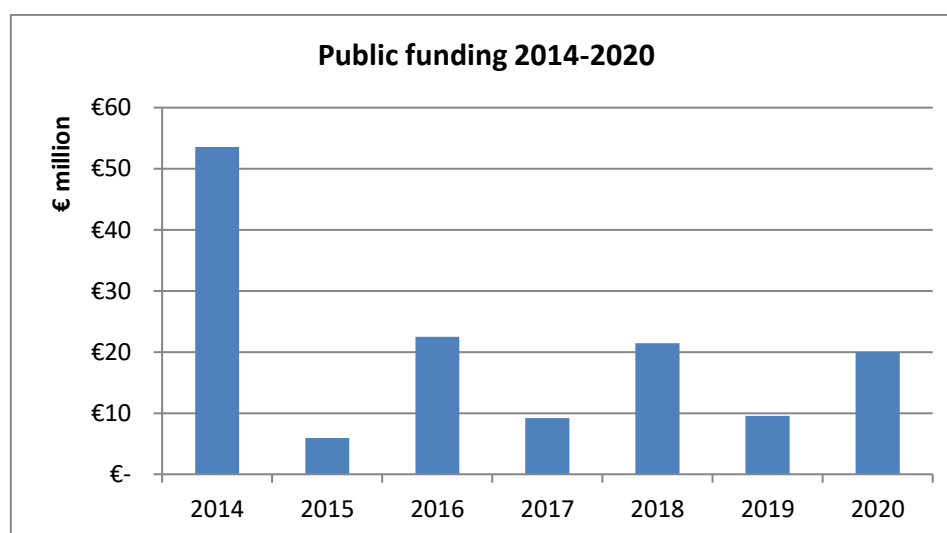
Public National/Regional Funding

>> Since 2014 the RMCs have received more than €142 million; the reported volumes of national or regional funding follow a significant annual up and down

The number of **RMCs receiving direct funding or in-kind contributions from national or regional bodies** across Europe and internationally decreased also in 2020, like in 2019. RMC NOWMOB, which has dominated the public funding for several years, finished in the meanwhile. Only **RMC WRING** reported to have received public funding in 2020, however, this funding from the Marches region was exceptionally high with €20 million. With this single contribution, the volume of the national or regional funding more than doubled compared to 2019, and public funding in 2020 is concentrated on a single country, i.e Italy.

In comparison to private funding and EU funding, national/regional funding appears to be more fluctuating (see Figure 6).

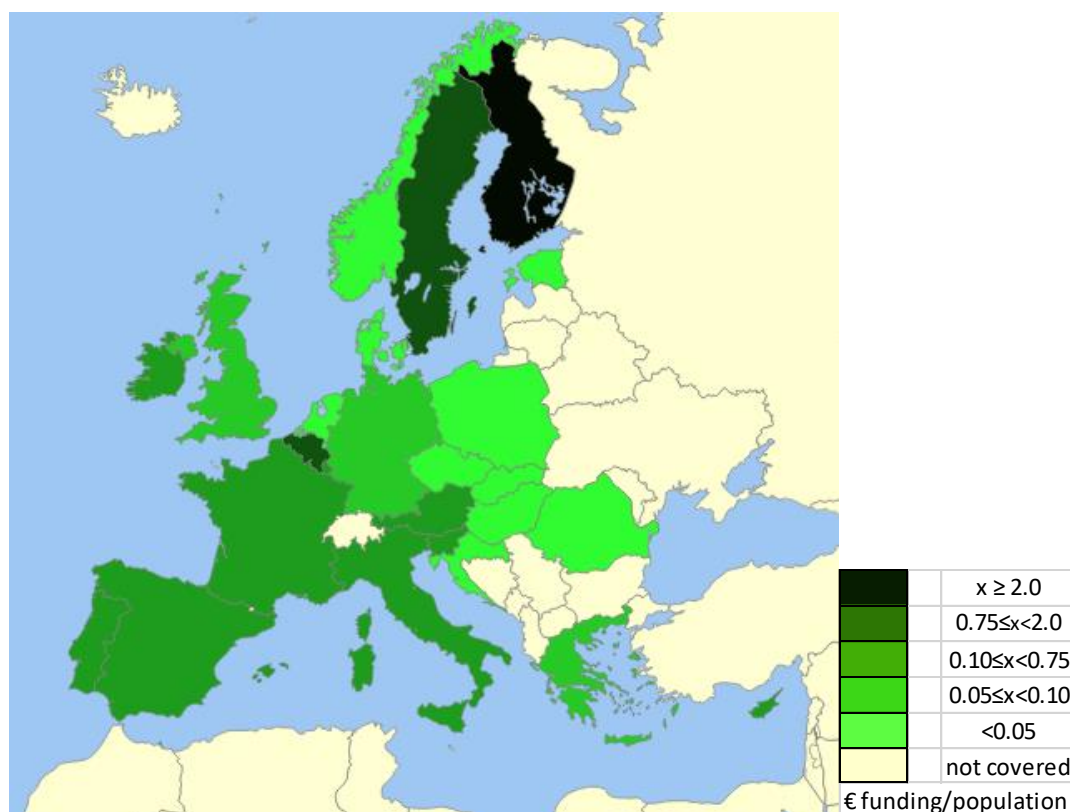
Figure 6: Trend of National or Regional Funding received by EIP Commitments since 2014, in € million



