

Towards a comparative overview of innovation programmes in Europe

Benchmark report 2012-2014 of Taftie's Structural Network on Benchmarking



The European Network of Innovation Agencies

Summary and conclusions

This report summarizes the main findings of a benchmark of standard indicators on innovation programs managed by innovation agencies. It is initiated as pilot project by fourteen Taftie member innovation agencies with the ambition to set up a comparative benchmark of the innovation programs they manage. The benchmark summarizes key input and output indicators (like, for instance, budget, grants, beneficiaries and participants) of four types of instruments aimed primarily at business enterprises (R&D grants, cooperative gents, innovation vouchers and competence centre schemes).

As the benchmark exercise described in this report in the first place was a learning exercise, the main conclusions refer to the lessons drawn from this exercise. The *first lesson* is that we - as innovation agencies organized in Taffies' benchmarking network - are able to develop a benchmark of the innovation programs we implement. Based on a comparative framework developed earlier with the help of Technopolis, standard input and output key figures on four types of instruments have been compiled, analysed and reported. In doing so, we had the feeling we filled a white spot in endeavours to internationally align innovation indicators. In fact, although lots of endeavours have been made to align outcome level indicators (e.g. definitions of R&D and innovation in the OECD context of the so-called Frascati and Oslo Manuals), the alignment of indicators on innovation policy and programs was not intensively studied and discussed. The *second lesson* was that in developing a benchmark, the proof of pudding was in the eating. Although we already had studies definitions on key indicators, it was striking how many dilemmas and definition issues we came across during the process of delivering the data (see Box 5.1 for some issues we came across in the process of delivering the data).

Box 5.1 Issues in indicator definitions which came forward during the process of data delivery

1. The contracted budget rests on the contract decision and not to the actual payment(s).
2. For loans, we use the gross grant equivalent, instead of the sum of the loan.
3. We must be conscious that the following aggregation must be correct. Because we ran into examples where this was not the case we decided to add a category 'other'.

Contracted budget = contracted budget to enterprises + contracted budget to knowledge institutes + contracted budget to other organizations

4. It was difficult to come up with comparable figures of 'private sector contributions' because in some cases indirect contributions of private entities are also taken up. Therefore, we changed this indicator to 'recipients' own contribution' (irrespective of how and from which organizations recipients got that money from)
5. Clear distinction between number of grants (budget contract decisions), beneficiaries (unique organizations that receive money given the contract decision) and participants (unique organizations that participate in projects irrespective of the question whether they receive money or not)
6. We do not include the indicator beneficiaries for competence centers because of the fact that some agencies count the number of competence centres (already included in the indicator list) and some agencies use a subsection of the number of participants (only those participants that receive money)
7. The number of cooperation linkages should be calculated according to the following formula (with N as the number of participants in P projects) $C = \sum_P \frac{N(N-1)}{2}$
8. As the number of reimbursed vouchers is to be related to the number of issued vouchers it is important that the number of reimbursed vouchers is attributed to the year the voucher was issued (cohort analysis).
9. Both successful and unsuccessful application are attributed to the year the decision was made. The total number of applications is simply the sum of successful and unsuccessful applications.
10. All financial figures are reported in Euros. To recalculate, we use the average exchange rates of the particular calendar year

Even while writing the report, we still came across definition issues. For instance, we noticed some differences how different agencies deal with the question what determines a successful project application (applications that receive funding vs. applications that successfully go through the quality assessment of ex ante project evaluation) while

coherence in different agencies' calculation methods in cohort analysis (e.g. issued and reimbursed vouchers) and the calculation of project connections in cooperative R&D projects and projects in competence centres remain important points of attention.

The result of our learning exercise is the benchmark presented in Chapters 2 to 5. The *value of the benchmark* to its target audience (notably managers of innovation programs) is that it gives a first clue (in the form of a reference to compare results with) whether results of innovation programs are relatively high or low compared to programmes managed by European innovation agencies. For instance, if an innovation programmes' beneficiaries concern 40 percent SME and the question lies at the table how to involve even more SMEs in the program, a reader might turn to the report to find agencies with higher shares of SME beneficiaries and find first clues to which agencies to discuss the underlying reasons for this difference. However, figures and positions do not justify a normative interpretation (in terms of which agency performs 'the best' or which agencies are 'losing momentum' or 'staying behind'). Differences in results relate to differences in the design of the instrument and the context in which the programs are implemented. An illustrative example concerns the differences in impact (participants' own contribution in relation to the public budget contracted) which without an exception relates to maximum subsidy percentages in the programs under consideration. As was concluded in a previous study¹, in this sense, benchmarking different instruments is still a matter of comparing apples and oranges. Therefore, the added value of this benchmark report does not lie in giving answers, rather the added value lies in the generation of questions and first hints who to talk to in the search for answers to these questions.

The report does not provide definite answers and still more work has to be done on the interpretation of differences. This work surely is considered one of the main tasks for future benchmarking activities within Taftie. This work will undoubtedly benefit from structural benchmarking endeavours as longer time series will put more emphasis on structural differences and developments contrary to more accidental differences between innovation programs managed by different agencies.

¹ Technopolis (2014), In search for a benchmark of impact, effectiveness and efficiency of innovation instruments. A report for the Taftie Task Force on Benchmarking Impact, Effectiveness and Efficiency (TFBIEE)

Chapter 1 Introduction

1.1 Purpose

This report presents the main findings of a pilot project initiated by fourteen innovation agencies aimed at providing a comparative overview of key indicators of innovation programmes in Europe. Setting up a benchmark entails several underlying ambitions. Firstly, a benchmark gives a first insight in the added value of innovation programmes which form the core of the work of innovation agencies across Europe. Secondly, a benchmark gives an illustration of the possibilities gained through alignment of innovation indicators across European innovation agencies. Finally, as a comparative benchmark is not possible without discussions on monitoring frameworks and indicators definitions, mutual learning across European innovation agencies is a third objective behind the benchmark report.

1.2 Background

This report stems from Taftie, the European Network of Innovation Agencies. Important pillar of Taftie is mutual learning, accumulation and distribution of knowledge which is done through the Taftie Academy, Expert Sessions and Policy Conferences and Task Forces and Networks. Following the first steps of the Taftie Task Force on Benchmarking Impact, Effectiveness and Efficiency², Taftie agencies have jointly organised their benchmarking efforts in Taftie's Structural Network on Benchmarking (SNB) of which the ambitions are threefold (as stated above). Currently, the network consists of fifteen active members. See Table 1.1 for an overview of participating agencies including an overview of contact persons per agency. The coordination of the network is taken up by different agencies each year³.

Table 1.1 Participants of the Structural Network on Benchmarking

Organization	Country	Contact
Centre for the Development of Industrial Technology (CDTI)	Spain	Ascensión Barajas
Danish Agency for Science, Technology and Innovation (DASTI)	Denmark	Uffe Hoeg Andersen; David Boysen Jensen
Enterprise Estonia (EAS)	Estonia	Madis Truupõld
Enterprise Ireland (EI)	Ireland	Kevin Flynn
Austrian Research Promotion Agency (FFG)	Austria	Rafael Lata, Andreas Wildberger
Croatian Agency for SMEs, Innovations and Investments (HAMAG-BICRO)	Croatia	Mislav Jurišić
Luxinnovation	Luxemburg	Pascal Fabing
Agency for Science, Innovation and Technology (MITA)	Lithuania	Ričardas Valančiauskas
Research Council of Norway (RCN)	Norway	Paul Istvan Bencze; Kirsten Voje
Netherlands Enterprise Agency (RVO.nl)	Netherlands	Pieter de Bruijn; David Pullen
Polish Agency for Enterprise Development (PARP)	Poland	Zuzanna Popis
Slovak Innovation and Energy Agency (SIEA)	Slovakia	Renáta Magulová
Technology Agency of the Czech Republic (TA CR)	Czech Republic	Lukáš Kačena; Zbynek Ružicka
Tekes – the Finnish Funding Agency for Technology and Innovation	Finland	Teppo Tuomikoski
VINNOVA – the Swedish Governmental Agency for Innovation Systems	Sweden	Kentth Hermansson

² For an overview of the activities and results of the Task Force on Benchmarking Impact, Effectiveness and Efficiency (TFBIEE) which were produced in close cooperation with Technopolis Group, see <http://www.taftie.org/content/task-force-biee>.

³ RVO took up the coordination in 2016, FFG takes over in 2017, RCN in 2018 and Tekes in 2019.

1.3 Scope

This report summarizes key indicators of thirty-eight programmes managed by fourteen innovation agencies. The programmes cover four types of instruments aimed at innovative enterprises, namely grants aimed at (in-house) research, development and innovation (RDI), grants aimed at RDI cooperation, innovation vouchers and competence centres. Please note that most agencies included only a subset of their full programme portfolio in this benchmark exercise. The figures presented here are therefore not representative of agencies' full programme portfolio within the instrument types included in this benchmark. Also, although every effort was made to include the correct and up-to-date figures in the report, we cannot guarantee that all figures presented are free from mistakes or errors. See Table 1.2 for an overview of the programmes covered by the benchmark. The period covered by the benchmark is 2012-2014.

