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European Innovation Partnership on Raw Materials

*Annual Monitoring Report
2017*

2018



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¹ <https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/content/eip-raw-materials-monitoring-and-evaluation-scheme>

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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
WEEE	Waste electrical and electronic equipment

Executive Summary

Based on a survey launched in early-2018 for the year 2017, this Annual Monitoring Report 2017 provides an overview on the **state-of-play of Raw Material Commitments (RMCs) of the European Innovation Partnership on Raw Materials (EIP-RM)**. Commitments are joint undertakings by several partners, who commit themselves to carrying out activities that contribute to achieving actions and targets of the EIP-RM.

KEY DATA ON THE COMMITMENTS ACTIVE IN 2018

In early-2018, the EIP-RM counted 60 Commitments, 27 from the 2013 Call for Commitments, and 33 from the 2015 Call for Commitments. So far, **the Commitments had covered all Priority Areas of the EIP-RM in a relatively balanced way**, even though the 2015 Call for Commitments attracted very little Commitments on framework conditions for waste management. However, the completion of several Commitments, and also disqualifications, progressively led to an imbalance. The number of active Commitments on 'Raw materials research and innovation coordination' and on 'Improving Europe's raw materials framework conditions' decreased significantly.

To date **the EIP-RM counts around 650 unique partners**, including 45 partners from non-EU countries. Overall, Spain remains the best represented country in EIP Commitments, followed by Italy with about 70 unique partner organisations.

Taken together, the Commitments have reported a **total indicative budget of €1979 million**.

FUNDING

The Commitments are increasingly successful in securing their budgets, reaching a level of 29% in 2017 (compared to 25% in 2016, 23% in 2015, and 15% in 2014). The share of the funding secured from the **EU increased over time and reached now more than three quarter** (€246 million equals 78% of the total secured funding), mostly through Horizon 2020. **Alternative EU funding sources** such as the European Investment Bank, the European Development Fund and Cohesion Policy Funds account for a **very small fraction** of funding to the Commitments. Since 2014 the RMCs have received **€90 million from 16 different countries**, while 13 Member States **appear to have not provided any public or regional funding** to the EIP Commitments since 2014. Finally, in 2017, 4 RMCs secured **private funding** worth more than 6 million. The total number of Commitments having received private funding since 2014 stays 61, totalling now **€122 million**.

ACTIVITIES

With few exceptions, all the active Commitments reported to have undertaken activities towards their objectives since 2014. Commonly reported activities are of an **organisational nature**, such as enlarging their partnership, securing funding, and profiling. Increasingly, implementation of the Commitments is in the focus, in particular **research and dissemination** activities.

OUTPUTS

Many Commitments are delivering tangible outputs. Most outputs contributed to **Target 6** on KIC, followed by **Target 3** (Framework conditions for primary raw materials) and **Target 4** (framework conditions for materials efficiency and waste management). Few outputs contributed to **Target 2** (Substitutes). Examples of outputs delivered by the Commitments are **knowledge sharing outputs** (publications, events, websites etc.), **innovative actions or pilots** (technological processes, new business models, new products etc.), and **international cooperation** (sharing/dissemination of information and

best practices, participation in joint collaboration projects, event/workshop/conference organisation, technology exchange, etc.).

UN SUSTAINABLE DEVELOPMENT GOALS

In order to follow-up on contributions in the raw materials sector to the 17 Sustainable Development Goals (SDG) adopted in 2015 by the UN General Assembly, the Annual Monitoring Report 2016 demonstrated for the first time to what extent the UN Sustainable Development Goals have been addressed by the activities of the diverse RMCs. The Annual Monitoring Report of this year refines and updates that analysis, showing for each of the 17 SDG, how many individual Commitments address the related targets.

The survey identified more than 230 linkages based on the responses of the Annual Monitoring Report 2016 and 2017 responses. The analysis of the AMR 2017 confirmed that all the 17 SDGs are addressed by the activities of the Commitments. The focus of the EIP-RM Commitments is concentrated on the following Sustainable Development Goals:

- Ensure sustainable consumption and production patterns (SDG 12)
- Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (SDG 8)
- Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation (SDG 9)

Further SDGs frequently addressed by Commitments are:

- Strengthen the means of implementation and revitalize the global partnership for sustainable development (SDG17)
- Ensure availability and sustainable management of water and sanitation for all (SDG6)
- Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss (SDG15)
- Make cities and human settlements inclusive, safe, resilient and sustainable (SDG11)

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

Table 1: Key performance indicators (December 2017) for Raw Material Commitments (RMC)

Key performance indicator	2013 Call for Commitments	2015 Update on RMCs from 2013	2015 Call for Commitments	2016 Update on RMCs from 2013 /2015	2017 Update on RMCs from 2013 /2015	Total
Number of commitments	80	- 4	+ 47	-24	-39	60
Number of unique partners	699	+ 56	+ 223	-125	-210	643
Total indicative budget	€1744 million	- €58.4 million	+ €294 million	n.a.	n.a.	€1979 million
Budget secured ²	€268 million	+ €123 million	n.a.	+ €113 million	+ €70 million	€574 million
Share of indicative budget secured	15%	23%	n.a.	n.a.	25%	29%
Outputs, cumulative	ca. 200	ca. 500	n.a.	ca. 900	ca. 1300	

Source: JRC analysis

² 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).

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)**³ 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**⁴ to Member States, industry, academia and other relevant stakeholders in October 2013 and December 2015, and opened a third and last **Call for Commitments** in late spring 2018. 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.

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 RMCs' inputs and outputs. The data used come from the information provided during the Calls for Commitments and from the **mandatory annual AMR surveys**. The results of this monitoring exercise will feed into the SIP Implementation Document and the Strategic Evaluation Report⁵.

³ <https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/content/strategic-implementation-plan-sip-0>

⁴ <https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/call-commitments>

⁵ See the EIP Monitoring and Evaluation scheme: <https://ec.europa.eu/eip/raw-materials/en/content/eip-raw-materials-monitoring-and-evaluation-scheme>

2 Overview of the Commitments

The EIP-RM organised **two Calls for Commitments**, in **2013** and **2015**, and opened a third and last **Call for Commitments** in late spring 2018. From the 2013 Call for Commitments the EIP Sherpa Group accepted **80** Commitments, while the 2015 Call led to **47** additional Commitments.

Commitments that do not fill in the annual monitoring survey for two consecutive years lose their recognition as a Raw Materials Commitment. In 2017 this was the case for 35 Commitments⁶. Moreover, 10 Commitments⁷ finished in the meanwhile, 6 in 2016 and 4 in 2017. This way the EIP counts **60 Commitments** at the beginning of 2018. This means that the overall decrease doubled, from 22 in 2016 to 45 in 2017.

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

Further details on all of the endorsed Commitments can be found on the EIP website: <https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/call-commitments>

2.1 Commitments and coverage of the SIP

>> The coverage of the different Priority Areas is relatively balanced

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

From the beginning, all Priority Areas were relatively well covered, taking into account that some Priority Areas (e.g. 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 cessation of several Commitments causes a significant drop in the total number of recognised Commitments, which is intensified for the single priority areas due to statistical reasons. In the AMR 2017 Survey, 47 RMCs responded; a response rate of 47 %.

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.

⁶ ALBATROSS, BRAVO, BRIO, BRITE, BULKY, CARBOCYCLE, Covenant2022, CYCLEFIBER, ECAMOB, EESC IR, EHI, ENTRIE, ERDEM, ETP-PRIME, ExplOre, HOPE40, InPhosphoChlor, LiDEP, Metallica, NATREG, NewEco, OPTIMIN 2020, ORAMA, PREVENTILEX, REDEPO, REFLEX, REMIND, ROSE, RUBICON, Safe & Prod. Mining Waste, SecPRIME, SMALLMINE, SWEETSTOCK, WEEE + BATT Excellence, WEMINEIT.

⁷ Finished in 2016: Blue Atlantis, CRM Innonet, ERA-MIN, I²Mine, I²Mine-pilot, PLATINUM; finished in 2017: ELTSTANDARD, Mineland, MIREU, Taurus

Table 2: Number of RMCs covering each Priority Area in 2017. The Commitments that responded to the AMR 2017 Survey are put in bold, those that finished in 2017 and/or lost their recognition are in *italics* (number indicated in brackets).

Priority Area or theme	Relevant Raw Materials Commitments	Number of RMCs
Priority Area I.A. 'Raw materials research and innovation coordination'	<i>ETP-PRIME</i>	1 (1)
Priority Area I.B. 'Technologies for primary and secondary raw materials production'	BioMOre, EUROASSET, ExECRoMe, ExplOre, NEXT, RUBICON, SecPRIME, SIMS, SmartExploration, SOcRATES, SOLSA	11 (3)
>> Land mining (exploration/mining)		
>> Deep sea mining (exploration/mining)	<i>ALBATROSS, Blue Nodules, ERDEM</i>	3 (2)
>> Processing	BioAlMinore, BioIron, BRAVO, BRIO, CuBES, EHI, EUROPEM, INCOMES, InPhosphoChlor, LiDEP, MetGrow, Mud2Metal, NewEco, PolymetOre, REDEPO, REFLEX, SMALLMINE	17 (9)
>> Waste management	BULKY, C&D-WRAM, CYCLEFIBER, EARTH 2020, ENCRAM, EURELCO, HOPE-4-0, HydroWEEE, ITERAMS, pHMine, Reclaim, ROSE, TailingsDamScavenger, WeCARE, ZeroWaste-NoI	15 (4)
Priority Area I.C. 'Substitution of raw materials'	CARBOCYCLE, EQUATOR, EU-NARS-G, RAW-NANOVALUE, RESET, SUBST-EXTREME	6 (1)
Priority Area II.A. 'Improving Europe's raw materials framework conditions'	BioDIMA, EESC IR, EMD, ENSQM, ENTRIE, Mineland, MIREU, NATREG, OPTIMIN 2020, Safe & Prod. Mining Waste, SAFEMIN, Stand4Mines, SUMAN2000, SUSMINE, SustainableMiningStandard, WEMINEIT	16 (8)
Priority Area II.B. 'Improving Europe's waste management framework conditions and excellence'	Covenant2022, CRM Recovery, ELTSTANDARD, EPR-C Commitment, IMPACT, PREVENTILEX, WEEE + BATT Excellence	7 (4)
Priority Area II.C. 'Knowledge, skills and raw materials flows'	BRITE, CRAM, EUMINET, NATUREUROSTONES, ORAMA, REMIND, TAURUS, WEEE 2020	8 (4)
Priority Area III. 'International cooperation'	IMAGINE, INTERMIN, InTrain4RM, Metallica, MINSPIRE	5 (1)
Biotic materials	ECAMOB, Effiwood, EHIA, GENTLE, NOWMOB, PROFIBRE, RUBB-ENDURE, RUBBERTOMARKET, SWEETSTOCK, WRING	10 (2)

Source: JRC analysis

2.2 Partners

>> *The EIP on Raw Materials counts 650 unique partners*

In 2013, about 700 unique partners related to 80 commitments belonged to the EIP-RM⁸. Between 2013 and 2015, one third of these RMCs reported through the AMR 2015 Survey an evolution of their partnership. In spite of the disqualification of four RMCs and the consequential loss of 27 partners, the EIP-RM showed a net increase by 56 new unique partners. Moreover, the 2015 Call for Commitments attracted another 223 unique partners, related to 47 commitments, bringing the overall EIP partnership to a peak of about 980 unique partners.