Source: JRC analysis

Since 2014, **35 EIP Commitments** received direct funding or in-kind contributions from national and regional bodies across Europe and internationally. Funding from these organisations amounted to over **€142 million from 25 different countries** (Figure 7) in total. In 2019 funding from regional authorities was actually missing, however, in 2020 it was the sole source of funding. As expected, most countries providing funding are member states, complemented by few non-EU countries (Europe and overseas).

Figure 7: Sources of national or regional funding for EIP Commitments since 2014¹⁹. Population reference year is 2020.



Source: JRC analysis

The member states providing the most funding in a specific year change significantly over time. In this context it is noteworthy that from 2016 to 2018 Finland and Belgium were the member states showing the largest funding volumes, while they were only slightly surpassed by Spain in 2019. In 2020, public funding was reported only by Italy. The cumulative funding since 2014 is highest for Italy (€24 million) due to the exceptionally high funding in 2020, and Sweden (€19 million) due to its lead at the initial phase.

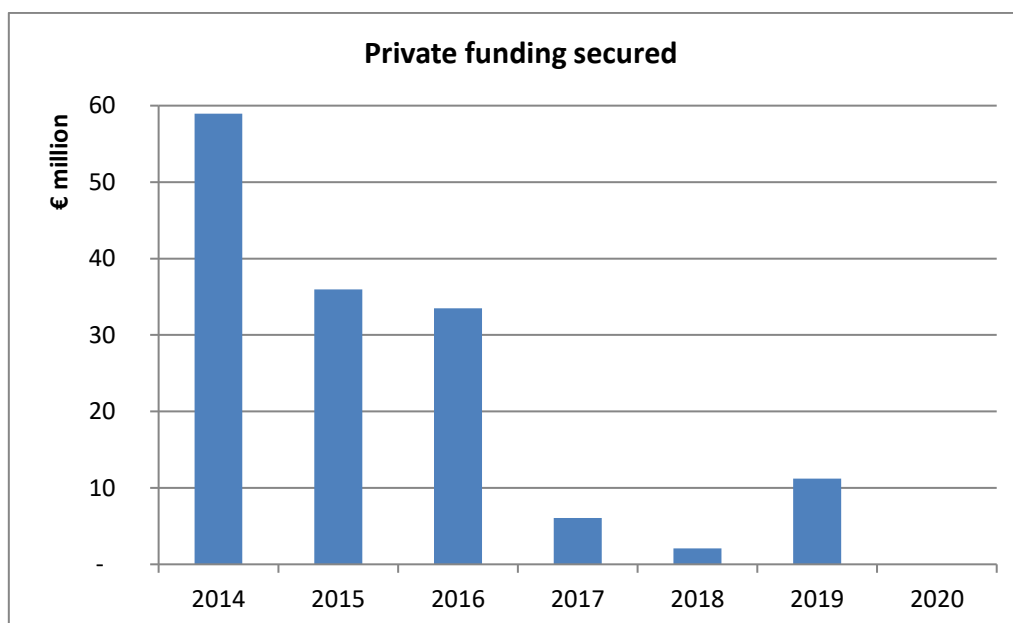
Private Funding

>> Since 2014 more than every second Commitment (56%) received private funding, worth together €135 million. Private funding reported by Commitments practically disappeared in 2020

In 2020, **three RMCs reported to have secured private funding. The total private funding received in 2020 was just €43 000**, following €11 million in 2019. The total number of Commitments having received private funding since 2014 stayed constant (62 Commitments). Like in 2019, the cumulative private funding still totalled **€135 million** (see Figure 8 for a break down and trends).

¹⁹ In the map, the colour-scheme for Member States has been scaled to show funding relative to population figures of the reference year 2020.

Figure 8: Trend of Private funding received by EIP Commitments since 2014, in € million



Source: JRC analysis

3.2 Research, dissemination and coordination activities

Most of the Commitments have concluded their projects in 2020. The RMCs who responded to the AMR 2020 survey reported at least one output. Commonly reported activities belong to **knowledge sharing/dissemination of information and best practices** category.

The following sub-sections highlight a selection of research, dissemination, and coordination activities undertaken by Commitments in 2020.

3.2.1 Research activities

Research activities performed by the Commitments covered several thematic fields, namely primary resources, recycling, substitutes, and harmonisation and modelling of raw materials stocks and flows.