Table 1.2 Overview of programmes taken up in the benchmark

Agency	Instrument	R&D grant	Collaborative R&D grant	Innovation vouchers	Competence Centers
CDTI	CDTI Individual Business R&D Projects	x			
	CDTI Cooperative Business R&D Projects		x		
Dasti	Innovation Vouchers ¹			x	
	Danish Strategic Research Council – DSF ²		x		
	Innovation Consortia – IC ²		x		
	Danish National Advanced Technology Foundation – HTF ²		x		
EAS	Vouchers ³		x		
	Competence Centers ⁴				x
EI	Innovation partnerships		x		
	Innovation Vouchers			x	
	Technology Centres				x
FFG	R&D grant ⁵	x			
	Cooperative R&D grant ⁶		x		
	Innovation Voucher ⁷			x	
	Competence Centres ⁸				x
HAMAG-BICRO	R&D grants ⁹	x			
Luxinnovation	R&D grants under 2009 RDI Law	x			
MITA	Cooperative R&D grant		x		
	Innovation Voucher			x	
PARP	Measure 1.4 of Innovative Economy OP 2007-2013	x			
	Measure 4.1 of Innovative Economy OP 2007-2013	x			
	Vouchers: small ¹⁰			x	
	Vouchers: big ¹⁰			x	
RCN	Cooperative R&D grant ¹¹		x		

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Table 1.2 Overview of programmes taken up in the benchmark – continued from previous page

Agency	Instrument	R&D grant	Collaborative R&D grant	Innovation vouchers	Competence Centers
RVO.nl	SMEs Instrument Top Sectors: Feasibility Projects	x			
	SMEs Instrument Top Sectors: R&D Cooperation Projects		x		
	SMEs Instrument Top Sectors: Knowledge Vouchers			x	
	Top Consortia for Knowledge & Innovation				x
SIEA	R&D grant 1.1	x			
	R&D grant 1.3	x			
	Innovation Vouchers			x	
TA CR	ALFA		x		
	OMEGA		x		
	Competence Centres				x
TeKes	R&D grant for individual projects	x			
	R&D grant for cooperative projects		x		
	SHOKs				x

¹ from 2014 onwards part of the InnoBooster scheme

² in 2014 DSF, IC and HTF were restructured into the Innovation Fund Denmark.

³ Given the specific design of the instrument this scheme is taken up under the category of cooperative R&D grants to enhance comparability

⁴ As the data on EAS' Competence Scheme predominantly focus on 2008 and 2009 the data are included in the data file but not in this report which focuses on the period between 2012 and 2014

⁵ Einzelprojekt (BP) [C3-(E¹)]; Einzelprojekt (Energien 2020) [IF C3-(I²)]; FEMtech Forschungsprojekte (Talente) [IF C3-(I²)]; Einzelprojekt ASAP [GLF C3-(G³)]

⁶ Kooperationsprojekte (TP) [C4-(E-I⁴)]; EUREKA-Projekt, ERA-Net Projekte [C4-(E-I⁴)]; Kooperationsprojekt ASAP [C4-(E-I⁴)]; FEMtech Forschungsprojekte (Talente) [C4-(E-I⁴)]; Kooperationsprojekt ASAP [C4-(G)]

⁷ Innovationsscheck [C2-XS]; Innovationsscheck Plus [C2-S]

⁸ Comet (K2, K1) [C8]; Laura Bassi Centres of Expertise [C8]

⁹ Proof of Concept (POC)

¹⁰ 2008-2014 domestic funds; from 2015 within Smart Development OP 2014-2020

¹¹ BIA - Brukerstyrt innovasjonsarena; ENERGI - Stort program energi; MAROFF-2 - Maritim virksomhet og offsh-2; PETROMAKS2 - Stort program petroleum; EUROSTARS; BIONÆR - Bionæringsprogram; NANO2021 - Nanoteknologi og nye material; GLOBVAC - Global helse- og vaksinforskning; HAVBRUKS - Havbruk - en næring i vekst

1.4 Indicators

Necessary condition for producing a comparative overview of key figures of innovation programmes concerns discussion, agreement and alignment of innovation indicators. With the help of Technopolis Group, consensus was reached on a set of basic indicators (so-called primary set of indicators) on inputs, activities and outputs⁴. In the process of gathering data, a few details were elaborated and some minor changes were made at a workshop held in January 2016 in Brussels. The result is the primary set of indicators as used in this benchmark report. The indicators including their definitions are summarized in Table 1.3.

⁴ See Technopolis Group (2015), Measuring Innovation Policy Across Europe – Common Indicator Framework, pp. 8/9, available at <http://www.taftie.org/content/biec-reports-2015>.

Table 1.3 Primary set of indicators included in this report (adapted from Technopolis)

Element	Indicator	Definition and subindicators	R&D Grants	R&D Collaborative Grants	Innovation Vouchers	Competence Centres
INPUT INDICATORS: PUBLIC INVESTMENT						
Budget	Contracted Budget	Amount of funding <u>contracted</u> in year x - total - all enterprises - large enterprises - SMEs - knowledge institutions - other	X	X		X
Budget	Issued Budget	Value of issued vouchers in year x - total - all enterprises - large enterprises - SMEs - knowledge institutions - other			X	
Budget	Reimbursed Budget	Value of reimbursed vouchers in year x - total - all enterprises - large enterprises - SMEs - knowledge institutions - other			X	
THROUGHPUT INDICATORS: ACTIVITIES						
Managing and Operating Grants/ Competence Centres	Awarded Grants	Total number of awarded grants in year x	X	X		X
Managing and Operating Vouchers	Issued vouchers	Number issued vouchers in year x - total - all enterprises - large enterprises - SMEs - knowledge institutions - other			X	
Managing and Operating Vouchers	Reimbursed Vouchers	Number of reimbursed vouchers in year x - total - all enterprises - large enterprises - SMEs - knowledge institutions - other			X	
Managing and Operating Grants/ Vouchers	Application success rate	Application success rate	X	X	X	
Managing and Operating Grants/ Vouchers	Application success rate	Number of applications in year x - total ¹ - successful applications in year x - unsuccessful applications in year x	X	X	X	
Managing and Operating Vouchers	Reimbursement rate	Reimbursement rate			X	
Managing and Operating Vouchers	Reimbursement rate	- Number of issued vouchers in year x - Number of issued vouchers in year x			X	

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Table 1.3 Primary set of indicators included in this report (adapted from Technopolis) – continued from previous page

Element	Indicator	Definition and subindicators	R&D Grants	R&D Collaborative Grants	Innovation Vouchers	Competence Centres
Managing and Operating Vouchers	Number of Potential Beneficiaries	Number of unique (in a year; in the programme) organizations that vouchers are issued to in year x - total - all enterprises - large enterprises - SMEs - knowledge institutions - other			X	
Managing and Operating Grants/ Vouchers	Number of Beneficiaries	Number of unique (in a year; in the programme) organizations contracted for grants in year x / Number of unique (in a year; in the programme) organizations that reimbursed vouchers in year x - total - all enterprises - large enterprises - SMEs - knowledge institutions - other	X	X	X	
Managing and Operating Grants/ Competence Centres	Number of Participants ²	Number of unique (in a year; in the programme) organizations active in R&D projects contracted in year x / Number of unique (in a year; in the programme) organizations active in R&D projects in year x in the competence centres - total - all enterprises - large enterprises - SMEs - knowledge institutions - other		X		X
OUTPUT INDICATORS: RESULTS						
(Collaborative) R&D Projects	Private Contributions	Beneficiaries' <u>own</u> contribution ³ in euro contracted in year x - total - all enterprises - large enterprises - SMEs - knowledge institutions - other	X			
(Collaborative) R&D Projects	Private Contributions	Participants' <u>own</u> contribution in euro contracted in year x - total - all enterprises - large enterprises - SMEs - knowledge institutions - other		X		X
Specific R&D Cooperation Relations	Specific R&D cooperation relations	Number of participation relationships in projects contracted in year x - total - number of company - company relationships - number of company - knowledge institute relationships		X		X
Specific Knowledge & Technology Generation	Technical success of projects	Number of closed projects in year x - which achieved objectives as planned - which yielded results beyond planned objectives - which achieved its objectives partially - which failed to reach its objectives or were discontinued	X	X	X	X

¹ This is the sum of the successful and unsuccessful applications in year x. This means that the amount of decisions is counted, and not necessarily the amount of applications in year x.

² This indicator was added to emphasize a potential difference between 'beneficiaries' and 'participants': beneficiaries receive grants, whereas participants include organizations that contribute to a project, but may not necessarily receive grants.

³ Instead of the term 'private contribution' the term 'own contribution' was introduced. It aims to clarify the distinction between the grant of the agency for a project and the own contribution of the project participants. This own contribution can come from a variety of sources. The term 'private contribution' seems to imply that this contribution must necessarily stem from a private source, which is not always the case.

1.5 Contents

Chapter 2 to 4 focus on the benchmark results. The chapters are structured around the instrument types covered. Chapter 2 focuses on R&D grants, Chapter 3 focuses on grants for R&D collaboration, Chapter 4 focuses on innovation vouchers and Chapter 5 is focused on competence center programmes. Some concluding remarks are taken up in the summary and conclusions section on the first pages of the report.

Chapter 2 R&D grants

2.1 Introduction

R&D grants concern subsidy schemes with businesses as beneficiaries⁵. This benchmark focuses on ten programmes managed by eight innovation agencies (see Box 2.1 below). Given differences in scope (sectors, types of R&D), budget, criteria, target groups and design of the instruments we must be very cautious in interpreting the results. Although the indicators and definitions are the same across agencies and instruments (unless stated otherwise), differences in the context and design lead to a comparison between apples and oranges.

In this chapter the comparison is made between the programmes' size in terms of budget, number of grants and beneficiaries. Additionally, the extent to which public budgets relate to private R&D investments (beneficiaries' own contributions) in the projects funded is analyzed. Finally, the share of SMEs in the total number of beneficiaries is taken up.

Box 2.1 R&D grants included in the benchmark

- CDIT's Individual Business R&D projects provide funding in the form of soft loans, granted at an interest rate below market rates. The soft loan may have a non-reimbursable part (a grant). Up to 85 percent of eligible project costs may be financed.
- FFG's R&D grant is a combination of four specific programmes focused on single firm project funding, either in generic sense (Einzelprojekt (BP) [C3-(E1)]), or in relation to the future of energy (Einzelprojekt (Energien 2020) [IF C3-(I2)]), gender issues in technology and innovation (FEMtech Forschungsprojekte (Talente) [IF C3-(I2)]) or space applications (Einzelprojekt ASAP [GLF C3-(G3)]).
- HAMAG-BICRO's Proof of Concept (POC) programme is focused both on SMEs and public research institutions.
- The R&D grants provided by the Luxembourg Ministry of the Economy with the support of Luxinnovation aim at supporting Luxembourg companies in their R&D efforts. It is a bottom-up scheme meaning that companies can apply any time. Projects are carried out by companies, possibly in collaboration with external partners.
- The programmes managed by PARP as part of the Innovative Economy Operational Programme 2007-2013 concern the research stage (Measure 1.4) and implementation stage (Measure 4.1) of R&D. Both programmes are aimed at entrepreneurs, either on their own, in a consortium or in cooperation with public research institutions.
- Feasibility projects is a subcategory within the Top Sector SME Instrument which is carried out by RVO.nl in close cooperation with national and regional authorities. They are aimed at SMEs to map out all technical and economic risks of future innovation projects (through, for instance literature and patent survey, market analysis). They concern feasibility study, possibly complemented by industrial research or experimental development. The maximum funding amounts to 40% of eligible costs with a maximum of EUR 50.000.
- The aim of SIEA's *R&D grant 1.1* (Support for innovation and technology transfers) is to support the private sector in order to increase innovation and ensure technology transfer to SMEs in the form of financial assistance from the EU structural funds and the state budget. Support also contributes to reducing the energy intensity of production, reducing environmental impacts of industrial activity and increasing production efficiency, thereby ensuring increased competitiveness of industry and services, the growth of value added and sales of own products and services. In addition to technology transfer and innovation it is expected to create new jobs by promoting entrepreneurship, with a special emphasis on young unemployed people under 29 years. The maximum intensity of aid granted to the recipient was dependent on the size of the enterprise and the corresponding region of the Slovak Republic and reached 40% -70% of eligible costs.