The 2016 AMR survey resulted in the disqualification of 5 RMCs and a consequential reduction of 27 partners. In addition, 13 RMCs finished in 2016, resulting in a decrease of a further 141 partners. The evolution in the partnerships of the remaining RMCs caused the leaving of 4 extra partners, and an entering of 46 partners. The **overall EIP partnership** thus decreased in 2016 by 126 partners to about **850 unique partners**.

This trend continued since then. The 2017 AMR substantiated in the disqualification of 35 RMCs with a subsequent reduction of 366 partners. Further, 10 RMCs finished since the AMR2016, thus leading to a decrease of additional 46 partners by the end of 2017. As a consequence, the **overall EIP partnership** thus in 2017 decreased significantly by 200 partners to about **650 unique partners**.

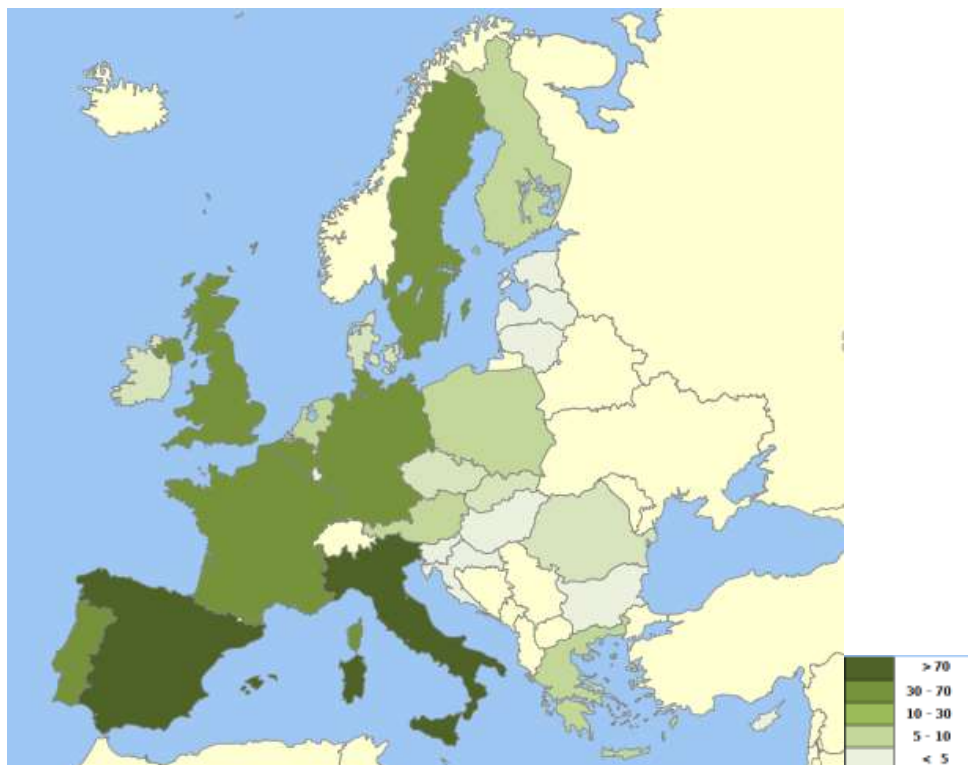
>> *Member State participation remains uneven, even after the 2015 Call for Commitments*

Figure 1 presents the distribution of the **unique partners per Member State**. Overall, **Spain** remains further the best represented in the EIP Commitments (more than 100 different partner organisations), followed by **Italy** with almost 75 unique partner organisations. Further countries with good representation in the RMCs are Germany, France and Belgium with circa 45 unique partner organisations. For most countries, the number of unique partners decreased significantly, in average about one third. This applies also to the **partners from non-EU countries⁹, which count in 45 partners**.

⁸ The 80 commitments are the ones accepted after the 2013 Call for Commitments.

⁹ Countries with more than three different unique partners include Brazil, Chile, Norway Serbia, Switzerland, Turkey, and the United States.

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



Source: JRC analysis

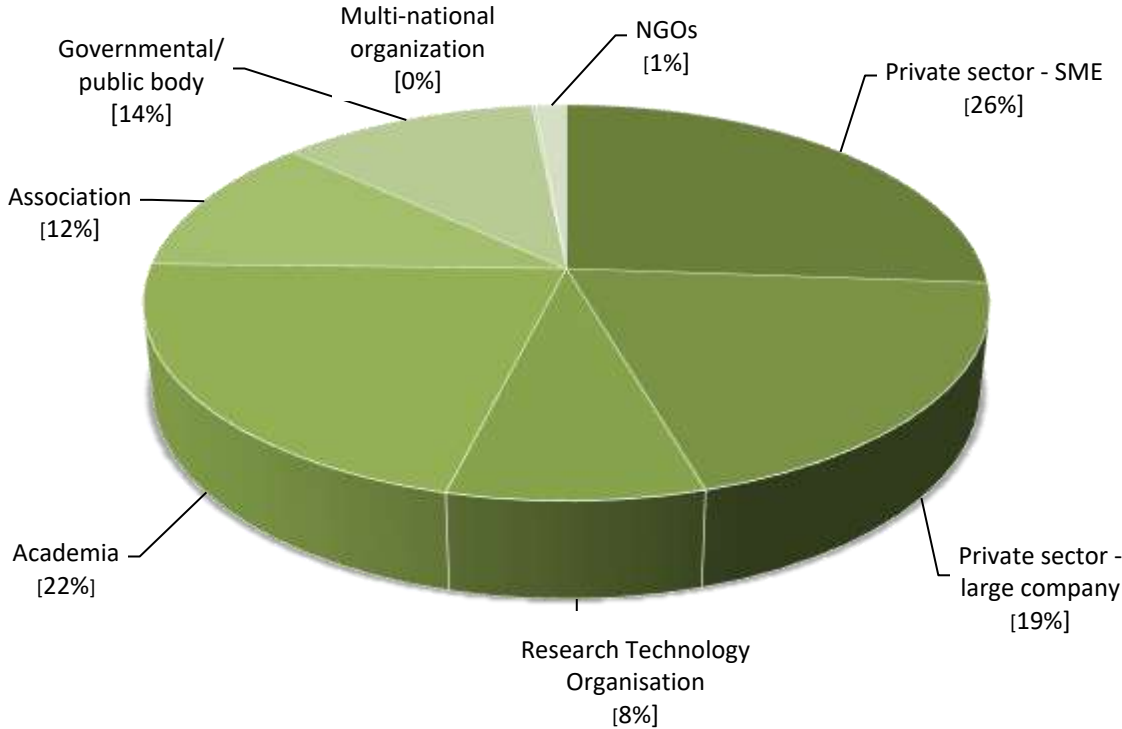
Spain (11), Italy (7), Finland (5), and France (5) are well represented also in **RMC leadership**, with pan-European organisations (13) also leading a significant number of RMCs.

>> There is a balanced participation from 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 is relatively evenly balanced between the public and private sectors**. Almost half (45%) of the organisations that participate in Commitments come from the private sector, both large companies and small and medium-sized enterprises (SMEs); the latter representing over one quarter (26 %) of all organisations that participate in Commitments. In addition, associations representing the private and non-private sector make account for around 12 %.

Interestingly, the distribution by type of RMC partners is very stable: After very modest changes between 2014 and 2015, there are only very minor changes since then.

Figure 2: Type of RMC partners, in %



Source: JRC analysis

2.3 Funding¹⁰

>> *Under the EIP on Raw Materials, public and private sectors could co-fund close to €2 billion of activities*

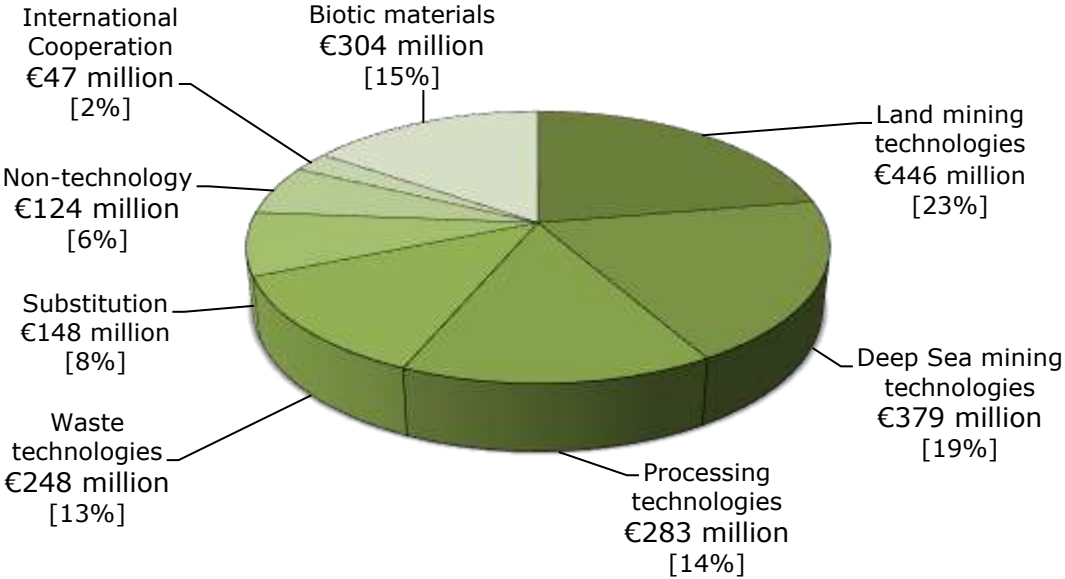
The participation of the Commitments to the EIP is a voluntary process, with **no direct EU funding awarded** to the endorsed RMCs. However, **the EIP plays an important role in bringing together stakeholders** that may have easier access to financing together than taken alone when applying for EU Horizon 2020 funding, as well as other EU funding sources such as LIFE funding, Cohesion funding, European Investment Bank loans, etc.

Commitments provided an estimate of their **total indicative budgets** as part of their submission to the Call for Commitment (CfC), both at CfC 2013 and CfC 2015. Indicative budgets for the 76 currently active RMCs from the CfC **2013** amount to **€1685 million**. The RMCs from the CfC 2015 however provided more conservative indicative budgets, adding only **€294 million, resulting in a total indicative budget that reaches €1979 million**.

As shown in **Figure 3, the technology-focused Commitments make up the largest proportion of the overall total indicative budgets**. With lower rates of projected capital outlay and overall cost, non-technology and international cooperation themed RMCs collectively account for only 9% of total indicative RMC budgets.

¹⁰ As the AMR 2016 Survey did not provide information on the indicative budget, which would allow an update of this subchapter, this chapter is maintained in the version of last year to ensure continuity in reporting.