The key achievements in 2020 are the following:

Primary resources

- RMC NEXT developed exploration technologies and data analysis methods, for example a magnetic system datalogger and software for modelling of data from drone-based measurement system. Some of the outputs produced by this RMC have been validated in relevant environment.
- RMC SOLSA developed a drilling technology system that combines sonic drilling and automated real time raw material analysis.

Recycling

- RMC C&D-WRAM has developed recovery and recycling solutions towards near-zero waste for construction and demolition waste, for instance a new blended concrete made from waste. The outputs of this RMC have been demonstrated in operational environment.

- RMC INCOMES developed a strategy for selective bio recovery of critical raw materials from primary and secondary sources of magnesium.
- RMC Mud2Metal developed knowledge and applied technology for recovery of metals (e.g., scandium) from bauxite residues. This recovery process has been demonstrated at industrial pilot level.
- In bio-based raw materials, RMC WRING reported to have validated a state of the art and criteria for best practices identification of wood waste recycling.

There was no output reported related to **substitutes** and **harmonisation and modelling of raw materials stocks and flows**.

3.2.2 Dissemination activities

Many commitments organised dissemination activities during 2020. In the **Waste area**, C&D-WRAM held four webinars in 2020 to present the key findings of the project covering topics such as education, funding and investment in Europe, network of mining and metallurgy.

Other Commitments participated actively in the area **Events: conferences, workshops, and meetings**, such as:

- In the context of the COVID-19 crisis, RMC MIREU and OECD organized a virtual workshop in June 2020 to explore the impacts of the corona virus pandemic on mining regions and cities and the responses and opportunities emerging from this crisis in the short and long term. RMC MIREU also held webinars to present some key findings of their projects, which covered topics such as investment and innovation in Europe, responsible mining, and metallurgy.
- RMC NEXT was presented at three online presentations in 2020 (GeoUtrecht 2020, EAGE Mineral Exploration Symposium 2020, EIT Raw Materials Summit).
- RMC EARTH 2020 – Several events related to the CICERONE project (CIRcular Economy platfoRm for eurOpeaN priorities strategic agEnda) were put in place. The objective of the events was to share the delivered agenda, and to provide inputs for the implementation of Circular Economy activities, including the critical role of raw materials in this process.
- RMC WRING organized stakeholder meetings to validate analysis of state of the art about wood management.
- RMC C&D-WRAM conducted dissemination activities related to the projects HISER, FISSAC, PAPERCHAIN, RE4 and VEEP²⁰.
- RMC SOLSA organized an online dissemination event in January 2021. Moreover, RMC SOLSA Consortium has done 40 presentations in international conferences.

3.2.3 Coordination activities and proposals

²⁰ HISER: Holistic innovative solutions for efficient recycling and recovery of valuable raw materials; FISSAC: Fostering Industrial Symbiosis for a Sustainable Resource Intensive Industry across the extended Construction Value Chain; PAPERCHAIN: Paperchain is a demonstrative project that proposes innovative applications for different underused paper chain industry waste streams, proving their technical, economic and environmental feasibility in five circular business models through real scale pilots; RE4 is a collaborative research project with main purpose to develop a prefabricated energy-efficient building concept that can be easily assembled and disassembled for future reuse, containing up to 65% in weight of recycled materials from CDW; VEEP is a project with main objective to develop and demonstrate a series of technological solutions for the massive retrofitting of our built environment, aiming at cost-effectively reducing building energy consumption.

After 2019, RMC INTERMIN continued its coordination activities and proposals by inviting all training centres belonging to their network to populate the INTERMIN database with more comprehensive information.

3.2.4 International cooperation

In this category, RMC MIREU had a cooperation with the OECD Mining regions and cities project. RMC INTERMIN reported to have been involved in a global network of training centres in the raw material area.

3.3 Outputs

This subchapter monitors the achievements produced by the Commitments in 2020. As in the past editions of the Annual Monitoring Report, the emergence of outputs reported by the Commitments were presented (subchapter 3.3.1). The outputs concern various categories of achievements, such as patent applications, policy recommendations, roadmaps, research agendas, events/workshops, websites etc. These outputs address one or several EIP targets.

The Technology Readiness Level (TRL) achieved by the individual Commitments is discussed per selected categories in subchapter 3.3.2. The outputs reported by the Commitments have been verified to the extent possible.