⁵ With the exception of CDIT's Individual Business R&D projects which comprises a combination of both loans and grants

The aim of *R&D grant 1.3* (Support of innovation activities in enterprises) is to provide state assistance to projects of industrial research and experimental development focused on innovation in the form of financial assistance from the EU structural funds and the state budget aimed at supporting the development and enhancing the competitiveness of businesses in research and development, production, business economy and related services. The maximum intensity of aid granted to the recipient was dependent on the size of the enterprise and the corresponding region of Slovakia. In the case of industrial research reached 40% -50% of eligible costs and experimental development from 25 to 45% of eligible costs.

- Tekes' R&D grants comprise both R&D projects for companies for creating new knowledge and competence to serve as a basis for future business and strategic research openings for research organizations (the latter being discontinued since 2015). Although the programmes comprise both grants and loans, in the context of this benchmark report the loans are excluded from the analysis.

2.2 Financial size

Figure 2.1 shows the total financial project size of the programmes in the years 2012, 2013, and 2014. A distinction is made between public funding and participants' own contribution. It is important to note that CDTI provides soft loans for individual R&D projects. For CDTI, the figures represent the so-called Gross Grant Equivalent, which takes into account the non-reimbursable part of the stimulus and the difference between the interest rate and the actual rate on commercial markets. All other figures on public funding relate to grants. Participants' own contributions added up to the amount of public funding lead to the total size of R&D projects subsidized.

For the total financial size of R&D projects that benefitted from R&D grants, differences between agencies' programmes are considerable. For instance, FFG and CDTI's programmes account for around 500 million Euro in R&D projects, whereas the size of RVO.nl and HAMAG-BICRO's programmes amounts to 12 and 2 million euro respectively. These differences do not say anything about the importance of the agency in the national innovation system or about the country's R&D performance. The figures only relate to specific programmes for which agencies decided to involve them in this benchmark exercise.

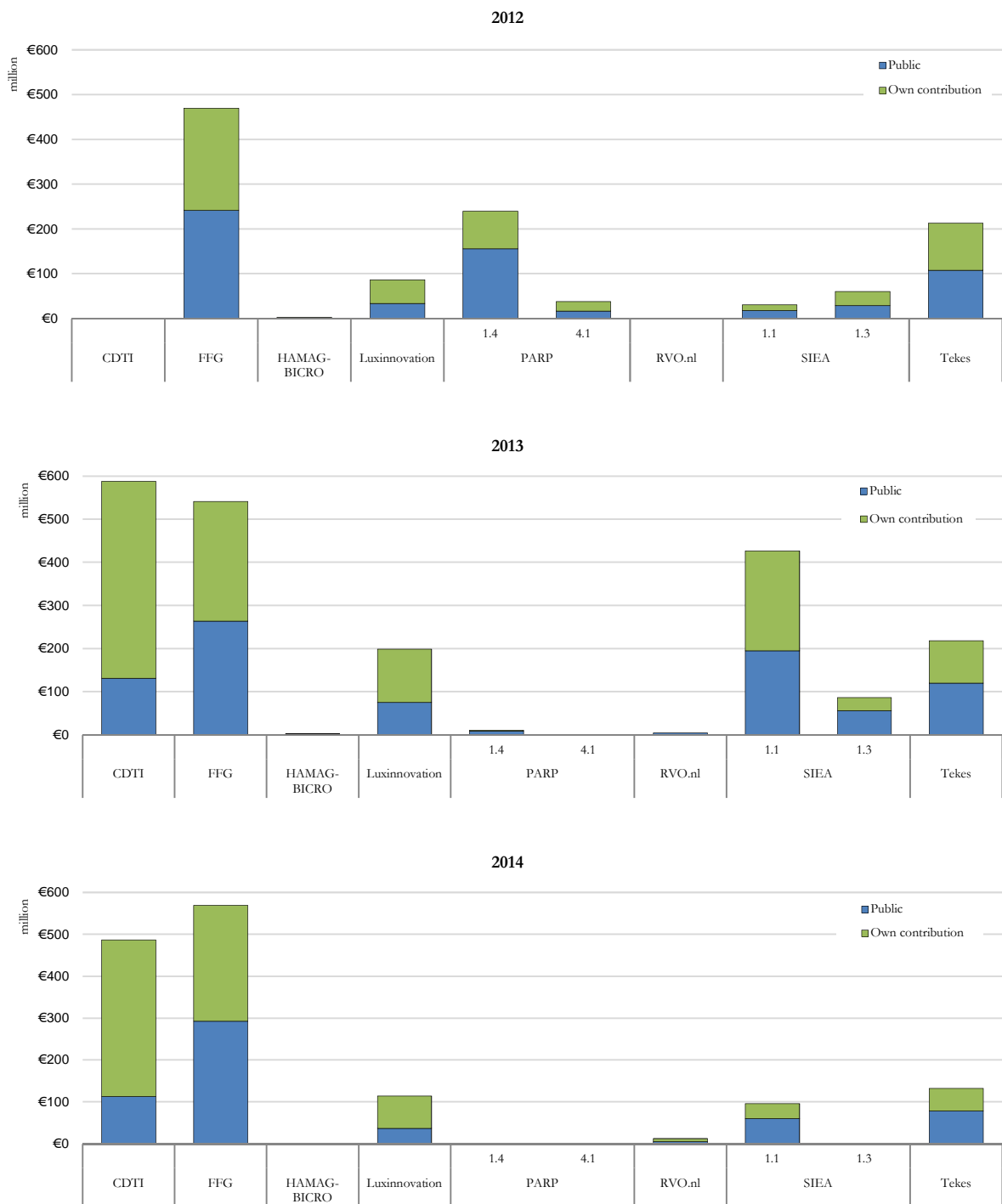
Apart from the size, the programmes also differ in relation to the financial distribution over the years. For instance, the size of FFG's and Tekes' grants is quite stable over the years, as is the case for CDTI's soft loan for R&D business projects. For Tekes, the size of R&D grants is reduced in 2014 (by roughly one third from 120 000 in 2013 to 78 000 euro in 2014). Luxinnovation's commitments on R&D grants (and the total size of the R&D projects) in 2013 were roughly twice the size of the spending in 2012 and 2014. For PARP and SIEA's instruments (notably PARP's Measure 1.4 on the Research Phase and SIEA's 1.1 programme) the distribution is even more uneven with peaks in 2012 (PARP 1.4⁶) and 2013 (SIEA 1.1).

Figure 2.2 focuses on the extent to which public grants evoke private investments in R&D. In this benchmark exercise, we did not compare private investment as such but focused on participants' own contributions instead – partly to also include own contributions from public research institutions and partly to prevent discussions on how and from which sources recipients obtained the money themselves (to keep track of the origin – private or public – of the money). To compare agencies' innovation programmes on the extent to which grants evoke private and other public investments in R&D Figure 2.2 depicts the index of participants' own contributions divided by the amount of public grants invested from the agency's side.

By far, the extent to which public grants evoke other investments in R&D projects is highest for CDTI. As CDTI individual business R&D projects are the only projects in this benchmarking exercise which are stimulated by a soft loan instead of a grant, this result is not surprising. For CDTI, the index amounts to 3.4 (3.5 in 2013 and 3.3 in 2014). Also, Luxinnovation's and RVO.nl grants index figure are relatively high with values over 1.5.