Figure 3: Overall total indicative budget of the RMCs by theme, in € million and %



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**. About half of the Commitments responded to the AMR 2017 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

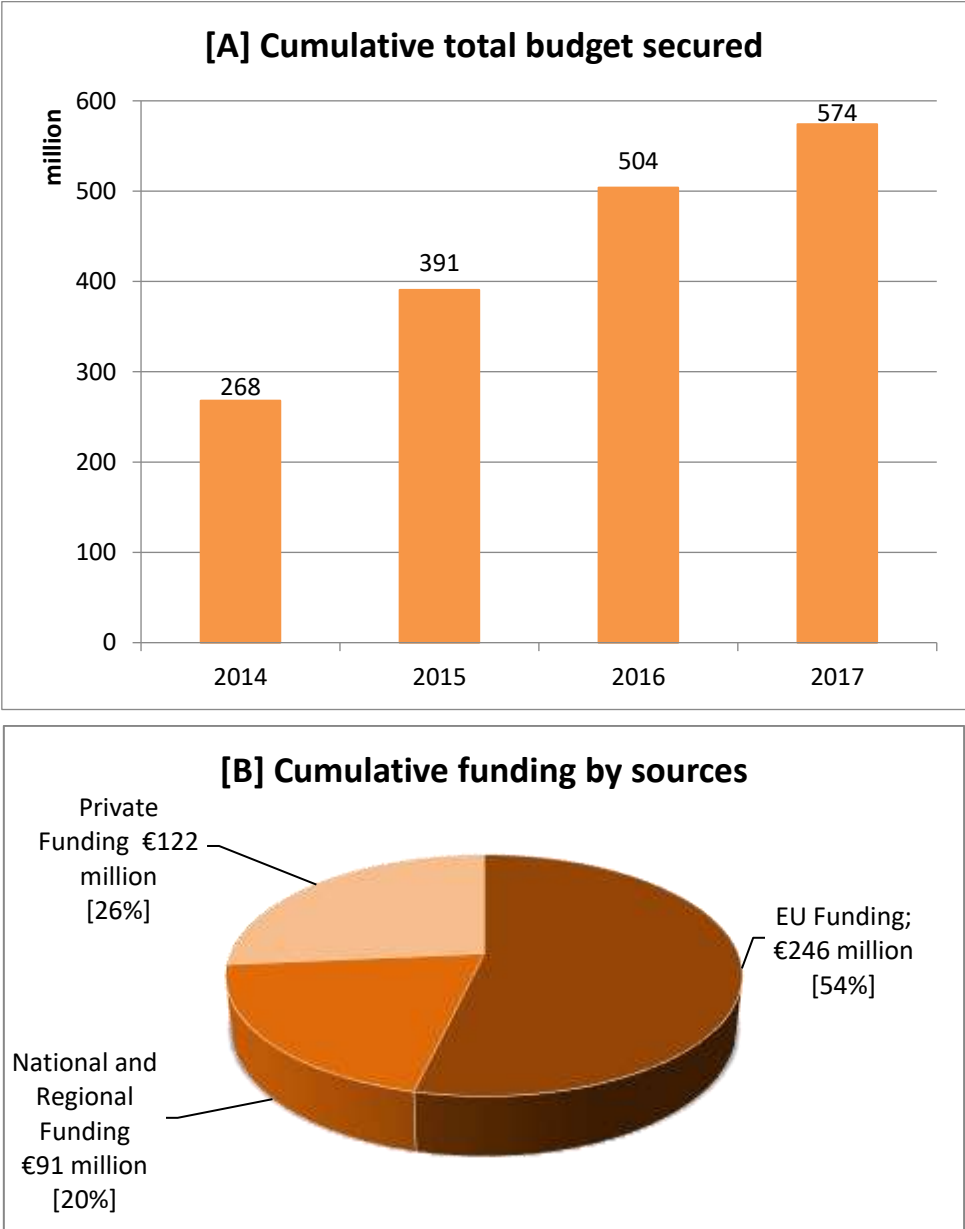
>> On average the RMCs have now secured almost 30% of their total indicative budgets

Prior to the Annual Monitoring Report 2017 Survey, RMCs had reported the securing of €504 million¹¹. **At the time of the Annual Monitoring Report 2017 Survey, the RMCs reported to have further secured €70 million**. This means that the EIP Commitments have now secured approximately **€574 million** out of the updated total indicative budget of €1979 million, or **29%** of their total indicative budgets (compared to 15 % in 2014, 23 % in 2015, and 25 % in 2016).

The **trend of the total budget secured**, cumulative for the years 2014, 2015, 2016 and 2017, is summarised in **Figure 4A**, while the reported budget secured for the period 2014-2016 is shown by type of resources in **Figure 4B**.

¹¹ 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 2017, in €; [B] Cumulative budget secured split by type of sources since 2014, in € million and %¹²



Source: JRC analysis

The **cumulative total budget secured grew rather evenly** over the period 2014-2017, starting from a total budget of €268 million and reaching now €574 million. The absolute increase is significantly slowing down, especially in 2017. The increase has more than halved in the period 2014-2017.

Since 2014, the largest proportion of funding comes from the EU; for the period 2014-2017 the EU funding amounts to more than half of the total (**54%**), equivalent to

¹² 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.

€246 million. Private funding of €122 million represents about a quarter (26%) of the total funding secured since 2014. Funding from public national and regional sources is more than €90 million over the same period, representing about a fifth (20%). There is an overall trend that the share of the EU funding increases, whereat the private funding decreases. This is clearly visible for the funding secured in the year 2017, whereat the EU funding exceeded three quarter of the overall budget secured while the share of the private funding dropped below 10%.

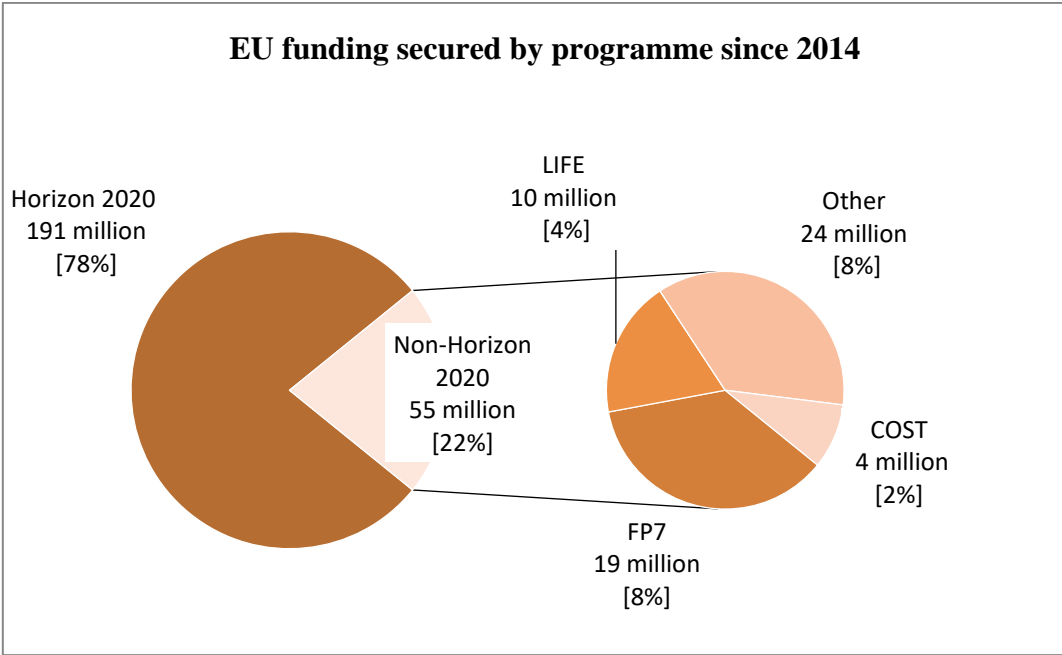
EU Funding

>> *The Horizon 2020 programme has become clearly the biggest source of EU funding for RMCs, worth €191 million*

In 2017, 10 RMCs reported securing about €55 million of additional EU funding. This brings EU funding to €246 million since 2014, shared among more than 30 Commitments.

The **Horizon 2020** research and innovation funding programme stays clearly the **biggest source of EU funding** that Commitments received (84% of the total in 2017, compared to 95% in 2016, 87% in 2015, and 11% in 2014) (**Figure 5**). More than 30 RMCs are receiving funds through this programme. The **FP7** research and innovation funding programme is the second largest EU funding source for EIP Commitments since 2014, with about 8% of the total, followed by **LIFE with about 4%** of the total.

Figure 5: Type of EU funding received by EIP Commitments since 2014, in € million and %. 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 RawMaterials is a significant source of EU funding*

It is notable that 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**. As of 2017, the **EIT on Raw Materials**

appears as a steadily growing source of funds, contributing now with approximately €15 million (compared to 13 million in 2016 and €0.75 million in 2015) in RMCs for the BioFlex, SolvoFlex, Electroflex, Pyroflex, Residuflex, Preflex, SSIC, ERMAT, GATEWAY and Metnet, PilotMet KAVA Networks of Infrastructures, and newly also for projects AMCO, SUPRIM, Mineral products from Petrit-T sidestream, and HARSHWORK.

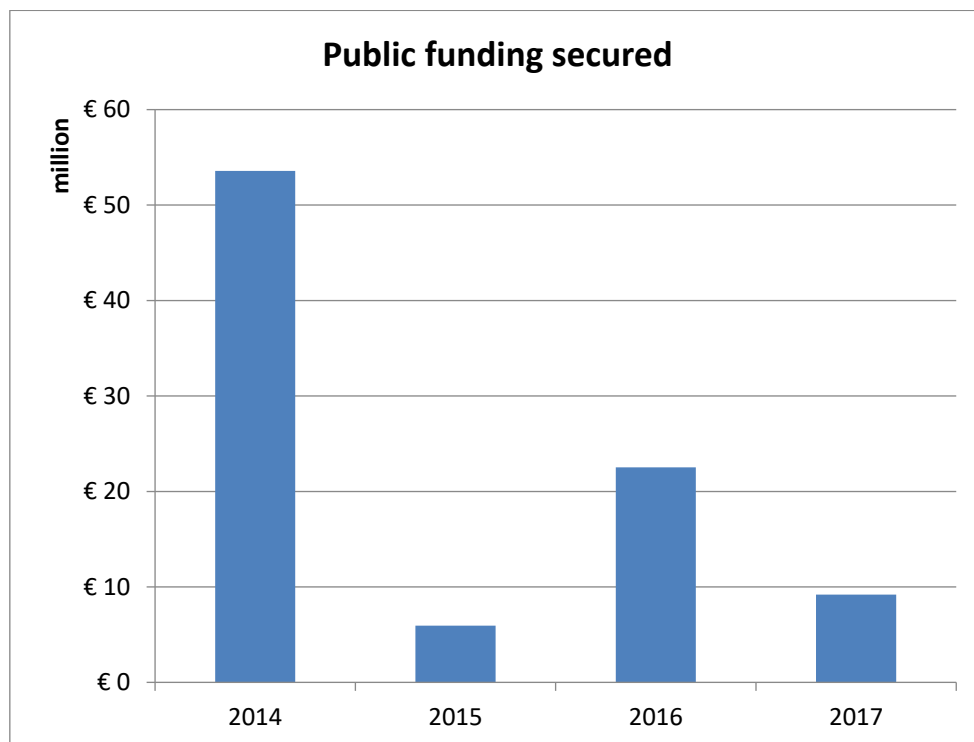
Public National/Regional Funding

>> Since 2014 the RMCs have received more than €90 million; the fluctuation of the reported volumes of national or regional funding is significant

In 2017, **7 RMCs received direct funding or in-kind contributions from public or regional bodies** across Europe and internationally (compared to 14 RMCs in 2016). As a consequence, also the volume of the national or regional funding more than halved and thus **accounted for about €9 million from 7 countries. Belgium** provided the biggest contribution from public or regional bodies (€4.0 million) followed by **Finland**. Due to the significant decrease of the overall volume, the relative share of Belgium more than doubled and now accounts for almost 45 %. The countries following Belgium are **Finland** and **France** (both €2.0 million), **Sweden** (€0.8 million), the Netherlands (€0.3 million), and Portugal (€0.2 million). In comparison with the other countries, the contribution by **Spain** is minor (€0.02 million). The NOWMOB Commitment lost its dominating position, now the most relevant project became EURELCO, which is solely funded by Belgium.