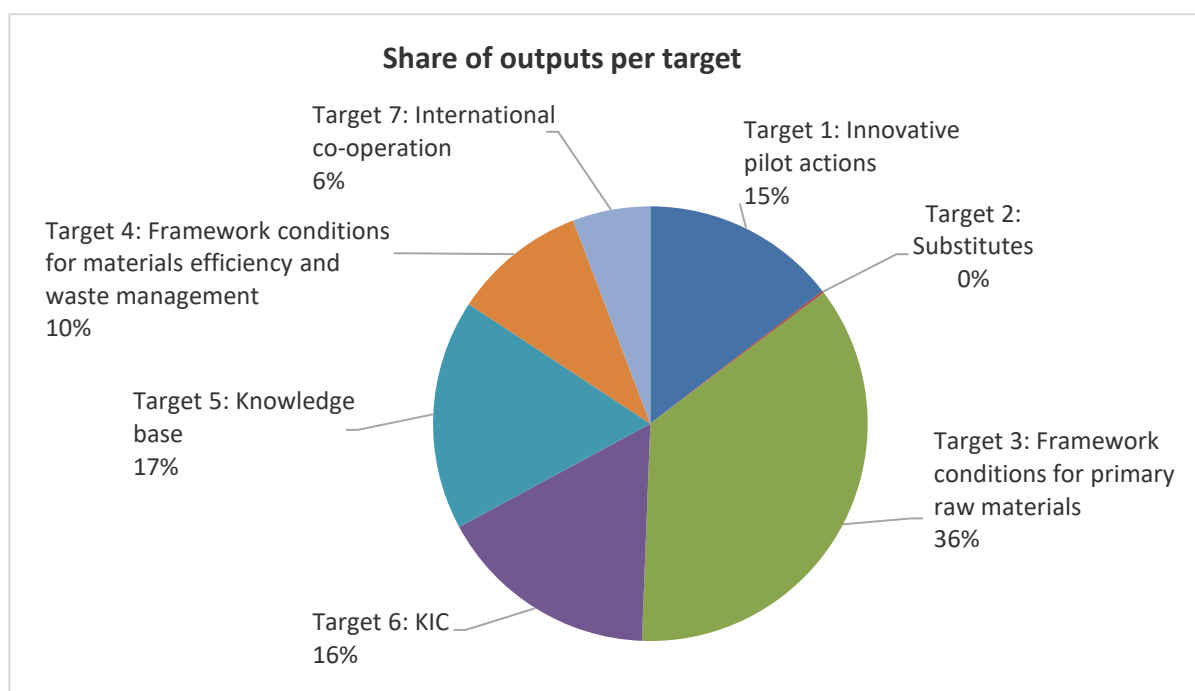
3.3.1 Summary of emergence of outputs

>> The largest share of the Commitments contribute to Target 3 Framework conditions for primary raw materials

As many as **14 EIP-RM Commitments** out of the 35 **reported to have achieved at least one output in 2020**. Many of them delivered outputs in several output categories.

Figure 9 presents an overview of **how these outputs in 2020 relate to the EIP targets**. Most commitments, as in AMR 2019, contributed to Target 3, (Framework conditions for primary raw materials) (36%). The share is followed by Target 5 (Knowledge base) (17%), and Target 6 (KIC) (16%). It is a different picture when compared to the AMR 2019, where Target 3 was followed by Target 4 (Framework conditions for materials efficiency and waste management) 22%, and Target 1 (Innovative pilot actions) by 22%. Outputs related to Target 7(international co-operation) and Target 2 (Substitution) remained relatively low.

Figure 9: Contribution to the EIP targets by the outputs delivered by EIP-RM Commitments reported for 2020²¹



Source: JRC analysis

>> Commitments continued to achieve outputs in category “innovative action or pilot on exploration, mining, processing and recycling for innovative production of raw materials”

Most outputs from category innovative action or pilot on exploration, mining, processing and recycling for innovative production of raw materials came from the sub-category **new technology/process/concept**.

The Commitments that have produced relevant outputs related to category **new technological processes** are the following:

- RMC NEXT has advanced their outputs in exploration technologies and data analysis methods, such as: SOM (self-organizing maps), a software extension for the prediction of lithologically-controlled tin mineralization, syringe pump prototype (operational). RMC NEXT has implemented the third generation of an electromagnetic receiver system, a new system architecture of the Satellite Image Crawler (SIC) and higher-level orchestration server and a newly developed electromagnetic (EM) software. RMC NEXT also developed a decision tree enabling to extract the complete list of minerals from the measurement of a sample using several field spectroscopic techniques.
- RMC C&D-WRAM has produced new concrete from construction and demolition waste (HISER and FISSAC project), new circular economy models related with Industrial Symbiosis, and industrial Symbiosis standard: Core Elements and Implementation Approaches
- RMC Mud2Metal developed a novel process for extracting Scandium from Bauxite Residue that has been demonstrated at industrial pilot level (TRL 5-6) up to a level which can be commercially exploited.

In the sub-category **new Product**, RMC SOLSA in drilling technology has created SOLSA MOBILAB, a trailer where all the analytical instruments have been mounted on silent blocks

²¹ The number of targets (here shown as %) is weighted by the number of targets quoted per RMC.

that suppress any vibration. In addition, all instruments are protected against dust, humidity and sealed against X-radiation.

Several other RMCs were involved in the **improvement of existing technologies**, such as RMC INCOMES with their recovery of refractory wastes and RMC SOLSA with the implementation of the SOLSA DRILL project. The SOLSA DRILL project enabled a discussion about the industrial needs related to, among others, monitoring, simulation models and design tools. RMC SOLSA has advanced identification prototypes in exploration technology.