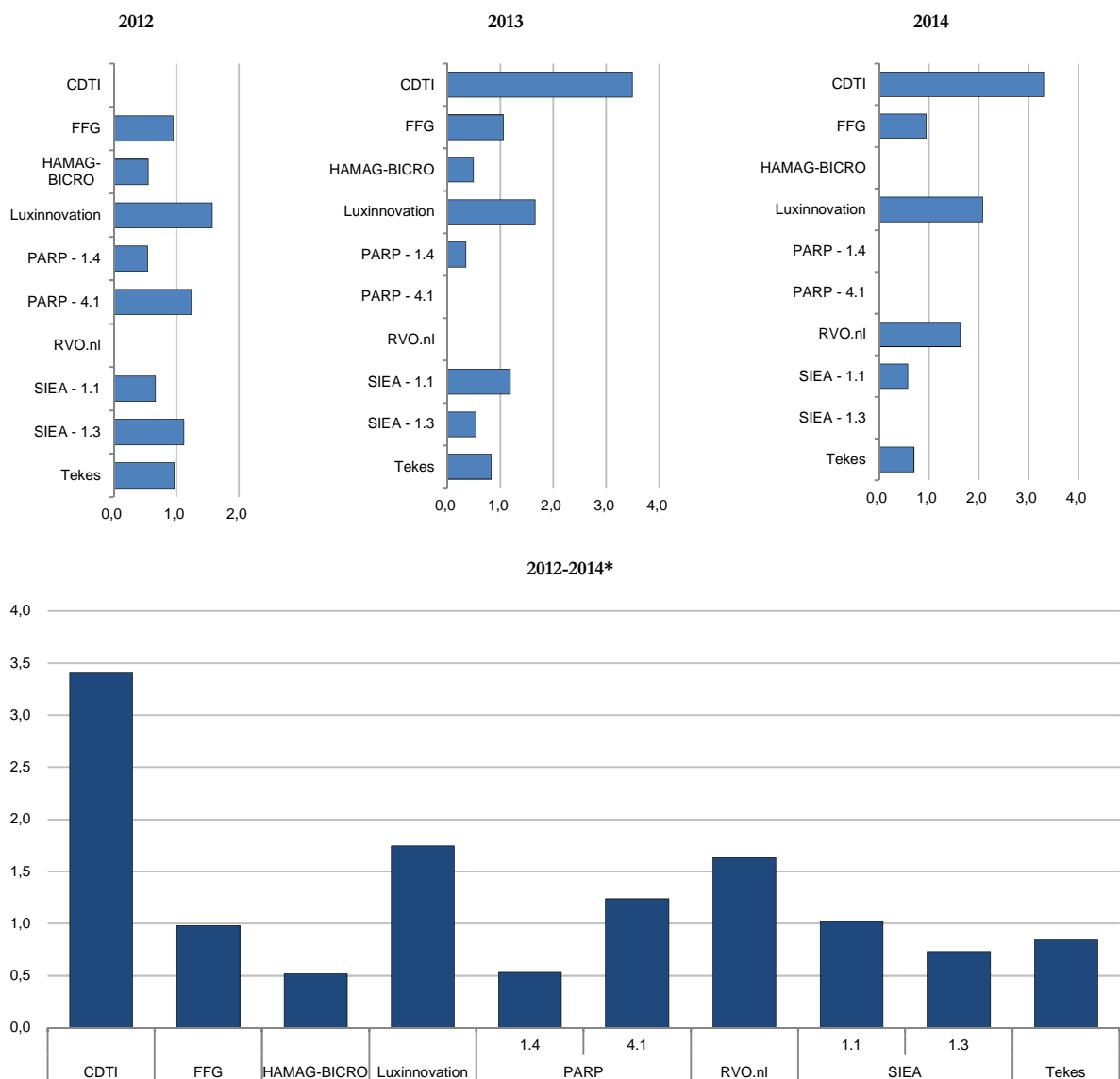
⁶ In 2012 implementation of the Measures 1.4-4.1 Innovative Economy OP 2007-2013 was moved to another institution: The National Centre for Research and Development. All the data included concern beneficiaries from 2008-2011 application rounds.

Figure 2.1 Financial size of R&D projects (public contribution and participants' own contribution), 2012-2014



This means that every euro spent on public grants evokes 1.74 euro (Luxinnovation) and 1.63 euro (RVO.nl) additional contribution by project participants. For Luxinnovation, this impact has increased over the years with indexes of 1.57 (2012), 1.65 (2013) and 2.08 (2014). It is important to note that differences in these indexes between agencies often relate to the design of the programmes. For instance, in most cases, maximum rates of funding in relation to eligible project costs apply. Differences relate to the nature of the R&D projects stimulated and/or the target group. Agencies make a distinction between the maximum rates for fundamental research, industrial research and experimental development, SMEs and startup, and/or whether the project is conducted within a single company or in collaboration with other entities. Exemplary is for instance the difference between PARP's Measures in the research stage (1.4) and the implementation phase (4.1). As one might expect, the own contribution per public euro invested is much higher in the implementation phase close to the market than in the research phase (1.24 opposed to 0.53).

Figure 2.2 Impact – participants' own contribution per Euro public investment (Euro), 2012-2014



*the average over 2012-2014 is dependent on data availability and covers 2012 and 2013 for HAMAG BICRO's R&D grant, PARP 1.4 and SIEA 1.3 programmes; 2013 and 2014 for CDTI individual business R&D projects; 2012 for PARP 4.1 programme and 2014 for RVO.nl's SMEs Top Sector projects

Table 2.1 presents these impact figures for each target group (small and medium-sized versus large enterprises and knowledge institutions). For all agencies granting subsidies to both knowledge institutions and business enterprises, the impact – in terms of recipients’ own contribution per euro subsidy granted – is higher for enterprises than it is for knowledge institutions (0.61 against 0.99 for FFG’s R&D grants, 0.41 against 0.63 for HAMAG-BICRO’s programmes and 0.46 against 1.29 for Tekes’ R&D grants). In a same manner, the impact for large enterprises is generally higher than it is for SMEs. These differences directly relate to differences in the design of the instruments, specifically the maximum amount of subsidy, which for most agencies is given as a percentage in total project costs. This maximum percentage is generally higher for knowledge institutes (and for fundamental research) than it is for companies (and industrial research or experimental development). The same applies to the maximum percentage of funding for SMEs and large enterprises. Self-evidently, the higher this maximum percentage is, the lower is the own contribution of recipients needed and the lower is the impact in terms of own contribution per euro subsidy granted.

Table 2.1 Impact – participants’ own contribution per Euro public investment (Euro), by target group, 2012-2014*

	Total	Enterprises	SMEs	Large Enterprises	Knowledge Institutions	Other Entities
CDTI	3,40	3,40	3,05	3,67	-	-
FFG	0,98	0,99	0,72	1,12	0,61	0,67
HAMAG-BICRO	0,52	0,63	0,63	-	0,41	-
Luxinnovation	1,74	1,74	0,93	1,98	-	-
PARP - 1.4	0,53	na	na	na	na	-
PARP - 4.1	1,24	1,24	na	na	-	-
RVO.nl	1,63	1,63	1,63	-	-	-
SIEA - 1.1	1,02	na	na	na	na	na
SIEA - 1.3	0,73	na	na	na	na	na
Tekes	0,84	1,29	1,29	-	0,46	-

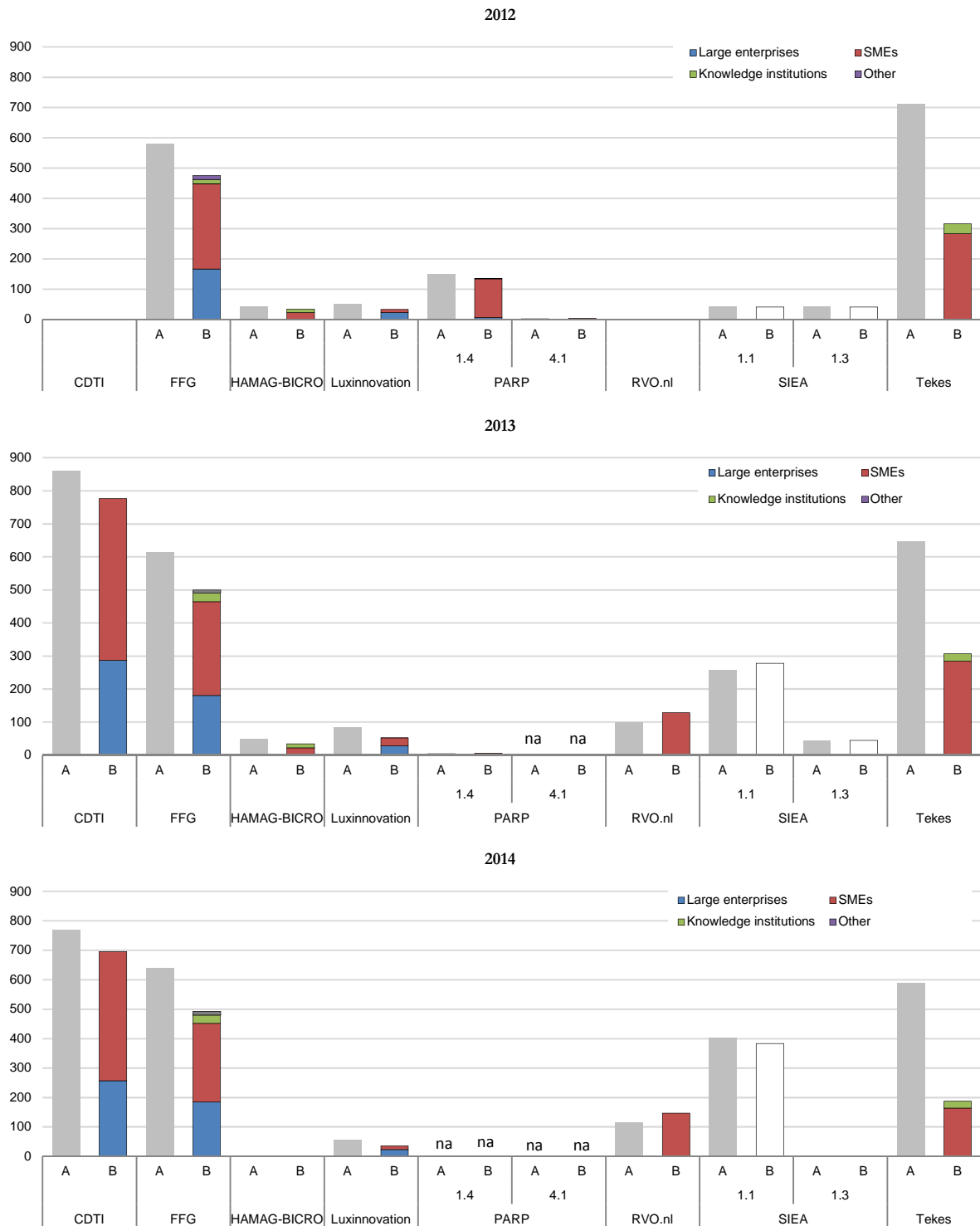
*the average over 2012-2014 is dependent on data availability and covers 2012 and 2013 for HAMAG BICRO’s R&D grant, PARP 1.4 and SIEA 1.3 programmes; 2013 and 2014 for CDTI individual business R&D projects; 2012 for PARP 4.1 programme and 2014 for RVO.nl’s SMEs Top Sector projects

2.3 Beneficiaries

In Figure 2.3 numbers of awarded grants and unique beneficiaries are depicted. The beneficiaries are broken down in SMEs, large enterprises, knowledge institutes and other types of beneficiaries. The large financial size of R&D projects Of FFG’s, CDTI’s and Tekes’ R&D projects coincides with a high number of awarded grants for the same instruments (around 800 for CDTI’s, 600 for both FFG’s and Tekes’ R&D programmes). In this respect, a remarkable figure is the number of grants awarded within the SIEA 1.1 programme in 2013, as the budget in that same year was quite limited (SIEA’s 1.1 programme’s budget dropped by a factor four from 430 million euro in 2013 to 96 million euro in 2014 while at the same time the number of awarded grants rose dramatically from 258 in 2013 to 404 in 2014).