In comparison to private funding and EU funding, the reporting on national/regional funding appears to be more fluctuating. In 2015 national or regional funding accounted for almost €6 million from 11 countries. However, national or regional funding was most comprehensive in 2014, accounting then over €50 million from 15 countries (Figure 6).

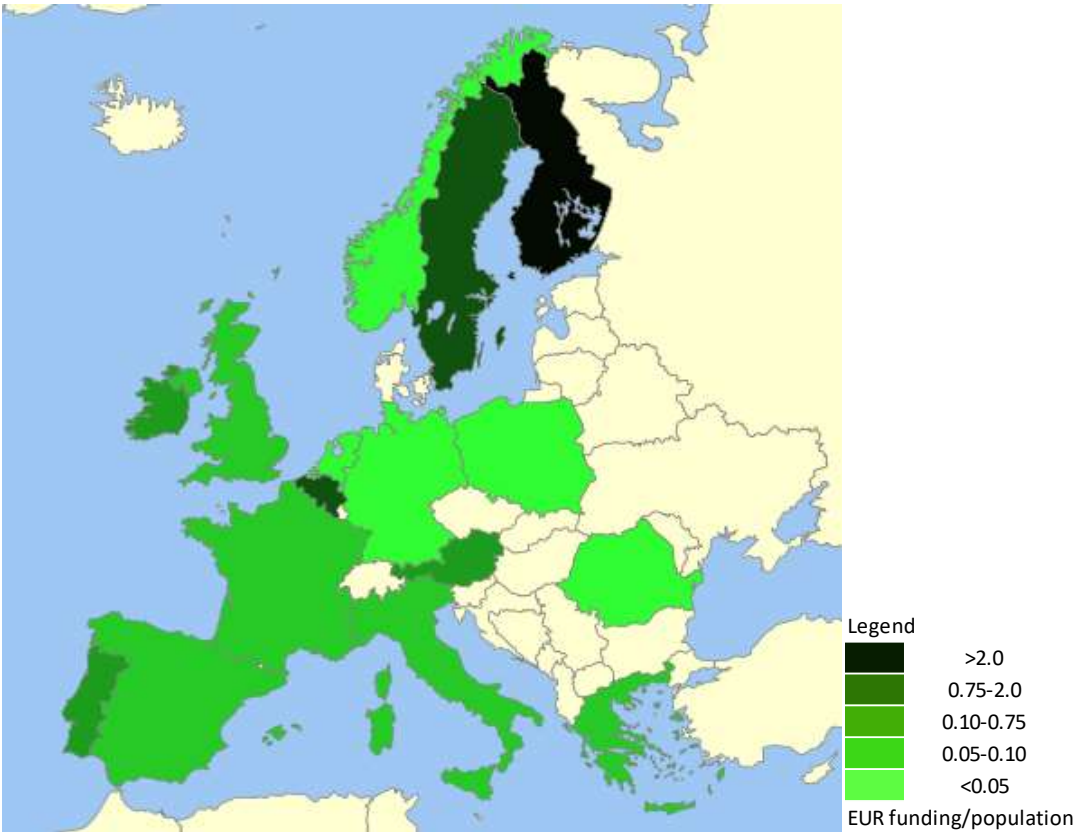
Figure 6: Trend of National or Regional Funding received by EIP Commitments since 2014, in € million



Source: JRC analysis

Since 2014, **35 EIP Commitments** received direct funding or in-kind contributions from public and regional bodies across Europe and internationally. Funding from these organisations counted for this period over **€90 million from 16 different countries** (Figure 7). Funding from national authorities dominates, while funding from regional authorities is significantly lower. An exception is the support of the Region of Flanders for EURELCO, making up the biggest single contribution in this category. 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 2014¹³



Source: JRC analysis

Due to the dominance of individual large networking EU projects (see above), the annual funding varies massively. Consequently, also the member states dominating the funding change significantly over time. In this context it is noteworthy that Belgium and Finland were the two member states showing the two biggest funding volumes not only in 2017, but also in 2016.

According to the reporting on the EIP monitoring survey, **13 Member States appear to have not provided any public or regional funding** to the EIP Commitments since 2014. **Outside the EU**, about **€3 million** of financial contributions to EIP Commitments were provided by **Gabon, Norway, Turkey, South Africa and Argentina**.

¹³ In the map, the colour-scheme for Member States has been scaled to show funding relative to population.

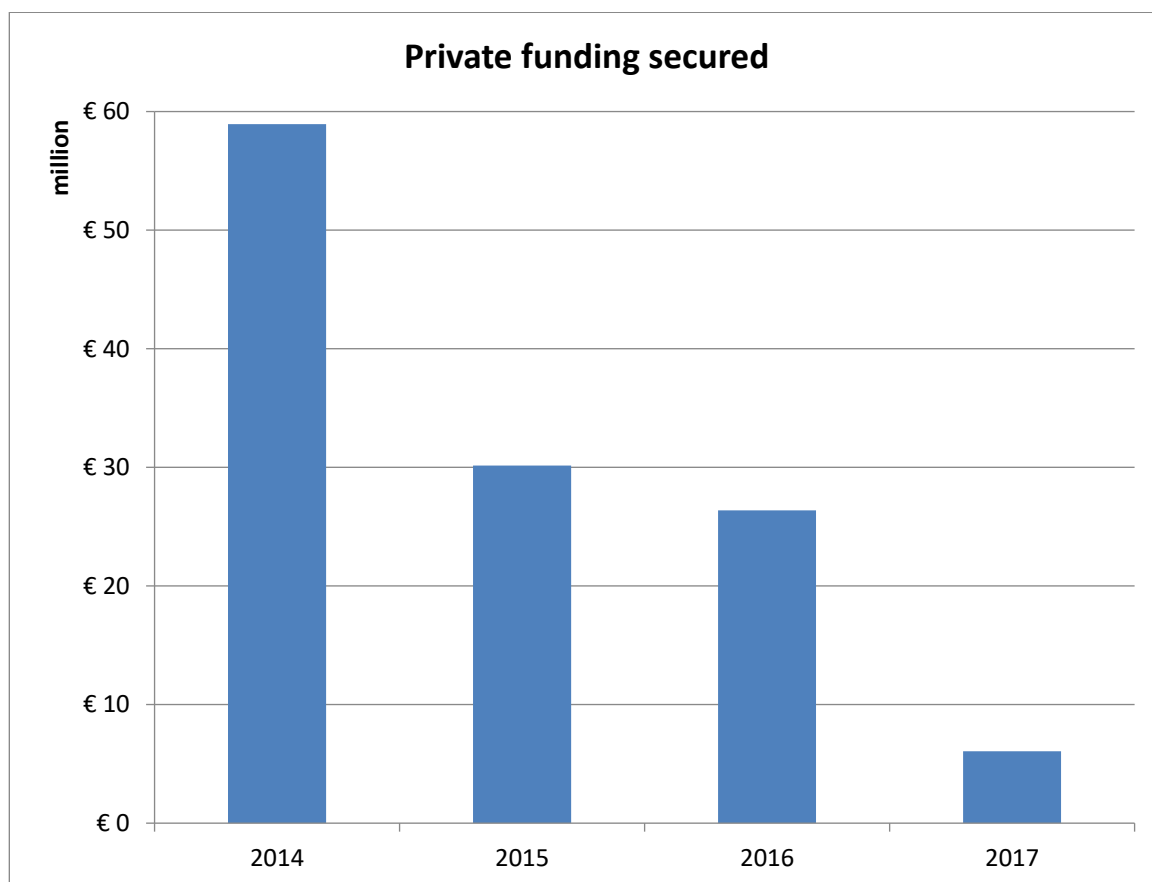
Private Funding

>> Since 2014 almost every second Commitment (48%) received private funding, worth together €122 million.

In 2017, 4 RMCs reported to have secured private funding worth together more than €6 million. They all had already received private funding earlier, thus the total number of Commitments having received private funding since 2014 stays constant as 61, while the funding increased up to totalling €122 million. After continuous decreases since 2014, the annual volume of private funding dropped significantly in 2017 (Figure 8). Further exploration is required to understand to what degree this result is influenced by the decreasing response rates.

This category is **dominated by a few large capital intensive RMCs**: 19 of the 61 RMCs secured over €1 million from private sources each. Together, these 19 RMCs add up to €113 million of private funding (93% of the total).

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 covered in this report (almost 83%) reported progress towards the planned activities, defined by documentation of outputs. Commonly mentioned activities are of an **organisational nature** (re-structuring, securing funding,

enlarging partnership etc.), while increasing focus is put on the implementation of Commitments by **research and dissemination activities**. **Few Commitments reported that they have not undertaken any significant activities** towards their Commitment goals; most of these due to a lack of funding.

The following sub-sections highlight some of the research, dissemination and coordination activities undertaken by specific Commitments since the 2016 annual monitoring survey.

3.2.1 Research activities

Research activities performed by the Commitments can be grouped into primary resources, recycling, substitutes, and harmonisation and modelling of raw materials stocks and flows. Key achievements, sorted by topic, include the following:

Primary resources

- RMC TAURUS, which carried out research activity in thermodynamic assessment of raw material use in Europe, showed progress by publishing scientific papers concerning thermodynamics for sustainable management of natural resource, critical raw materials, and life cycle assessment.
- RMC Blue Nodules completed the design requirements for the subsea harvesting equipment and delivered a report on the implementation and application of ethics requirements which concern Non EU-countries, environment, health and Safety aspect, potential misuse of research results, import and export of materials to and from the EU; involvement of low and middle income countries and details regarding protected areas and endangered species, with emphasis on plumes. RMC Blue Nodules also delivered a report concerning national and international regulations regarding endangered species and protected areas, as applicable to Blue Nodules field tests.
- RMC SOLSA published in scientific journals the results from testing of combined mineralogical and chemical analyses of drill cores on different surfaces. RMC SOLSA develops a multi-technique expert system that integrates quantitative reliable data on the chemistry, mineralogy and texture of drill cores.
- RMC PolymetOre conducts research activities aiming to develop sustainable and efficient technological solutions to benefit polymetallic, complex, and low grade ores from diverse mines located in Spain, Portugal, Poland and Serbia.
- RMC NEXT develops exploration technologies and data analysis methods expected to be cost-effective, environmentally safe and potentially more socially accepted. For this purpose, RMC NEXT brings together mining industry, service providers and research institutions.

Recycling

- RMC C&D-WRAM has been developing recovery and recycling solutions towards near-zero waste.

Substitutes

- RMC EQUATOR continued working on a substitution for Antimony as fire retardant. The developed material is made from inertized fly ash of different origins, as municipal solid waste incineration fly ash, and silica waste residues.
- RMC EU-NARS-G has been working on diversifying alternative sources of supply of natural rubber (polyisoprene), a critical raw material, on which the European tyre industry is fully import dependent. It investigated in particular the potential of Guayule (*parthenium argentatum*), a bush well adapted to semi-arid and

Mediterranean areas and Dandelion (*Taraxacum kok-saghyz* or *Russian Dandelion*) as alternative sources.