In the **sub-category patent application**, RMC NEXT and RMC SOLSA reported to have patented their outputs; RMC Next (with RADA OY) for the EM system development and RMC SOLSA for apparatuses and methods for combined simultaneous analyses of materials and methods and system for materials characterization using multiple instruments and data fusion.

No outputs have been reported in the sub-categories **new services, new business model, Joint R&D category through pooling of competences/resources category** and **other output**.

>> Output related to alternative solution for critical raw materials

The only output from this category comes from RMC Mud2Metal feeding in sub-category **more resource-efficient use**. This activity addresses the use of Bauxite Residue (industrial residue, currently largely unused) as a source for production of a critical raw material (Scandium).

No outputs in the sub-category **substitution** for critical raw materials and **new product design** have been reported.

>> Several Commitments published strategic documents such as research agenda, guidelines/reference documents, methodology, labelling/certification, and policy recommendation

In sub-category **research agenda**, RMC EARTH 2020 delivered a Strategic Research & Innovation Agenda for Circular Economy including a Covid crisis impact assessment. Under sub-category **guidelines/reference document**, RMC NEXT has produced a research brief on the importance of exploration technologies, social and safety risks, early participation of civil society. RMC WRING contributed to this category with the publication of a reference document about best practices for wood waste management.

RMC WRING also produced outputs in sub-category **methodology**: Methodology for wood waste recovery, in sub-category **labelling/certification**, in measurement of furniture product circularity and **policy recommendation** about wood waste management.

No outputs have been produced regarding the **roadmap** and **voluntary code** categories.

>> Every second Commitment conducted knowledge sharing/dissemination activities. Many of them were held online due to the Covid-19 pandemic

In this section the outputs from category **knowledge sharing/dissemination of information and best practices** are reported by sub-category.

Various Commitments reported organizing **events, workshops or conferences** (excluding event etc. participation like conference papers and presentations). These include:

- RMC MIREU together with OECD organised a virtual discussion in June 2020 to explore the impacts of the coronavirus pandemic on mining regions and cities and the responses and opportunities emerging from this crisis in the short and long term. This virtual discussion served as a platform to exchange experiences and

best practices from OECD mining regions and cities in the context of the COVID-19 crisis.

- RMC NEXT was presented at several online events, such as GeoUtrecht 2020, EAGE Mineral Exploration Symposium 2020, EIT Raw Materials Summit, and PDAC 2021²² at EU booth.
- RMC EARTH 2020 - A lot of events related to CICERONE project were put in place in order to share the delivered Agenda and provide inputs for Circular Economy implementation, also including the critical role of raw materials in this process, for example at the International Workshop on Raw Materials in Circular Economy, Circle-In (Interreg project) web academy, Innovation Village 2020, Ecomondo 2020, Winter school KIC Raw Materials, Industria per un'economia circolare e pulita, and WCEF
- RMC WRING reported to have informed and involved Stakeholders of different EU areas in order to validate analysis of state of the art about wood management circularity.
- RMC C&D WRAM also reported to have held dissemination activities related to the projects HISER, FISSAC, PAPERCHAIN, RE4, and VEEP.
- RMC SOLSA had 40 presentations by the Consortium SOLSA in international conferences

The outputs under sub-category **information infrastructure / data base (including harmonisation and improvement)** are the following:

- Publicly accessible Knowledge Portal by RMC MIREU. The portal is intended to host and manage knowledge and data collected by the project. The knowledge portal allows consortium partners to enter data in the portal, to index it and describe its metadata, and allows end users to search and retrieve pertinent information in the portal.
- European Minerals Knowledge Data Platform (EU-MKDP) by RMC Euminet, which enabled access to all available and new data related to mineral resources through the 'Minerals4EU' Knowledge Data Platform.
- Open databases built on the COD format (Crystallographic Open Database) related to Raman, Hyperspectral, XRD and XRF technologies by RMC SOLSA.

In the sub-category **scientific publications**, the following RMCs delivered relevant outputs like reviewed scientific/technical articles:

- RMC SOLSA reported to have delivered as many as 26 scientific publications. In addition, 47 deliverables have been submitted to the European Commission portal and factsheets have been sent every 6 months to the Project Officer.
- RMC MIREU expected to produce at least four scientific publications in 2021.

Website

Several RMCs conducted knowledge sharing or dissemination of information by launching or advancing a dedicated **website**, for example RMC MIREU, RMC WRING, RMC ENSQM, and RMC SOLSA. These Commitments have an active website and have been regularly updating their sites with news, events, and reports. RMC MIREU is also available on several social media channels such as Twitter, LinkedIn, and Facebook. Via the website, RMC SOLSA provides access to the database of the SOLSA project.

RMC MIREU, RMC Euminet and RMC WRING communicated outputs in the sub-category **study/analysis/assessment** (publicly available):

- Under this sub-category, as many as 14 deliverables have been produced by RMC MIREU, expected to be available to public via Cordis.