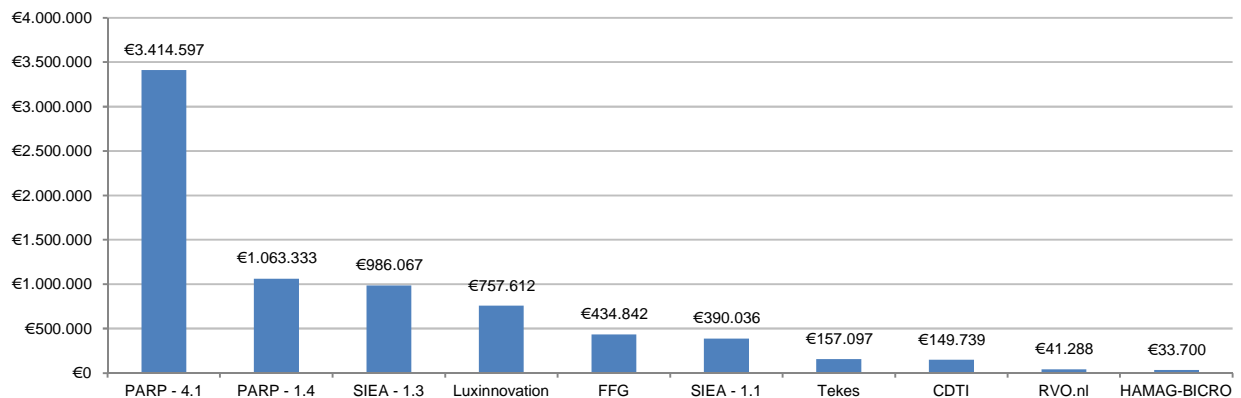
Numbers of awarded grants and beneficiaries are generally quite in line with each other. For most agencies the number of beneficiaries are slightly lower than the number of awarded grants, which is an indication that beneficiaries may receive multiple grants. The average number of grants per beneficiary amounts to roughly 1.0-1.6, with the exception of Tekes and RVO.nl. For Tekes, the number of grants per beneficiary amounts to 2.4. For RVO.nl the number of unique beneficiaries is actually slightly *higher* than the total number of awarded grants, indicating the possibility that grant decisions may involve several beneficiaries.

Figure 2.3 Number of awarded grants (A) and unique beneficiaries (B)*, 2012-2014



* for SIEA's 1.1 and 1.3 R&D programmes a breakdown into categories of beneficiaries is not available. Hence, the beneficiaries of these programmes are shown by a white coloured bar in the chart.

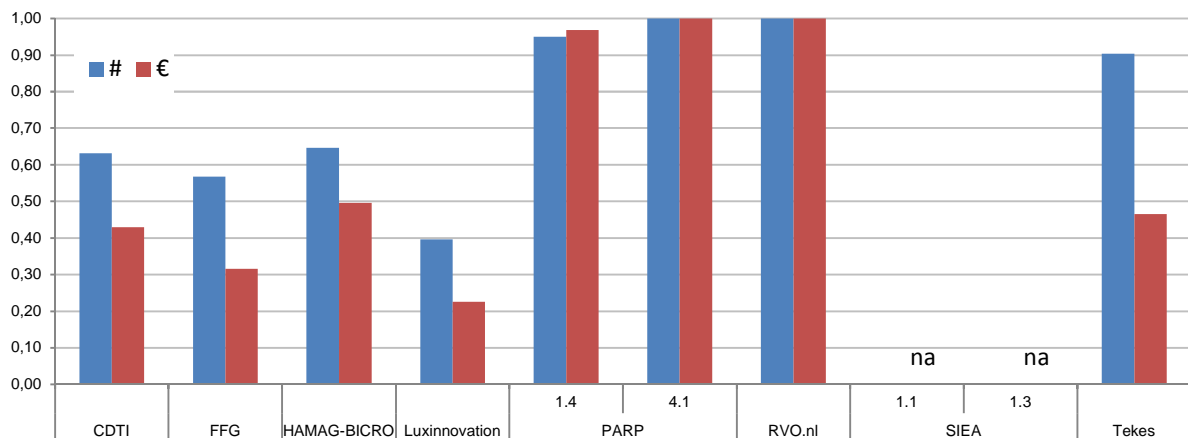
Figure 2.4 Average grant size (euro), 2012-2014*



*the average over 2012-2014 is dependent on data availability and covers 2012 and 2013 for HAMAG BICRO's R&D grant, PARP 1.4 and SIEA 1.3 programmes; 2013 and 2014 for CDTI individual business R&D projects; 2012 for PARP 4.1 programme and 2014 for RVO.nl's SMEs Top Sector projects

The average size of the grants (in terms of contracted budget per grant) is depicted in Figure 2.4. The average financial size of each grant turns out to differ enormously between the programmes included in the benchmark. The average financial size per grant ranges from over 1 million euro (PARP 4.1 Measure 3.4 million euro and 1.4 with 1.1 million euro; SIEA 1.1 programme 986 thousand euro) to around 40 thousand euro (HAMAG-BICRO with 34 000 euro per grant and RVO.nl with an average amount of 41 000 per grant). The average financial size of the grants turn out to be quite high. With the exception of RVO.nl's and HAMAG-BICRO's R&D individual business programmes, the average value of the grants for each instrument included in the benchmark turns out to be more than 100 thousand euros.

Figure 2.5 Small and medium sized enterprises: number of SME beneficiaries as a share in the total number of unique beneficiaries (#); contracted budget to SMEs, as a share in total contracted budget (€), 2012-2014*



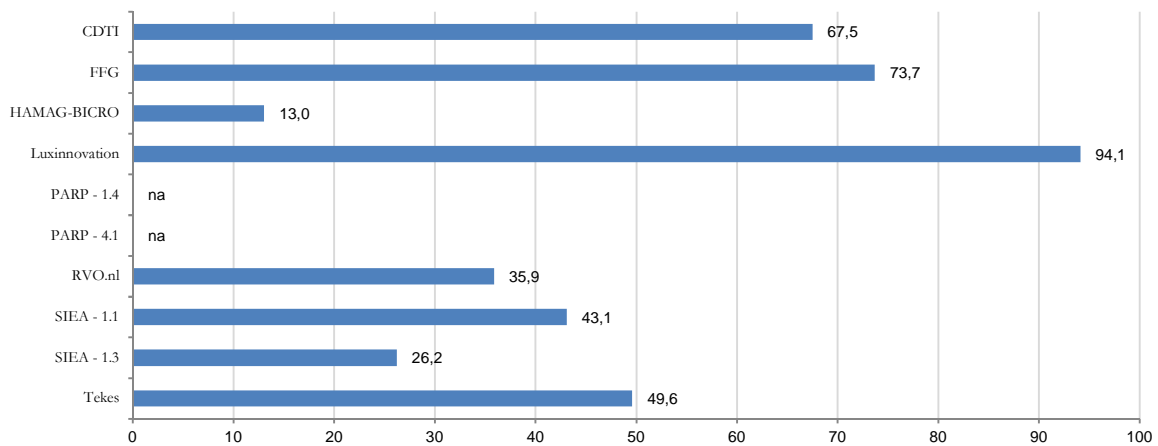
*the average over 2012-2014 is dependent on data availability and covers 2012 and 2013 for HAMAG BICRO's R&D grant, PARP 1.4 and SIEA 1.3 programmes; 2013 and 2014 for CDTI individual business R&D projects; 2012 for PARP 4.1 programme and 2014 for RVO.nl's SMEs Top Sector projects

Figure 2.5 depicts the importance of SMEs in the R&D programmes included in the benchmark, both in terms of the share of SMEs in the total number of beneficiaries and in terms of the amount of funding SMEs receive as a share in total contracted budget. PARP's 4.1 programme and RVO.nl's feasibility projects are exclusively focused on SMEs. Of all other programmes the share of SMEs, both in terms of numbers of beneficiaries and in terms of amount of subsidy received, is highest for PARP's 1.4 Measure. Here, 95 percent of all beneficiaries receive 97 percent of the subsidy amount awarded. For most agencies, the importance of SMEs is higher in terms of numbers of recipients than in terms of money received by SMEs. Especially for Tekes this difference is remarkable. Although more than 90 percent of all recipients can be considered SME, these same companies receive less than half of the budget contracted.

2.4 Application success rates

In Figure 2.6 information on the success rate of proposals for each programme is given. The success rate is defined as the number of successful proposals (proposals which are granted subsidy) divided by the total number of both successful and unsuccessful proposals. It is beyond doubt that application success rates differ enormously between the programmes included in the benchmark of individual business R&D programmes. With 68 and 74 percent the success rate of CD'TI's and FFG's R&D programmes is relatively high. Luxinnovation's R&D grant stands out with a success rate of 94 percent. A high rate might be an indication that proposers are well guided in preparing their proposals and that criteria for acceptance are well defined, communicated and understood. On the other hand, for the individual R&D programme of HAMAG-BICRO and SIEA's 1.3 programme, a relatively high number of applications is not accepted for a grant, given the relatively low application success rates of 13 and 26 percent⁷. A low success rate might be an indication of the popularity of the programme in the target group and the possibility that programme management can be quite critical on the quality of the proposals. Both high and low success rates have their positive and negative sides. For a normative interpretation of success rates more insight in the design of the instrument, the size of the budget and the size and qualities of the target group must be taken into account.