- RMC ENCRAM examined the substitution options available for refractory metals based on an analysis of material properties, applications, and the related value chain.

Harmonisation and modelling of raw materials stocks and flows

- RMC WEEE2020 delivered by means of the ProSUM project the Urban Mine Platform, i.e. the first publicly available platform providing product related data on stocks, composition and flows of electrical and electronic equipment (EEE), batteries and vehicles.

3.2.2 Dissemination activities

Among the most relevant dissemination activities are those activities addressing knowledge, skills and raw material flows as well as waste. Moreover, some commitments organized specific dissemination events such as conferences, workshops, and meetings during 2017.

Waste area

- RMC EURELCO has actively disseminated its outputs in the field of enhanced landfill mining. RMC EURELCO also organized various dissemination activities, including workshops and conferences, general assemblies, and further dissemination products. Among the recent publications, RMC EURELCO together with RMC NEW-MINE published an extensive Policy Brief which discusses the six lessons learned during the 4th International Symposium on Enhanced Landfill Mining (ELFM).
- RMC IMPACT has promoted separate paper collection in Europe through the website of the commitment's project.
- RMC ZEROWASTE has conducted a dissemination activity through the publication of a website.

Knowledge, skills and raw materials flows

- RMC TAURUS has organized a number of collaboration events among the Commitment partners, resulting in project proposals at national and European level. More than 10 scientific papers on the evaluation of mineral resources by means of an exergy-based methodology were published.

Events: conferences, workshops, and meetings

- RMC EMD who has been organising European Minerals Day since 2013, continued to explore the possibility of organising an exhibition in the European Parliament and developed a promotional video on the pan-European open days initiative. The 2017's edition has been scheduled.
- RMC NATUREUROSTONES took part as organizer of a session at European Geosciences Union General Assembly 2017 on Heritage Stones.
- RMC IMPACT: An information meeting was held in January 2017 in Barcelona.
- RMC Blue Nodules held the 4th General Assembly meeting held at the Universitat Politècnica de Catalunya, in Vilanova i la Geltrú, Spain.
- RMC CUBES held annual meeting in October 2017.

- RMIC Effiwood organized several workshops and capacity building.
- RMC MIREU held a conference on mining in Valladolid in March 2018.
- RMC NOWMOB organized European Softwood Conference and European Hardwood Conference and related stakeholder discussions.

3.2.3 Coordination activities and proposals

The following commitments conducted coordination activities and proposals:

- RMC EURELCO provided legislative support, including an EU Action Plan for European Landfill Mining. RMC EURELCO prepared the organisation of the 4th International Symposium on Enhanced Landfill Mining (ELFM). The symposium addressed technical, social, policy, and environmental aspects of ELFM. More than 150 attendees from academic, industry, policy makers, and general public participated to the event.
- RMC EUROPEM participated in the creation of PROMETIA, an international non-profit association that promote innovation in mineral processing and extractive metallurgy for mining and recycling of raw materials. RMC EUROPEM organized a scientific seminar in November 2017, addressing the technical aspect in raw materials processing technology.
- RMC EHIA took part in consortia building for a joint call under the Forestvalue ERA-NET COFUND scheme. This scheme aims at promoting increased innovation and competitiveness of the forest-based sector in Europe and support its transformation from a resource-intensive to a knowledge-intensive, productive, resource-efficient and resilient sector.
- RMC RUBB-ENDURE set up a new consortium and submitted a H2020 proposal on recycling of raw materials from end-of-life products.

3.2.4 International cooperation

- RMC SmartExploration signed an MoU with Metal Earth Canada, with the objective to establish an exchange of knowledge and ways to collaborate.
- Several RMCs were involved in joint collaboration projects at international level, such as RMC NOWMOB in several pan-European projects, such as EFFORTE; VERAM, MEOLO, VARMA, SmartLog, Baltic Forbio. RMC Effiwood participated in the exchange of knowledge "state of the art" within the European network InnovaWood and others.
- RMC ELTSTANDARD started a collaboration with the American Society for Testing and Materials (ASTM) in the exchange of data focusing on technical cooperation in the field of tyres recycling.
- RMC IMAGINE participated in the partnership with seven Latin American countries as part of the Mineral Exploration Trade Show (METS) and Mineral Development Network Platform (MDNP). The objective of the partnership is to facilitate dialogue between the relevant global stakeholders through the creation of a network of focal points in the Asia-Pacific region.
- RMC Euminet, in collaboration with the PanAfGeo project (Geoscientific knowledge and skills in African Geological Surveys), organized trainings on mineral resources assessment, environmental management of mines, artisanal and small-scale mining.

3.2.5 Other activities

Many of the Commitments reported that they **improved their operational structures** (governance meetings of potential consortium partners, workshops, website development, and work package definition and proposal writing) in order to act more efficiently and **secure funding**.

Several Commitments also made **a contribution to the EIT Raw Materials**. An outstanding example is RMC NEXT, which extended its network in the raw materials community through conferences, workshops, stakeholder meetings, its website, social media, videos, and educative materials, in synergy with, amongst others, the EIT Raw Materials and further partners.

3.3 Outputs

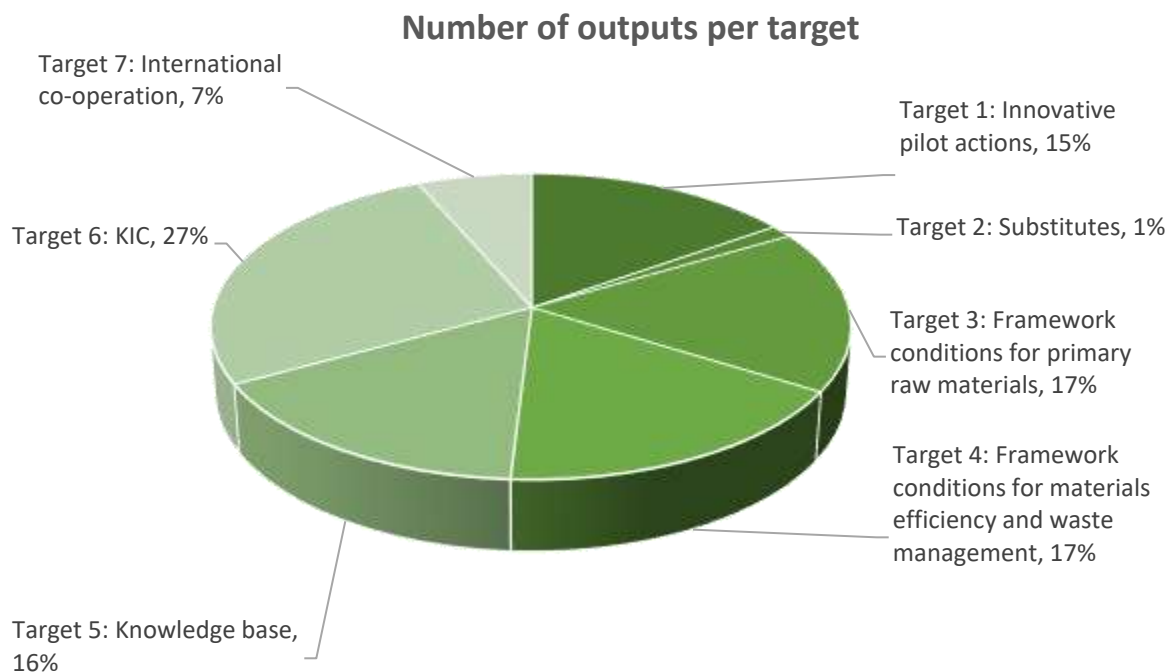
>> Many Commitments are delivering tangible outputs, of which the largest shares contribute to Target 6 Knowledge and Innovation Community and Target 3 Framework conditions for primary raw materials

This section focuses on outputs delivered by Commitments. **39 EIP-RM Commitments** (out of the 47 respondents of the 2017 annual survey) **reported achieving at least one output since the launch of the RMCs**.

Figure 9 presents an overview of **how these outputs relate to the EIP targets**¹⁴. Most commitment contributed to target 6: KIC (27%), followed by target 3: Framework conditions for primary raw materials (17%) and target 4: Framework conditions for materials efficiency and waste management (17%). This picture is relatively different compared to the AMR 2017 where most of the commitments contributed to target 2: Substitutes (27%), followed by target 1: Innovative pilot actions (21%) and target 6: KIC (14%).

¹⁴ As defined in the EIP Strategic Implementation Plan

Figure 9: Contribution to the EIP targets by the outputs delivered by EIP-RM Commitments reported for 2017. The number of targets (here shown as %) is weighted by the number of targets quoted per RMC.



Source: JRC analysis

>> Commitments continued to achieve innovation-related outputs with a reduced intensity

Similar to 2016, several Commitments have developed **new technological processes** such as the following RMCs (**Figure 10**):

- RMC MetGrow develops innovative metallurgical technologies to extract the following metals: nickel, copper, zinc, cobalt, indium, gallium, germanium. These metals have not been exploited due to some technical bottlenecks.
- RMC PolymetOre develops innovative technology for producing cemented carbides with reduced content of Critical Raw Materials.
- RMC BLUE NODULES develops a research and innovation project in a deep sea mining system for the harvesting of polymetallic nodules from the sea floor with minimum environmental impact. At the current stage, RMC Blue Nodules has tested the nodule cracker tool.

In the new business models category, RMC NOWMOB continued to create flexible forest ownership models, resource efficient wood allocation and delivery models for bio refining and bioenergy industries, and regional collaboration models for wood harvesting enterprises and forest industry companies. Also, RMC CTC consistently developed the concept called Enhanced Landfill Mining to recover raw resources, energy and land from historical and existing landfills.

Under **Joint R&D category through pooling of competences/resources**, , the work of RMC SmartExploration focused on developing cost-effective, environmentally-friendly tools and methods for geophysical exploration in highly challenging brownfield areas to meet the ever-increasing community (social acceptance) and environmental issues, as well as reducing the return time (from exploration to production). A number of organizations such as UU, Polito, TU Delft and TUBAF are working together for improving, for example, deep imaging of mineral deposits. Another output comes from RMC ITERAMS who focuses on developing methods for closing the water loops and for geo-polymerization. RMC ITERAMS has participated in a group of experts in a scientific seminar focusing on raw materials flexibility.