²² Prospectors & Developers Association of Canada (PDAC) mineral exploration and mining convention, in Toronto, Canada 8-11 March 2021

- The study conducted by RMC Euminet identified a need for a harmonised tool for sustainable resource management in Europe, e.g. by applying The United Nations Framework Classification for Resources (UNFC) is a system that may be used for this purpose. In addition, a digital workshop where eight case studies on UNFC were presented and discussed.
- RMC WRING reported to have delivered a SWOT analysis of state of the art at European level for wood waste management, assessment of best practices.

RMC SOLSA has been actively involved in **education and training activities**. For instance, a collaboration with universities out of the Consortium to enlarge its expertise and give opportunities to students to train with SOLSA team. RMC SOLSA has also built a data architecture research group has been created at IBT, Vilnius. Twice a year RMC SOLSA organized the training MAUD (Materials Characterization by the Combined Analysis) at CNRS-CRISMAT and UNITN. SOLSA members also gave lectures at international Master and Bachelor levels in universities.

Moreover, several RMCs have been actively engaged in **stakeholder platform/institutionalized interaction/cooperation between different stakeholders** (broader than the partners):

- RMC MIREU has been in an active cooperation with OECD Mining regions and cities in projects related Smart Specialisation Platform (S3P) on Mining industries. RMC MIREU has also held discussions with Sudbury Mining Cluster about the possible cooperation with CoMMER.
- RMC EARTH 2020 has created Leadership groups in ECESP - SPIRE WGs.
- RMC Euminet -contributed to Raw Materials Information System (RMIS)²³.

>> Several Commitments were active in international cooperation

Under subcategory **event/workshop/conference organisation sub-category**, RMC MIREU with OECD Mining regions and cities have organized at least one virtual workshop in 2020.

RMC WRING has participated in **joint collaboration projects** - aimed at increasing the knowledge in wood-furniture sector.

Several Commitments conducted **education and training activities**, such as RMC-WRING with their participation in the definition of technical content for new courses and RMC-INTERMIN with the set-up of a global network of training centres in the raw material and the mapping of skills. .

No outputs were reported regarding sub-category **capacity building and technology exchange** activities.

In addition to the output categories already mentioned, RMC SUMAN 2000 was involved in biodiversity studies and social awareness-related projects. RMC pHMine was active in the field of soil stabilization via the Research and Development project at the Public University of Navarra.

3.3.2 Technology Readiness Level

The Commitments were asked to report the Technology Readiness Level (TRL), which specify the maturity of technologies/projects developed in the course of Commitments. The TRL was applicable for "Innovative action or pilot on exploration, mining, processing and recycling for innovative production of raw materials" and "Alternative solution for Critical

²³ <https://rmis.jrc.ec.europa.eu/>

Raw Materials” category. The Commitments self-assessed the TRL level that has been achieved at the time of filling the survey (early 2021) according to the nine levels of TRL:

- TRL 1 – Basic principles observed
- TRL 2 – Technology concept formulated
- TRL 3 – Experimental proof of concept
- TRL 4 – Technology validated in lab
- TRL 5 – Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 6 – Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 7 – System prototype demonstration in operational environment
- TRL 8 – System complete and qualified
- TRL 9 – Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

Regarding outputs that belong to **Innovative action or pilot on exploration, mining, processing and recycling for innovative production of raw materials**, RMC C&D-WRAM reported **new products** that have reached TRL 7. These products are new CSA and Blended concrete. SOLSA MOBILAB by RMC SOLSA is another example from new product category. SOLSA MOBILAB is a mobile trailer where all the analytical instruments have been installed and protected against dust, humidity, and where the supporting devices are sealed against X-radiation. This technology has overcome problems against vibration as detected in previous performance tests and it has been demonstrated in relevant environment (TRL 6). Under **new process sub-category**, RMC Mud2Metal developed a novel process that has been demonstrated at industrial pilot level (TRL 5-6) for extracting scandium from bauxite residue. Under the **improvement of existing technologies**, RMC INCOMES has developed technology for recovery of refractory wastes that has reportedly been proven in operational environment (TRL 9). RMC SOLSA with SOLSA DRILL and SOLSA IDENTIFICATION system in drilling technology have demonstrated this technology in relevant environment (TRL 6).

RMC Mud2Metal that focused on **alternative solution for Critical Raw Materials** reported an output that has been demonstrated in relevant environment (TRL 6). RMC Mud2Metal promoted the use of bauxite residue, largely unused currently, as a source for production of a critical raw material (scandium).

3.4 Future Plans for 2021

Many of the Commitments have been executing or even finishing their implementation phase, accompanied by coordination or dissemination activities. The most common activities of the Commitments include the execution of funded projects, continuous support of commitment ideas and goals (with or without relation to funded projects), participation in thematic discourse and discussions, dissemination, and search for new funding opportunities, while research and development in the narrower sense is diminishing.