Figure 2.6 Success rates: number of successful proposals as a share in the total number of (both successful and unsuccessful) proposals (%), 2012-2014



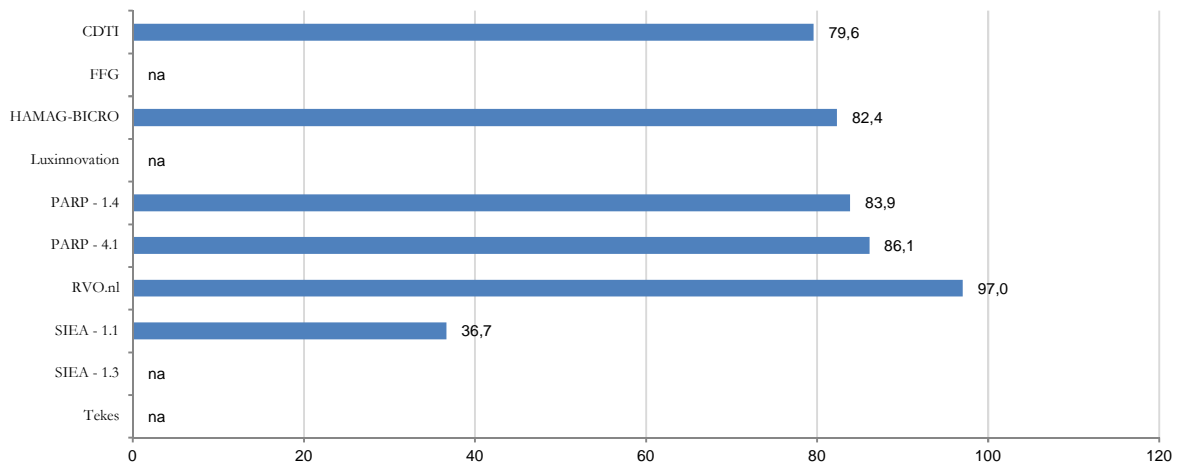
*the average over 2012-2014 is dependent on data availability and covers 2012 and 2013 for HAMAG BICRO's R&D grant, PARP 1.4 and SIEA 1.3 programmes; 2013 and 2014 for CD'TI individual business R&D projects; 2012 for PARP 4.1 programme and 2014 for RVO.nl's SMEs Top Sector projects

⁷ In case of HAMAG-BICRO this rate is low because the applications in the pre-application phase are also included in the total number of applications.

2.5 Results

The technical success of projects is defined as the number of projects which achieved objectives as planned or beyond planned objectives as a share in the total number of closed projects. For R&D grants the technical success is given in Figure 2.7. In general, the index ranges between eight and ninety percent, with the exception of RVO.nl SME Top Sector feasibility studies and SIEA 1.3 programme. The high success rate of RVO.nl's grant (97 percent) can be explained by the fact that objectives are stated in a more flexible way since it concerns feasibility studies rather than full-fledged R&D projects.

Figure 2.7 Technical success, 2012-2014



*the average over 2012-2014 is dependent on data availability and covers 2012 and 2013 for HAMAG BICRO's R&D grant and PARP 1.4 programme; 2013 and 2014 for CDTI individual business R&D projects; 2012 for PARP 4.1 programme and 2014 for RVO.nl's SMEs Top Sector projects

Chapter 3 R&D Collaboration -grants

3.1 Introduction

R&D collaboration grants concern subsidy schemes with cooperating businesses and/or knowledge institutes as beneficiaries⁸. This benchmark focuses on thirteen programmes managed by ten innovation agencies (see Box 3.1 below). As with R&D grants in general, given differences in scope (sectors, types of R&D), budget, criteria, target groups and design of the instruments we must be very cautious in interpreting the results. Although the indicators and definitions are the same across agencies and instruments (unless stated otherwise), differences in the context and design lead to a comparison between apples and oranges.

In this chapter the comparison is made between the programmes' size in terms of budget, number of grants, beneficiaries and participants. Additionally, the extent to which public budgets relate to private R&D investments (beneficiaries' own contributions) in the projects funded is analysed. Finally, the share of SMEs in the total number of beneficiaries is taken up.

Box 3.1 R&D collaboration grants included in the benchmark

- CDIT's Cooperative Business R&D projects provide funding in the form of soft loans, granted at an interest rate below market rates. Proposals are submitted by a group of cooperating businesses (two to six independent businesses). The soft loan may have a non-reimbursable part (a grant). Up to 85 percent of eligible project costs may be financed.
- Innovation Fund Denmark's Grand Solutions scheme was established in 2014 out of its predecessors Danish Strategic Research Council (DSF), Innovation Consortia (IC) and Danish National Advanced Technology Foundation (HTF). It typically focuses on large scale collaborative projects with multiple parties in a public-private partnership in which the focus is on research, development and/or commercialisation. Up to 2014, the primary focus of the Danish Council for Strategic Research (DSF) was to promote excellent and research relevant to society to the benefit of future development and economic growth in Denmark; Innovation Consortia supported and facilitated collaboration projects between firms, research institutions and non-profit advisory and knowledge dissemination parties to the benefit of Danish firms, notably SMEs; the Danish National Advanced Technology Foundation (HTF) offered private firms and universities the funds and the framework for developing new and important technologies.
- Enterprise Estonia's voucher scheme has been taken up in the category of R&D collaboration project since it does not actually relate to a voucher in the sense of a cheque that has to be reimbursed in order to convert it to conventional money, but relates to (a relatively small) budget which is granted through a relatively straightforward, simpler and easy application procedure. The scheme has a broad scope in the sense that – apart from collaborative R&D in a strict (Frascati) sense, also innovation services like innovation consulting, design solutions, feasibility, testing, patent registration and consulting are eligible for funding. Up to 80 percent of the costs is eligible for funding to a maximum of 4 000 euro. The voucher scheme is focused on short-term collaboration projects (up to twelve months).
- Enterprise Ireland's Innovation Partnerships Scheme encourages Irish-based companies to work with Irish research institutes resulting in mutually beneficial co-operation and interaction. Companies can access expertise and resources to develop new and improved products, processes, services, and generate new knowledge and know-how. The scheme provides grants of up to 80 percent towards eligible costs of the research project.

... to be continued on next page

⁸ CDIT's Cooperative Business R&D projects comprise a combination of both loans and grants

Box 3.1 R&D collaboration grants included in the benchmark – continued from previous page

- FFG's cooperative R&D grant is a combination of five specific programmes focused on cooperative R&D funding (Kooperationsprojekte (TP) [C4-(E-I4)]; EUREKA-Projekt, ERA-Net Projekte [C4-(E-I4)]; Kooperationsprojekt ASAP [C4-(E-I4)]; FEMtech Forschungsprojekte (Talent) [C4-(E-I4)]; Kooperationsprojekt ASAP [C4-(G)]).
- MITA's cooperative R&D grant promotes commercialization of ideas and technologies based on R&D results. It encourages researchers and students to establish start-up or spin-off companies and develop new products or services. A newly founded company must cooperate with a research institution and may receive up to 20 000 euro for a one year's period.
- RCN cooperative R&D funding concerns nine programmes. Apart from the generic Eurostars programme focussing on international cooperation these involve eight thematic programmes - BIA - Brukerstyrt innovasjonsarena; ENERGIX - Stort program energy; MAROFF-2 - Maritim virksomhet og offsh-2; PETROMAKS2 - Stort program petroleum; BIONÆR – Bionæringsprogram; NANO2021 - Nanoteknologi og nye material; GLOBVAC - Global helse- og vaksin.forsk; HAVBRUKS - Havbruk - en næring i vekst. The RCN data includes only these programs and is therefore not representative of the full RCN cooperative R&D funding portfolio.
- RVO.nl's R&D cooperation projects is a subcategory within the Top Sector SME Instrument which is carried out by RVO.nl in close cooperation with national and regional authorities. R&D Cooperation projects are aimed at the development of new products, processes and/or services and are carried out by a consortium of companies with at least two SMEs (only the costs at SME entrepreneurs are considered to be eligible for funding). In 2014, the grant amounts to 35 percent of the total eligible project costs. The Maximum amount in 2014 is 200 000 euro with a maximum of 100 000 per SME participant. For 2013, the subsidy rate is 40 percent, with a maximum amount of 150 000 euro.
- TA CR's ALFA and OMEGA programmes focus on cooperative R&D in advanced, technologies, materials and systems, energy resources and environment and sustainable transport (ALFA) and applied social sciences (OMEGA). Both programmes are aimed at joint activities of business entites and research organizations. Maximum funding (which is specified to the character of cooperation, the character of R&D and the size of the applicant enterprise) amounts to maximum 80 percent of eligible project costs.
- Tekes' cooperative part of their R&D grants comprise Grants for research and creation of new knowledge for large companies and, secondly, Public research networked with companies. As large companies must spend at least 40 percent of total project costs on acquiring services from SMEs or research organisations, or the project must be carried out as a genuine joint project with SMEs and research groups, the scheme is taken up under the category of R&D collaboration projects. In the context of this benchmark report the loans are excluded from the analysis.

3.2 Financial size

Figure 3.1 shows the total financial project size of the programmes in the years 2012, 2013, and 2014. A distinction is made between public funding and participants' own contribution. As is the case with individual R&D projects, CDTI provides soft loans – and not grants – for collaborative R&D projects. For CDTI, the figures represent the so-called Gross Grant Equivalent, taking into account the non-reimbursable grant part of the stimulus and the difference between the interest rate and the actual rate on commercial markets. All other figures on public funding relate to grants. Participants' own contributions added up to the amount of public funding lead to the total size of R&D projects subsidized.

For the total financial size of R&D projects that benefitted from the collaborative R&D grants taken up in this benchmark exercise, differences between agencies' programmes are considerable. RCN's and Tekes' collaborative R&D projects stand out in this respect, with a total financial size in a range between 300 and 400 million euros annually. On the other hand, MITA's collaborative R&D programme does not exceed 1 million euros annually in financial size. In comparison with the other instruments taken up in the benchmark, also Enterprise Estonia's cooperative R&D programme (marketed as innovation voucher scheme), Enterprise Ireland's Innovation Partnership Scheme and TA CR's OMEGA programme are quite modest in size (total financial size does not exceed 10 million euros in a year).

The period taken under consideration is a bit short to draw firm conclusions on trends over the years. During 2012 to 2014 however, the collaborative R&D programmes of RCN decrease in size (from 405 million euro in 2012 to 284 million euro in 2014), whereas the size of Tekes' cooperative R&D programmes increased from 315 to 379 million euro in the same period. With regards to RCN this decrease is an artefact caused by the selection of projects and programs included in the benchmarking exercise. The total collaborative R&D programmes funding of RCN increased both from 2012 to 2013 and from 2013 to 2014.