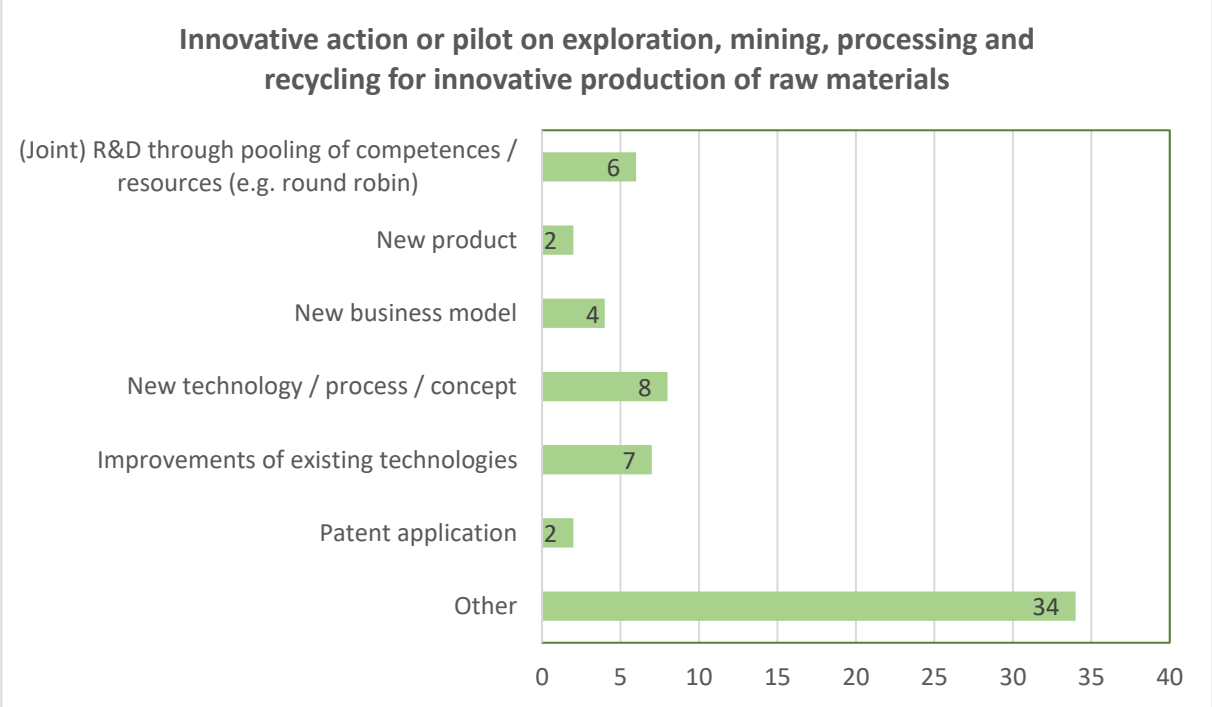
An example of a new **product** is given by RMC SIMS, who has conducted a demonstration of a new product in the ground support technology, with the main aim to test and demonstrate relevant technologies for an intelligent mining system.

Several RMCs were involved in the **improvement of existing technologies**, such as RMC MetGrow, that has been developing several existing technologies in the metallurgical sector through its METGROW+ project. RMC PolymetOre has been working on increasing chalcopryrite leaching efficiency to be eventually applied in existing atmospheric leaching industrial plant in a mine.

RMC RUBBERTOMARKET and RMC Subst-extreme each generated a **patent application**. RMC RUBBERTOMARKET produced a patent in the field of tyre recycling, while RMC Subst-extreme one related to innovative technology for producing cemented carbides with reduced content of Critical Raw Materials.

RMC RUBBERTOMARKET produced various **other innovation-related outputs**, focusing on developing several collaborations with various partners like companies and research institutions to prepare European proposals for the development of new applications for end-of-life tyres materials. Each organization partner is also developing R&D projects.

Figure 10: Specific innovation outputs since 2014



The graph shows the number of specific innovative outputs since 2014, as reported by the Annual Monitoring 2017 Survey. Source: JRC analysis

>> *Several Commitments developed alternative solution for critical raw materials*

RMC ENCRAM, which aims at gathering the different initiatives (associations, clusters, projects, etc.) working on CRMs into an expert network on critical raw materials, published several deliverables. One of them outlined the potential substitutes of refractory metals based on analyses of the properties, applications, value chain and the potential substitutes. The deliverable also highlighted a search for new application areas for raw materials, where they can substitute other, less performing materials. Other RMCs focused on the substitution of critical raw materials: EU-NARS-G has been working on alternative sources of natural rubber, whereas Subst-extreme on the substitution of tungsten and cobalt in various applications. RMC BioAlminore has developed a solution to extract low grade ores, to utilise by-products from mining, and to recover rare metals from production waste.

>> *Commitments published increasingly strategic documents supporting implementation measures*

For the category "Strategic document", the highest number of outputs comes from "guidelines/reference document", followed by "industry standard". Several outputs produced by the RMCs contained policy recommendations (**Figure 11**).

RMC CRAM, produced a **roadmap** towards a strategy for raw materials necessary to the European ceramic industry.

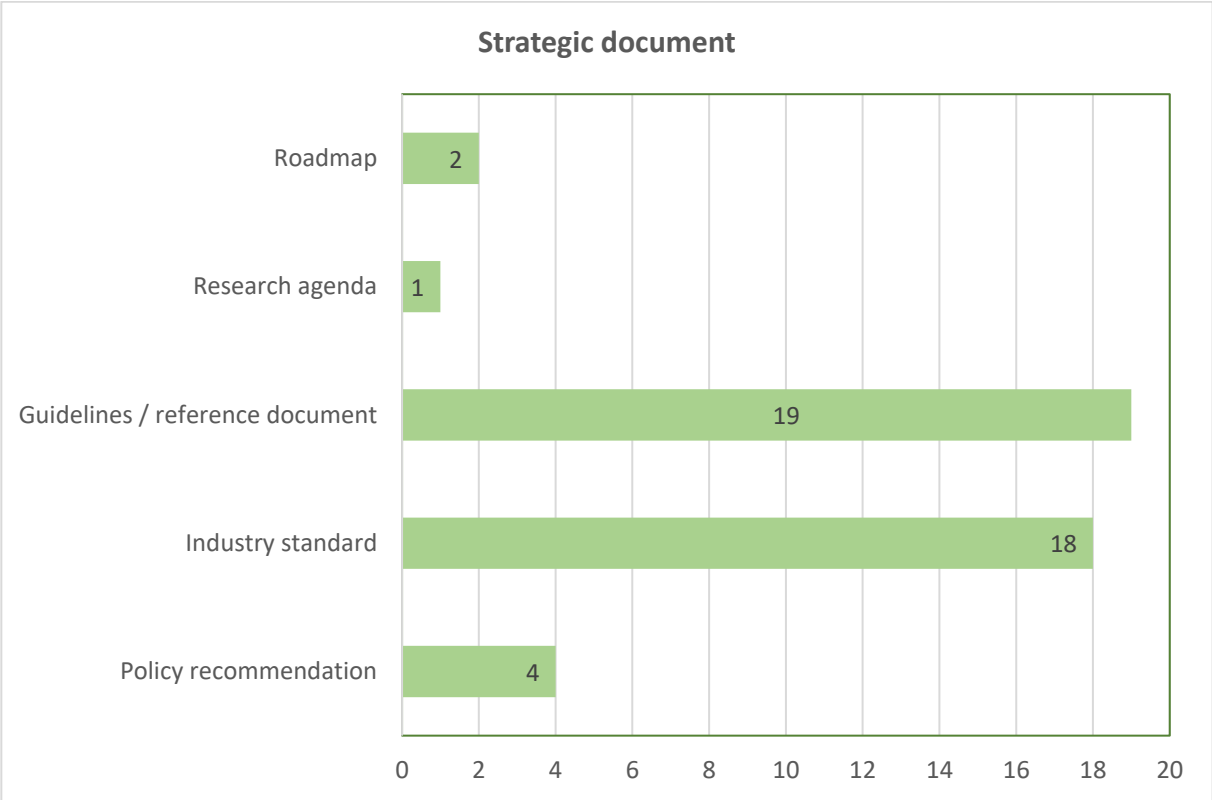
In the sub-category **guidelines/reference document**, RMC CRAM produced several guidelines to support waste recycling in ceramics. The RMC-RUBBERTOMARKET finalized several standards on recycled rubber and the application. The RMC-CRM InnoNet conducted a screening effort for guidelines/reference documents to inform and focus the discussion around attractive substitution opportunities and to provide a current policy frame for the recommendations of the project.

In the sub-category **industry standard**, RMC-ELSTANDARD produced EN standards on end-of-life tires (ELT), mostly voluntary documents. RMC RUBBERTOMARKET, in close collaboration with RMC ELTSTANDARD produced EN standards that encourage the use of secondary raw materials in different applications and help to open new market opportunities. RMC Stand4Mines published UNE 22470 on Sustainable mining management system and UNE 22480 Sustainable mining management systems. Requirements.

Several RMCs provided **policy recommendations**. A prominent commitment in this respect is IMPACT, which deals with the management of waste paper, formulated policy recommendations targeting the EU, Member States, local/regional authorities, waste management companies, and paper companies.

In terms of the sub-category **research agenda**, RMC PolymetOre, aiming to develop sustainable and efficient technological solutions to benefit polymetallic, complex, and low grade ores, planned to develop the primary massive sulphides exploitation project. A particularly important action in 2017 was to develop the investigation ramp for underground mines.

Figure 11: Specific strategic document outputs since 2014



The graph shows the number of specific strategic document outputs since 2014, as reported by the Annual Monitoring 2017 Survey. Source: JRC analysis

>> **The largest number of the outputs achieved by the Commitments continues to relate to knowledge sharing**

Under the category “knowledge sharing / dissemination of information and best practices, the categories for which the highest number of outputs are reported are the sub-categories “event/workshop/conference” and “websites” (**Figure 12**). The major part of the outputs reported for “event/workshop/conference” is contributed by RMC CRM_EMD that organised a number of events, of which the biggest one was The European Minerals Day during the Estonian presidency. RMC NOWMOB held the European Softwood Conference and European Hardwood conference and related stakeholder discussions, and several pan-European project workshops.