The mandate of the EIP on Raw Materials finished at the end of 2020. Nevertheless, the Commitments are often embedded in specific plans of the consortia and its members that form the Commitment. Accordingly, some Commitments continue to have various future plans corresponding to the differing degrees of Commitment maturity.

Some of the commitments expressed that the original plans, including some key deliverables, were delayed due to the Covid-19 pandemic situation. Consortium partner countries have applied restrictions to people’s movement, and as a consequence remote working, meetings in digital formats, and other exceptional practices, including restrictions to travelling, have been in place. Field tests had to be postponed due to travel restrictions. Although the Covid-19 measures were modified over time, they will continue in one or the

other form for the time being. As an example, RMC NEXT applied for 5-month extension to the project until end of September 2021, which was approved by EASME in February 2021.

>> *Execution of funded projects*

Commitments that obtained funding through successful applications continue the execution of funded projects also beyond the end of 2020.

RMC Mud2Metal expects to finalize and assess the results of the H2020 SCALE project for Sc extraction from bauxite residues. In order to reach this, it will continue and start the demonstration of technologies for processing bauxite residues in the scope of the REMOVAL and ENSUREAL H2020 projects, focusing on pyrometallurgical processing of such residues for base metal (Fe, Al) production as well as in developing products. RMC Mud2Metal shall then start the H2020 project REACTIV focusing on transforming bauxite residues into a supplementary cement-like material.

RMC INTERMIN continues to support the Commitment network by completing the INTERMIN Online Educational Platform by a portal user manual (<https://portal.interminproject.org>), preparing the Sustainability and Strategic Plans of the international network, as well as the Action Plan to close skill gaps and enhance existing education. Further, RMC INTERMIN plans to include the elaboration of the joint training programmes for the raw materials sector, the signature of cooperation agreements, the preparation and collection of various communication materials and a Networking Map.

RMC WRING will advance its steps to identify best practices about reuse, recovery and recycling of wood at EU level. It will support the implementation of circular economy solutions for wood and furniture. It applies LCA for developing best cases of wood waste management in Europe. Further, RMC WRING shall implement circularity certifications for furniture. Some of these activities will continue at least until the end of 2021 by the individual partners and could partly be extended beyond within the framework of the H2020 projects *WoodCircus* and *Ecobulk*, as well as within the innovation network *InnovaWood*²⁴, an umbrella organisation that integrates four European networks in the Forest, Wood-based and Furniture industries.

RMC NEXT will finish in 2021 its developments of the Geologic and 3D ore system models for exploration, a fully drone-based electromagnetic survey system, and a versatile drone-based vector magnetic system. It will formulate recommendations and best practices for the use of tested surface geochemical sampling media and specify the reduction of exploration costs as well as implied changes in the estimation of mineral resources and ore reserves. In addition, RMC NEXT will publish a brief on the importance of exploration technologies, social and safety risks, and the early participation of civil society in this process. Finally, the results will be made available by a “practical NEXT toolkit” for application by exploration and mining companies.

>> *Thematic Discourse and Discussions*

Several **network and co-ordination Commitments** advanced further their activities and plan to finalise those activities through 2021 that are still pending.

RMC EARTH 2020 is going to continue to strengthen the integration of raw materials related initiatives to support the circular economy activities, as in the previous two-year period, in particular with a territorial approach.

Furthermore, in the context of circular economy activities, the Interreg project coordinated by ENEA was approved on Bio Blue Technologies. It is foreseen to establish interaction as a potential future EIT thematic area in the water, marine and maritime EIT (action plan 2021-2027).

²⁴ <http://www.innovawood.com/>

RMC ENSQM discussed at its consortium meeting the organisation of a further stakeholder workshop in a priority country in 2021, including determining the arrangement of the precise modalities.

RMC ZeroWaste-NOI plans further uptake of the Commitment partnership by the EIT on Raw Materials.

RMC SUMAN 2000 prepares the cooperation at national level with the Spanish mining associations²⁵ COMINROC²⁶, CONFEDEM²⁷ and PRIMIGEA²⁸, for example by the mining and life "Comprehensive campaign for education, image and dissemination of the extractive industry and the mineral raw materials industry" as well as by various biodiversity studies related to mining activities.

>> *Dissemination and Promotion*

The Commitments will also in 2021 make use of various events to strengthen the Commitment and project related cooperation and dissemination.

As the H2020 project MIREU ended by April 2021, the related dissemination activities of **RMC MIREU** intensified significantly. The MIREU project final event was organised in April 2021. At the event, the essential points learned during the project were presented. CoMMER, the Council of Mining and Metallurgy European Regions, was launched as a new form of collaboration both in Europe and globally. CoMMER is the main output of the MIREU project. It is a permanent meeting point for all regional stakeholders with interest in mining, metallurgy, raw materials and sustainability (political and administrative bodies, research organisations, clusters, universities, development agencies, mining companies, SMEs, non-governmental organisations). Utilising the already existing regional network of MIREU partner ERRIN (European Regions Research and Innovation Network), CoMMER will form part of an ERRIN Task Force on Raw Materials, which will support the longevity of the initiative. The permanent interregional ERRIN network and its raw materials-focused task force welcome new members to join. At the final MIREU project event, the ideas behind CoMMER are presented, and the role of the regional ecosystems in the development of responsible and sustainable mining in the EU green and digital transition are discussed.