Figure 3.1 Financial size of R&D collaboration projects (public contribution and participants' own contribution), 2012-2014

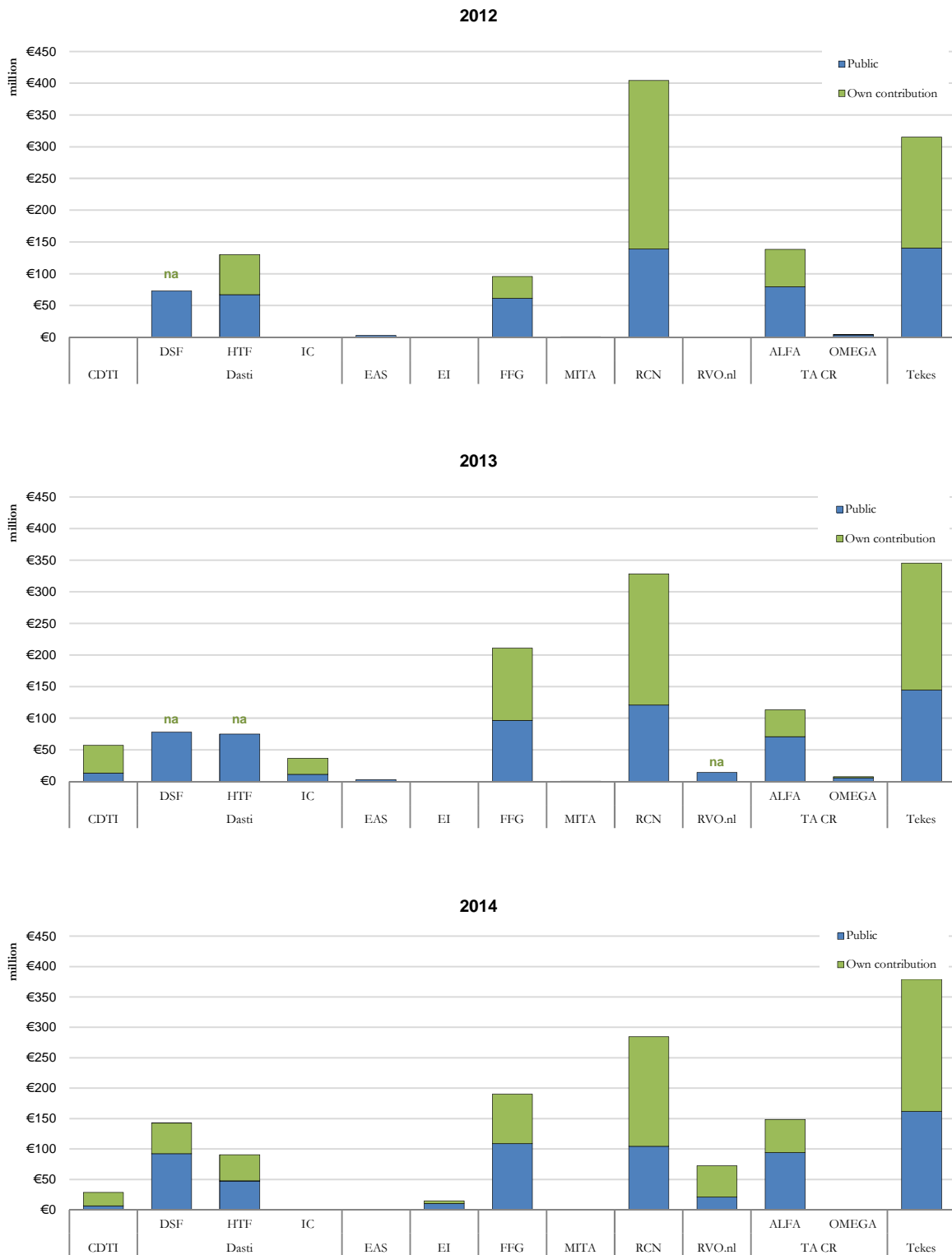
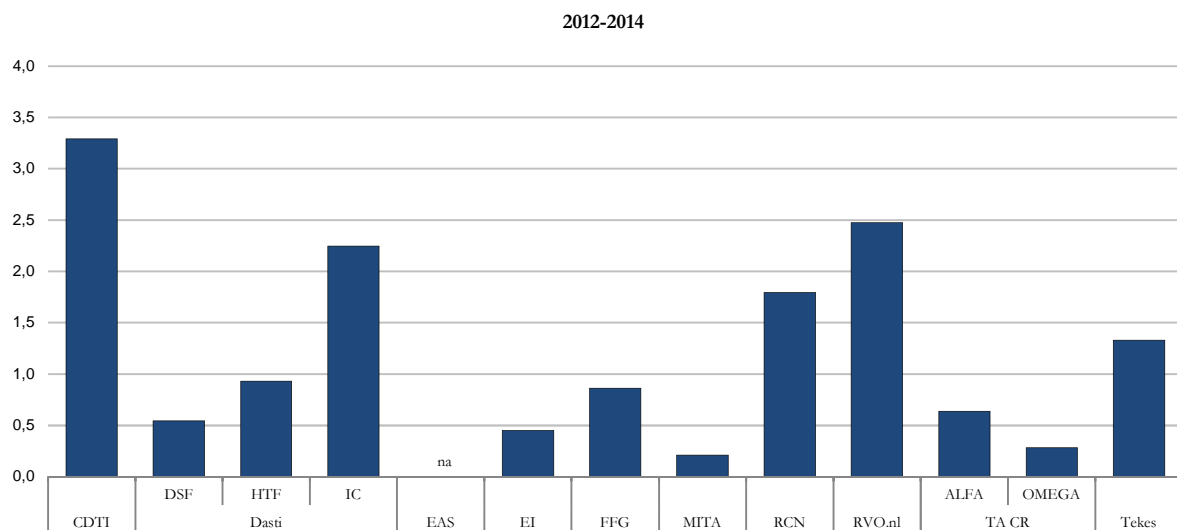


Figure 3.2 focuses on the extent to which public grants evoke private investments in R&D in terms of the financial value of project participants' own contribution per euro public funding⁹. As is the case for individual R&D programmes, also for cooperative R&D programmes the extent to which public grants evoke other investments in R&D projects is highest for CDTI with an index of 3.3. As CDTI cooperative business R&D projects are the only projects in this benchmarking exercise which are stimulated by a soft loan instead of a grant, this result is not surprising. Also, for the cooperative R&D programmes managed by RVO.nl, RCN, Tekes and Dasti's Innovation Consortia programme, participants' own contributions outweigh the public investment from the side of the government. In general, differences in these indexes between agencies often relate to the design of the programmes. For instance, in most cases, maximum rates of funding in relation to eligible project costs apply. Differences relate to the nature of the R&D projects stimulated and/or the target group. As such, it is not surprising that impact indices are quite stable over time. Only for FFG's cooperative R&D programmes participants' own contribution per euro public funding, varies considerably over the years (0.6 in 2012, 1.2 in 2013 and 0.7 in 2014).

Figure 3.2 Impact – participants' own contribution per Euro public investment (Euro), 2012-2014*



*the average over 2012-2014 is dependent on data availability and covers 2012 and 2013 for TA CR's OMEGA programme; 2012 and 2014 for Dasti's HTF programme; 2013 and 2014 for CDTI's cooperative business R&D soft loans; 2013 for Dasti's Innovation Consortia programme and 2014 for Enterprise Ireland's Innovation Partnership Programme and RVO.nl's R&D top sector cooperation projects.

Table 3.1 depicts participants' own contributions by target group as an index to the contracted budget to each of these groups (small and medium-sized versus large enterprises and knowledge institutions). The conclusions for cooperative R&D programmes are – in rough lines - the same as the conclusions drawn for individual business R&D projects. For all agencies granting subsidies to both knowledge institutions and business enterprises, the impact – in terms of recipients' own contribution per euro subsidy granted – is higher for enterprises than it is for knowledge institutions (e.g. 1.2 against 0.1 for TA CR's ALFA programme). In a same manner, the impact for large enterprises is generally higher than it is for SMEs (e.g. 1.5 against 0.6 for FFG's cooperative R&D programmes). In general, these differences relate to differences in the design of the instruments, specifically the maximum amount of subsidy, which for most agencies is given as a percentage in total project costs. This maximum percentage is generally higher for knowledge institutes (and for fundamental research) than it is for companies (and industrial research or experimental development). The same applies to the maximum percentage of funding for SMEs and large enterprises. Self-evidently, the higher this maximum

⁹ In this benchmark exercise, we did not compare private investment as such but focused on participants' own contributions instead – partly to also include own contributions from public research institutions and partly to prevent discussions on how and from which sources recipients obtained the money themselves (to keep track of the origin – private or public – of the money).

percentage is, the lower is the own contribution of recipients needed and the lower is the impact in terms of own contribution per euro subsidy granted.