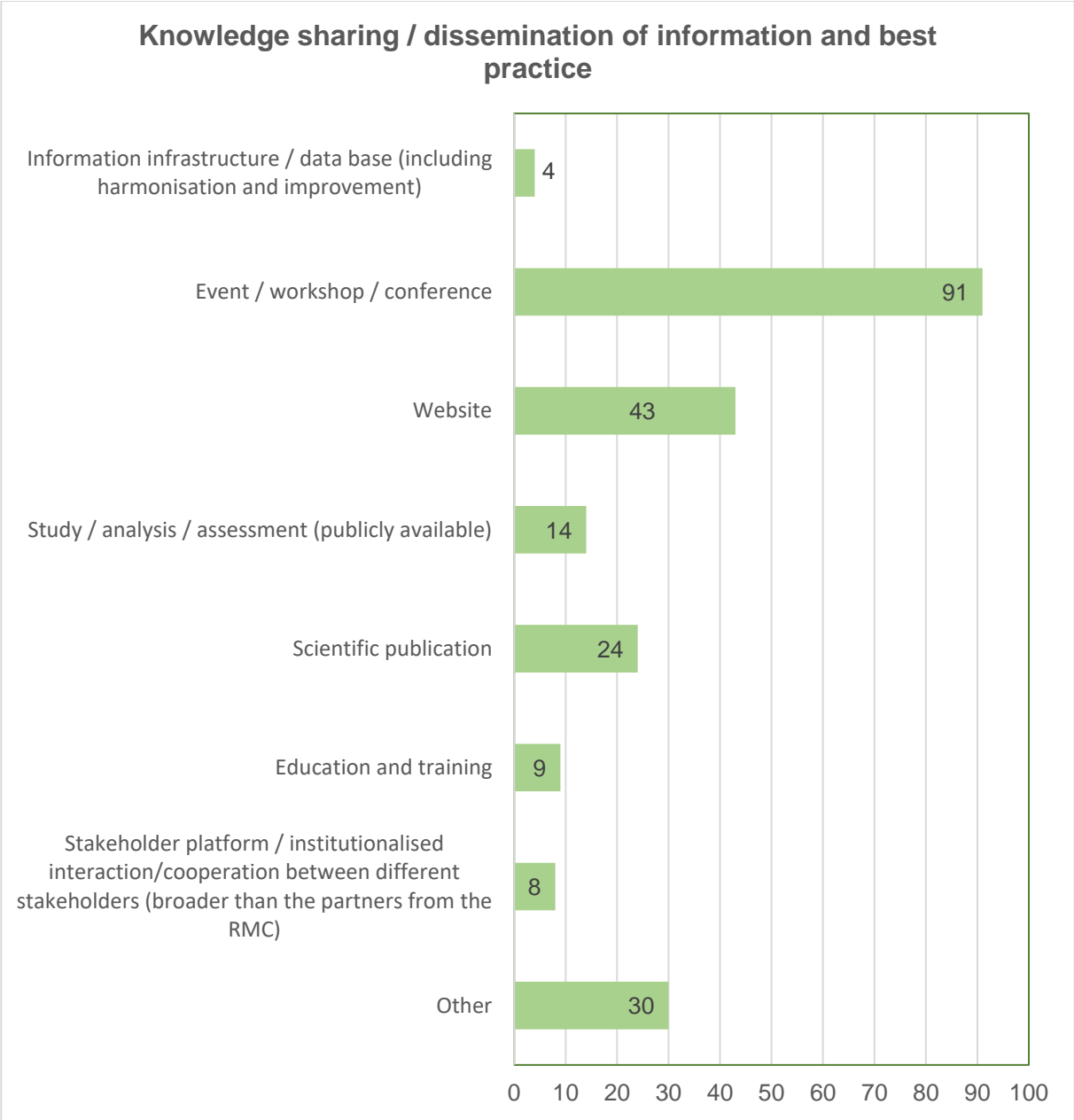
Related to the events organized by RMC EMD, a number of websites have been created, making RMC EMD the major contributor for the **website** outputs. The website outputs almost doubled compared to 2016.

Several RMCs achieved outputs in the sub-categories **scientific publications** and **study/analysis/assessment**. A significant number of publications are related to RMC ELTSTANDARD, which published eight scientific publications before developing a standard related to end-of-life tyres. RMC RUBBERTOMARKET together with the partners were involved in different research projects that led to the publication of five scientific reports. Several others scientific publications were also produced by RMC EQUATOR, RMC SOLSA, RMC WeCARE, and RMC WEEE 2020.

Other output in **knowledge sharing/dissemination of information and best practice** come from RMC RUBBERTOMARKET. Together with the partners, RMC RUBBERTOMARKET has triggered the communication and dissemination of best practices in the utilisation of

rubber from end-of-life tyres (ELT) in different applications. To this end, partners have carried out different actions as sponsorships, donations and appearance in mass media.

Figure 12: Specific knowledge outputs since 2014



The graph shows the number of specific knowledge outputs since 2014, as reported by the Annual Monitoring 2017 Survey. Source: JRC analysis

>> **The Commitments achieved a high number of outputs in international cooperation, especially on knowledge sharing/dissemination of information and best practices**

In terms of advancements in the category **international cooperation**, “knowledge sharing and dissemination of best practices” continues to be the sub-category with the highest numbers of outputs, followed by participation of RMCs in joint collaboration projects, as well as by events/workshops/conference organisations (**Figure 13**). The

predominant contributors to the sub-category “knowledge sharing and dissemination of best practices” are the following RMCs:

- RMC Blue Nodules participated in several conferences at European and international level such as the 23rd ISA annual conference in Kingston, Jamaica (poster presentation).
- RMC ELTSTANDARD published some documents that could be used as an international reference in the field of tyres recycling. Certain collaborations have been established between The European Committee for Standardization, where the RMC partners participate actively, and the American Society for Testing and Materials (ASTM) in the exchange of data focused on enabling the technical cooperation.
- RMC IMAGINE supported EC initiatives under Partnership Instrument with selected countries, namely seven Latin American countries as part of the Mineral Exploration Trade Show (METS) and Mineral Development Network Platform (MDNP).

Several RMCs **participated in joint collaboration projects**: RMC NOWMOB is the biggest contributor by becoming involved in several pan-European projects, such as EFFORTE; VERAM, MEOLO, VARMA, SmartLog, Baltic Forbio and several national projects related to the partners. RMC Effiwood participated in the exchange of knowledge “state of the art” within the European network InnovaWood and others. RMC EHIA facilitated the consortia building for a joint call under the Forestvalue ERA-NET COFUND scheme. RMC MINSPIRE, in collaboration with EIT Raw Materials and EIT Climate, organised two workshops, i.e. one on sustainability indicators for mining SMEs, and one on water challenges in mining regions.

Various **events, workshops, and conferences** with focus on international cooperation were organized in 2017:

- RMC Blue Nodules organized a general assembly, while RMC Blue Nodules and RMC Effiwood held workshops for capacity building.
- RMC EHIA held two conferences in 2017 to present the EHIA first draft database in Nancy, France.
- RMC NOWMOB organized, amongst others, the European Softwood Conference and European Hardwood Conference and related stakeholder discussions.
- RMC SmartExploration signed a memorandum of understanding (MoU) with Metal Earth Canada. The MoU established an exchange of knowledge and ways to collaborate.

Five Commitments reported outputs in the sub-category **education and training activities**. For instance, RMC EHIA contributed to facilitating the development of new education and training programs (“online education program”). RMC Euminet organized trainings on mineral resources assessment, environmental management of mines, artisanal and small-scale mining with the PanAfGeo¹⁵ project. Some partners of RMC NATUREUROSTONES prepared a proposal for the ERASMUS program to collaborate with African countries on mining and education, and participated in a joint meeting to study potential calls to apply for funding.

¹⁵ Geoscientific knowledge and skills in African Geological Surveys

Figure 13: Specific international cooperation outputs since 2014



The graph shows the number of specific knowledge outputs since 2014, as reported by the Annual Monitoring 2017 Survey. Source: JRC analysis

3.4 RMC and UN Sustainable Development Goals

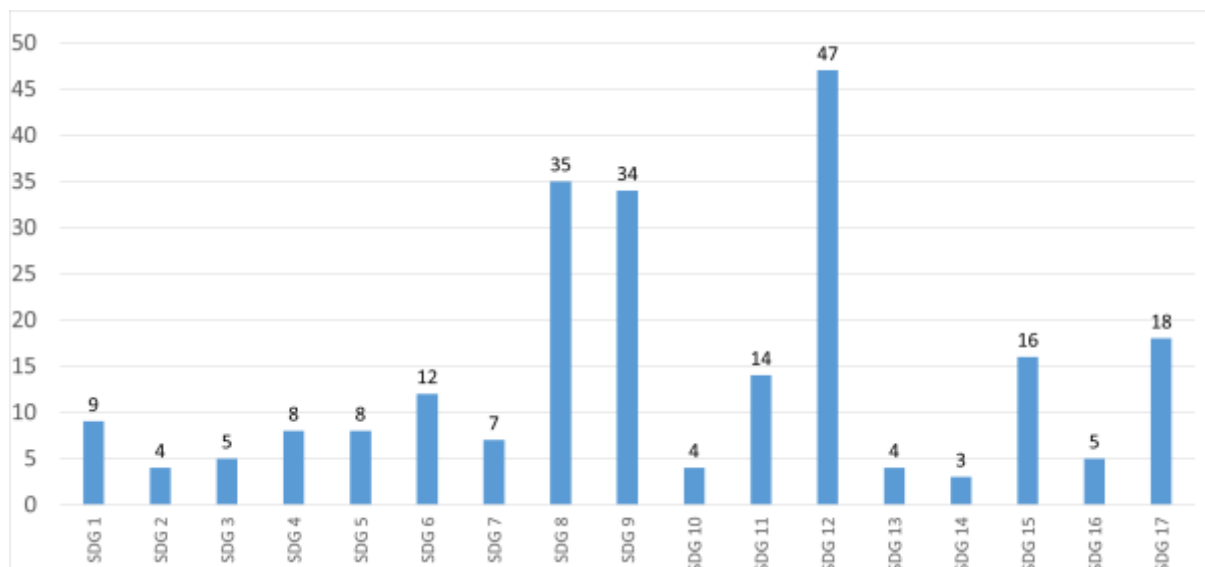
In 2015, the UN General Assembly adopted a set of 17 Sustainable Development Goals (SDG) and 169 related SDG targets. As the EU has committed to implement these SDGs both in its internal and external policies, it is important to follow up on general and sectoral contributions. This applies also for the raw materials sector. The Annual Monitoring Report 2016 demonstrated for the first time to what extent and in which way UN Sustainable Development Goals have been addressed by the activities of the diverse RMCs, and the edition of this year updates that analysis.

Figure 14 shows for each of the 17 SDG, how many individual Commitments address the related targets, providing an indication on what UN Sustainable Development Goals the Raw Materials sector contributes predominantly. The analysis of the AMR 2017 survey¹⁶ confirmed and consolidated the conclusions drawn on last year’s analysis.

Firstly, more than 230 linkages were identified by the respondents of the survey. These linkages refer to all the 17 SDGs, while there are significant differences between them. While all SDGs are addressed by at least three Commitments, half of the linkages (50 %) are concentrated on three SDGs (SDG8, SDG9, SDG12) outstanding from the remainders. SDG12 is addressed by more than two out of three respondents (67 %). A second group of frequently addressed SDGs comprises four SDGs (SDG17, SDG6, SDG15, SDG11), with each SDG showing 5% or more of the total linkages.

¹⁶ The AMR2017 survey aimed to close gaps and update the data set of the AMR2016 survey. Almost two out of three (64 %) of the 47 respondents of this section did confirm that the existing data is up-to-date. Seven new RMCs were added and thus contributed to fill gaps, while two RMCs updated their linkages. These changes resulted in increasing number of linkages for the majority of the SDGs.

Figure 14: Commitments addressing the Sustainable Development Goals (N=70).



Source: JRC analysis

Within the three dominating SDGs, the following observations of last year were affirmed:

- SDG12 Ensure sustainable consumption and production patterns: the key addressed targets relate to the sustainable management of natural resources, waste reduction and environmentally sound management of chemicals and wastes
- SDG8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all: increasing economic productivity and improve resource efficiency;
- SDG9 Innovation and infrastructure: enhancing the scientific research and technological capabilities.

Obviously, the RMCs address as expected primarily economic development, and the related environmental performance, employment, and research and innovation.

3.5 Future Plans

The Commitments have various future plans corresponding to the differing degrees of commitment maturity. Many of the Commitments are already entering or executing 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.

>> Funding opportunities

To sustain their commitment activities, the following RMCs intend to complete and submit funding applications in 2018:

- at EU level (EIT Raw Materials, FP9, H2020): RMCs BioAlMinore, CuBES (various proposals), INCOMES, pHMine, RUBB-ENDURE, PolymetOre, WeCARE;
- at national or regional level: RMC pHMine.

As a basis for preparing a sound subject-related project proposal, RMC NATUREUROSTONES aims to widen up the network with other parties by active participation in various related meetings (cf. below).