Beyond, MIREU will during 2021 advance further activities. Prominent examples comprise e.g. 1) engaging a representative number of mining and metallurgy regions for the CoMMER network, by keeping the already engaged regions committed throughout the project and attracting new regions to take part in the network activities; 2) determining the framework conditions that are either conducive or hampering mining and metallurgical development in Europe, by reviewing the regulatory and policy conditions and adding suggestions for improvement, and assessing the skill requirements and investment conditions; 3) publishing the EU SLO Guidelines and Toolbox by engaging a wide range of stakeholders to discuss the aspects of SLO and benchmarking the EU SLO guidelines and toolbox to international level; 4) promoting regional synergies for economic growth, by reviewing the Smart Specialisation strategies of the regions and carrying out a "regional mirroring" strategy across the MIREU regions with the aim of informing public authority decision makers and regional strategic plans, producing a roadmap for actions targeting the creation of new business opportunities and economic growth; 5) raising awareness of citizens on the importance of mining and metallurgy, by targeting the communication and dissemination activities to different stakeholder groups and regions and offering fact-based information about all aspects of the mining and metallurgical industry.

²⁵ <https://atalayar.com/content/nace-primigea-la-asociaci%C3%B3n-espa%C3%B1ola-de-las-industrias-de-las-materias-primas-minerales>

²⁶ La Confederación Española de Industrias Extractivas de Rocas y Minerales Industriales, <https://www.cominroc.es/>

²⁷ Confederación Nacional de Empresarios de la Minería y de la Metalurgia, <http://confedem.com/>

²⁸ Confederación Española de las Industrias de las Materias Primas Minerales, <https://www.obrasurbanas.es/nace-primigea/>

RMC WRING will disseminate previous results and foster the assessment of public and industrial needs in the field of wood processing and recycling. To support this, it will organize key events, such as workshops and focus groups, and involve actively European stakeholders through communication and dissemination activities.

Also, **RMC INTERMIN** enforced the dissemination activities due to the cessation of the INTERMIN project. The final project report shall be published, and the project results are presented at the PDCA 2021 and the EGU2021 conference in 2021.

RMC SUMAN 2000 disseminated its results by the mining and life campaign named "Comprehensive campaign for education, image and dissemination of the extractive industry and the mineral raw materials industry".

>> Research and Development

Based on results from advancing and consolidating various technologies and techniques related to the exploration and the analysis of diverse mineral deposit types, **RMC NEXT** will support its R&D activities by a brief on the importance of exploration technologies, social and safety risks, and early participation of civil society.. In addition, RMC NEXT shall also design a practical NEXT SLE toolkit for exploration and mining companies.

RMC INCOMES will extend its R&D actions by probing magnesite mining waste.

By means of an R&D project on "artificial soils", **RMC phMINE** is going to explore the recovery of soils altered by mining activities.

Annex 1. Number of Raw Material Commitments contributing to each Action Area²⁹

Pillar	SIP Action Area	Coverage
Technology	I.1 Improving R&D&I coordination in the EU	26
	I.2: Exploration	15
	I.3: Innovative extraction of raw materials	30
	I.4: Processing and refining of raw materials	23
	I.5: Recycling raw materials from products, buildings	28
	I.6: Materials for green technologies	6
	I.7: Materials for electronic devices	3
	I.8: Materials under extreme conditions	6
	I.9: Applications using materials in large quantities	4
Non-Technology	II.1: Minerals Policy Framework	39
	II.2: Access to Mineral Potential in the EU	18
	II.3: Public Awareness, Acceptance and Trust	23
	II.4: Product design/optimised use/increased recycling	12
	II.5: Optimised waste flows for increased recycling	18
	II.6: Prevention of illegal shipments of waste	4
	II.7: Optimised material recovery	21
	II.8: EU Raw Materials Knowledge Base	16
	II.9: Possible EIT Knowledge & Innovation Community	4
	II.10: Optimised materials flows along value chains	21
International Cooperation	III.1: Technology	23
	III.2: Global Raw Materials Governance / Dialogues	5
	III.3: Health, Safety and Environment	12
	III.4: Skills, Education and Knowledge	15
	III.5: Investment activities	4

Source: JRC analysis

²⁹ This table summarises the results from the AMR Surveys 2015 to 2020. The colour coding relates to the coverage of the Action Areas divided into 4 tiers, from high coverage (dark green) to low coverage (light green). Following changes in the specification by some Commitments, the table shows slightly altered coverage numbers. As these changes were minor, the colour codings did not change for any Action Area.

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