>> *Execution of funded projects*

Commitments that **obtained funding** through successful applications in 2017 will **begin working in 2018**, like RMC Euminet that is implemented by the GeoERA project (branch on minerals) via the projects FRAME, Mintell4EU, MINDeSEA, and EuroLithos. BioAlMinore will start the FCT project MicroMiner¹⁷. Further examples are the various Commitments involved in the implementation of the EIT Raw Materials as reported in chapter 3.2. BioMORe, in contrast, has received a project prolongation by six months and uses this extension to deliver information about the conditions, for which the BIOMORe process is suitable for metal winning. This will also be the basis for trying to secure funding for the next phase of the approach, i.e. the BIOMORe pilot plant.

RMC ITERAMS continues the execution of the H2020 ITERAMS project, and RMC EQUATOR will investigate in the coming years the fire resistance of new composites, obtained by using a different filler, generated from waste.

>> *Thematic Discourse and Discussions*

Almost all of the **network and co-ordination Commitments** plan to continue a range of activities through 2018, for example RMCs BioAlMinore, Effiwood, MINSPIRE, and IMAGINE. RMC BioAlMinore shall participate in three operational groups of the EIP-RM, as well as in the project FORAM. Further, RMC ENCRAM will support via the project SCREEN the identification of innovative pathways for new CRM value chains in Europe. As a follow-up of the 2016 edition, RMC RESET will sponsor the 2018 edition of the EMRS conference and contribute by a dedicated symposium to Critical Raw Materials (CRM) targeted on academic and industrial partners working on the substitution and recyclability of CRM in electronic, magnetic and energy harvesting devices. The RMC WEEE 2020 partners, as beneficiaries in the projects C-SERVEES, ORAMA and COLLECTORS, will mainly focus on related communication activities and mapping exercises.

RMC SIMS is going to establish project-related stakeholder platforms. RMC EHIA will facilitate the building of RTDI consortia on both European and transnational levels. RMC EMD and RMC BioDIMA plan to contribute to the revision of the Natura 2000 guidance for the NEEI sector, which is organised by the EC. BioDIMA will strengthen this support for Annex II by a data collection of new case studies on Biodiversity across the EU. RMC EMD intends to align its actions and key messages with similar initiatives in the area "social licence to operate", for example with RMC MIREU. RMC EHIA plans several workshops dedicated to the identifying potential new fields of application and facilitating the creation of new markets.

RMC MINSPIRE strives in general for improved collaboration aiming for consolidating existing networks by increasing exchange of ideas and people. The partners of RMC RUBBERTOMARKET will participate in different R&D projects with the aim of developing new applications for materials from end-of-life tyres. Furthermore, they will attend to different conferences and workshops to share the best practices and disseminate the results obtained in these projects.

Several Commitments will particularly contribute to the Raw Materials Week 2018 in Brussels, like RMC EMD and RMC WeCARE. For example, RMC ENCRAM will support the

¹⁷ The full name of this national project is: Microbiological technologies in mining and recycling of high-tech critical metals

organisation by SCRREEN of a one-day event, and RMC Subst-extreme plans a meeting during the RMW.

>> *Dissemination and Promotion*

The Commitments will use various events in 2018 to strengthen the cooperation and dissemination. RMC EMD plans together with RMC ENSQM to organise events on mining permission in October 2018, Berlin. BioAlMinore is going to organise a workshop "Environmentally sustainable processes in critical metals recovery: bio (micro) technologies to support a circular economy of raw materials" in Coimbra, Portugal. It will held its work meeting with the *Cluster Portugal Mineral Resources*, Portugal and participate at the REMIX INTERREG Europe, a project that encourages resource efficient and environmentally and socially acceptable production of raw materials, including critical raw materials. RMC NATUREUROSTONES will organise a workshop on Heritage Stones, October 2018, and attend the European Geoparks meeting that will take place in the Global Geopark "Las Loras", Spain, the Global Stone Congress in Brazil, and a workshop at the MNHN, Paris. RMC NATUREUROSTONES and RMC EMD plan to both attend the MinGuide policy laboratory event in Madrid. RMC WeCARE intends to present its activities to the REFRESCO project, which is an EU project on Circular Economy.

RMC SUMAN 2000 will participate in events promoting sustainable mining activities and the possibilities to reconcile mineral exploitation with Natura 2000 sites.

RMC EUROPEM has prepared a full set of activities aiming to promote the linkages between research, industry, and training.

RMC EURELCO intends to intensify its public outreach by newsletters, press articles, workshops (e.g. joint workshop with EIP Raw Materials on CRMs & ELFM), video reports (e.g. EURONEWS NEW-MINE video), and documentaries (BBC4 film).

RMC BioDIMA plans to create a website to promote the deliverables of various projects that contribute to BioDIMA. RMC SIMS plans to present in October 2018 first communication tools and materials developed. RMC IMPACT will maintain the www.impactpaperrec.eu website (executed by CEPI), and envisages translations of the main outputs from IMPACTPapeRec. In addition, IMPACT partners will gather in June to pledge actions to continue promoting results of IMPACTPapeRec. RMC ITERAMS will publish the public deliverables at the ITERAMS project webpage.

RMC BioAlMinore will support science communication by its continued participation in high school projects related to the circular economy concept.

>> *Research and Development* Various activities are planned in the mining sector: RMC SmartExploration will deliver several reports to regulate its operation across various sites, including issues related to safety and environment as well as ethical matters. Different field activities are planned to be started before summer 2018.

RMC SOLSA plans to contribute to drilling advancement by preparing a user drill manual, with drilling tests foreseen in May 2018 at Giesbeek (NL) on 3 large blocks of fresh rocks, and in September in SODICAPEI's bauxite mine, for testing the performance of the rig, related to the speed, recovery and quality of the core samples. SOLSA will also contribute to filling the Open Raman Database, the Open Crystallographic Database and the Open Hyperspectral Database. Further tests on specific analytical techniques as well as combined analytical techniques will be performed, on samples of "pure" minerals and mineral associations applying XRD, XRF and Raman techniques. The field tests planned in the SODICAPEI's bauxite mine in southern France will be prepared, including the preparation of the library related to bauxite minerals and practical issues. RMC Stand4Mines intends to advance the establishment of European Standards of Sustainable Mining Management by the Revision of Spanish standards UNE 22470 and UNE 22480. The RMC NEXT consortium will start the project "New Exploration Technologies" (H2020) on 1st May 2018. The project

will cover beside mineral systems modelling and novel exploration technology also activities on the “social license to explore”. In the marine sector, RMC Blue Nodules strives for an exploration cruise in EU waters in Q3/2018. A test mining vehicle is under construction and will be tested.

RMC PolymetOre plans to promote the application of developed technologies within EU projects, in particular, it will support the new Poly Metallic Refinery Project from Cobre Las Cruces, which is expected to extend life of mine beyond 2030. Further, PolymetOre continues cooperating with Junta de Andalucía and AMINER association to promote new mining business and related activities in the Iberian Pyrite Belt. RMC MetGrow plans to further i) advance the recovery of metals from complex sources, low grade ores and industrial residues and ii) increase the resource efficiency in downstream processing especially via the METGROW+ project.

RMC Subst-extreme will foster the development of materials for conditions of extreme high temperature and heavy wear by further scientific publications and conference presentations.

In the ceramics sector, RMC CRAM pushes towards an improved understanding of the ceramics value chain by a four-pronged approach. Firstly, a critical review of the data availability will be performed, secondly, an overview will be provided on the critical raw materials used in the European Ceramic Industry, thirdly, a report on ceramic raw materials flows will map the actual material flows throughout Europe and surrounding countries, and fourthly, ‘Guidelines to support waste recycling in ceramics’ will be further developed, aiming for designing recycling solutions for distinct classes of wastes into adequate manufacturing cycles (e.g. ceramic tiles or clay bricks).

RMC WeCARE pushes forward the efficient use of raw materials in the construction sector mainly by individual research activities of the Commitment partners on the related topics.

In the recycling sector, RMC C&D-WRAM aims for developing improved recovering and recycling solutions towards near-zero waste.

The partners of RMC RUBBERTOMARKET will continue to promote the use of materials from ELT in different applications by increasing trust in the quality of materials generated from end-of-life tyres (ELT). Actions include working on Standardization (CEN/TC 366), providing related technical information, publishing reference documents and guidelines, but also activities related to circular economy and the reuse of materials derived from ELT, as well as to demonstrate the compliance of secondary raw materials from ELT with health and safety aspects.

In the area of waste management, RMC EURELCO intends to stay a key driver by running the projects NEW-MINE, COCOON, NEW RAWFILL, and NEMO. EURELCO will continue its policy work to achieve more legislative support for European Landfill Mining, also in cooperation with various MEPs. In addition, EURELCO plans to extend its membership basis and expand to the 14 EU Member States that are not yet involved in EURELCO.

RMC ZeroWaste-NoI intends to set up in 2018 an overall network of infrastructure, i.e. a Zero Waste Cluster (ZWC) ‘virtual’ laboratory that is optimally used within and beyond the operations of the EIT Raw Materials, in order to boost the development, testing and implementation of new residue based products. This includes both an improved and easy access to the network services to increase the number of collaborative R&D&I, technical support on scale-up and implementation, and also a launching platform for new externally-funded initiatives complementing the virtual laboratory with real life demonstrators.

In the forest sector, the “Knowledge Database” developed by RMC EHIA has been validated by its steering committee. In the future, this database shall be enlarged and used for various analyses to structure the existing competences and to stimulate innovative actions. During 2018 the focus of RMC NOWMOB is on initiating and launching RDI consortia and project planning on roundwood mobilization (H2020, ERANET Forest Value Chains, Interreg Europe and other regional programs). In addition, NOWMOB partners will support and realize also national and regional project planning and adoption of good practices from

different countries and regions, as well as organize industry-driven conferences such as the European Softwood Conference and the European Hardwood Conference. RMC EU-NARS-G explores options for diversifying the sources of supply of natural rubber by investigating the farming of substitute plants to hevea, currently the only commercial raw material for natural rubber. In this respect, various activities related to the Guayule plant were planned, including the VALORHIZ start-up (Graine-ADEME project), which looks at practical issues of Guayule farming, the GUAYULE-SIM project modelling of guayule plant growth, a thesis on the extraction of resins from guayule (SATT, still to be funded), IAR Pole providing an in-depth economic assessment of Guayule valorisation (Biorefinery Cluster), and the installation of an innovation center for tyre testing in the vicinity of Santa Cruz de la Zarza, Spain (Nokian Tires).

Annex 1. Number of RMCs contributing to each Action Area¹⁸

Pillar	SIP Action Area	Coverage
Technology	I.1 Improving R&D&I coordination in the EU	26
	I.2: Exploration	14
	I.3: Innovative extraction of raw materials	30
	I.4: Processing and refining of raw materials	25
	I.5: Recycling raw materials from products, buildings	27
	I.6: Materials for green technologies	5
	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	40
	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	22
	II.8: EU Raw Materials Knowledge Base	17
	II.9: Possible EIT Knowledge & Innovation Community	4
	II.10: Optimised materials flows along value chains	22
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	14
	III.5: Investment activities	4

Source: JRC analysis

¹⁸ This table presents results from the AMR2017 Survey combined with results from the AMR 2016 and AMR2015 Surveys (for those RMCs that did not participate in the AMR2017 Survey, or not provide this information). The colour coding relates to the coverage of the Action Areas divided into 3 tiers, from high coverage (dark green) to low coverage (light green).

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