Table 3.1 Impact – participants’ own contribution per Euro public investment (Euro), by target group, 2012-2014*

	Total	Enterprises	SMEs	Large Enterprises	Knowledge Institutions	Other Entities
CDTI	3.3	3.3	3.0	3.5	-	-
Dasti - DSF	0.5	na	na	na	na	na
Dasti - HTF	0.9	na	na	na	na	na
Dasti - IC	2.2	na	na	na	na	na
EAS	na	na	na	na	na	na
EI	0.5**	-	-	-	-	-
FFG	0.9	1.5	0.6	2.6	0.4	0.8
MITA	0.2	0.2	0.2	-	0.0	-
RCN	1.8	na	na	na	na	na
RVO.nl	2.5	2.5	2.5	-	-	-
TA CR - ALFA	0.6	1.2	1.0	1.3	0.1	-
TA CR - OMEGA	0.3	0.5	0.4	1.6	0.3	-
Tekes	1.3	2.1	-	2.1	0.6	-

*the average over 2012-2014 is dependent on data availability and covers 2012 and 2013 for TA CR’s OMEGA programme; 2012 and 2014 for Dasti’s HTF programme; 2013 and 2014 for CDTI’s cooperative business R&D soft loans; 2013 for Dasti’s Innovation Consortia programme and 2014 for Enterprise Ireland’s Innovation Partnership Programme and RVO.nl’s R&D top sector cooperation projects

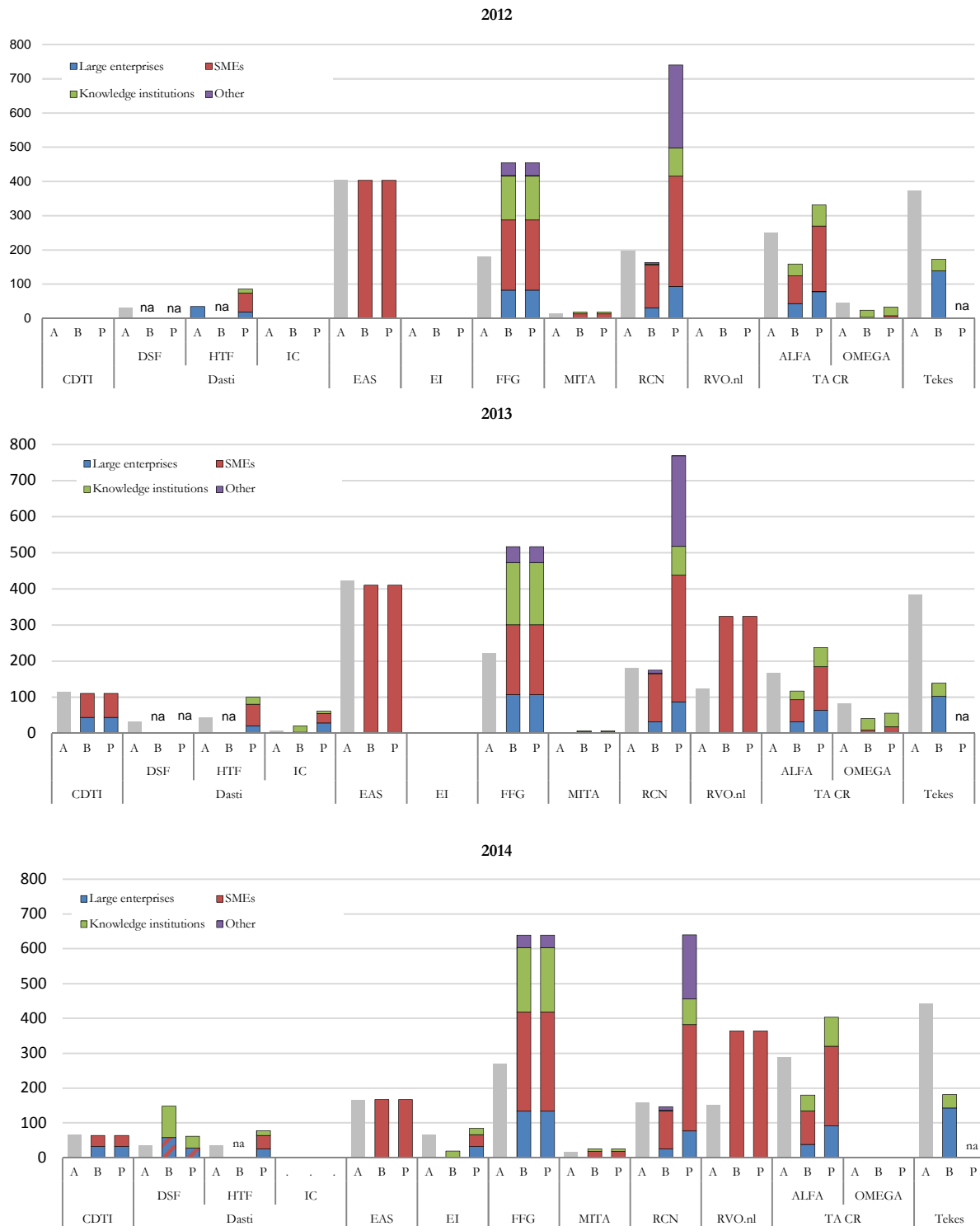
** in Enterprise Ireland’s Innovation Partnership Programme the budget is contracted to knowledge institutions while participants’ own contributions are brought in by business participants only (both SMEs and large enterprises)

3.3 Beneficiaries

In Figure 3.3 numbers of awarded grants, unique beneficiaries and unique project participants are depicted. Awarded grants refer to decisions on contracted budget, beneficiaries refer to organizations receiving the budget in order to initiate, coordinate and/or participate in collaborative R&D projects and participants refer to the organizations participating in the projects under consideration, irrespective of the question whether they have or have not received budget out of the R&D programme taken up in the benchmark. Both beneficiaries and participants are broken down in SMEs, large enterprises, knowledge institutes and other types of beneficiaries.

The large financial size of R&D projects of RCN’s and Tekes’ cooperative R&D projects coincides with a high number of awarded grants for these same instruments (around 200 for the programmes managed by RCN and over 400 for the programmes managed by Tekes). Although EAS voucher scheme programme is quite limited in budget size, the number of awards is high – over 400 awarded grants in 2012 and 2013 annually – a fact that undoubtedly can be connected to the small average grant size depicted in Figure 3.4. The ratio between number of grants, numbers of beneficiaries and numbers of participants reflects the design of the instruments. For instance, in Enterprise Estonia’s voucher scheme a relatively small subsidy is given to SMEs in order to cooperate with knowledge institutes and/or consultants in their innovation trajectories (in general this concerns bilateral cooperation). In the schemes managed by FFG and RVO.nl each award concerns one R&D project with several beneficiaries participating in the project (note that for these instruments the number of beneficiaries equals the number of participants). In the schemes managed by RCN and TA CR, the number of unique beneficiaries receiving the grant is only part of the population of all participants engaged in the R&D projects subsidized.

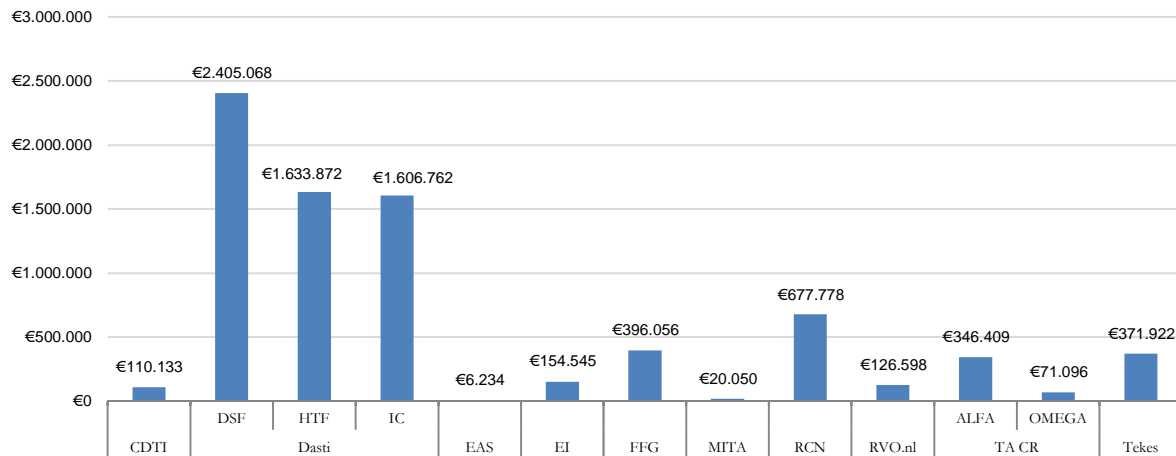
Figure 3.3 Number of awarded grants (A), unique beneficiaries (B)* and unique participants (P), 2012-2014



* For Dasti's DSF programme a distinction between SMEs and large enterprises is not available. The total number of enterprises as beneficiaries of and participants in this programme is represented by a red/blue striped bar in the chart.

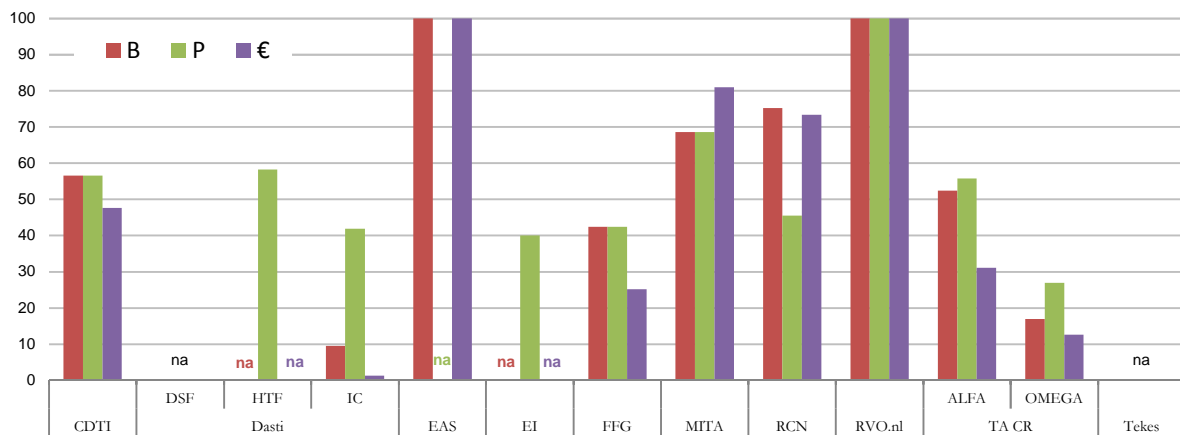
As can be concluded from Figure 3.4, the average grant size differs enormously between the programmes included in the benchmark. Cooperative R&D projects under the programmes managed by Dasti are quite large in financial size with each grant encompassing at least 1,6 million euro. Other programmes are far more modest in size of the public budget involved, ranging from a couple of hundred thousands euros to less than hundred thousand euros (TA CR's OMEGA programme and MITA's cooperative R&D programme) to even less than ten thousand euros (EAS innovation voucher scheme).

Figure 3.4 Average grant size (euro), 2012-2014*



*the average over 2012-2014 is dependent on data availability and covers 2013 and 2014 for TA CR's OMEGA programme and the cooperative R&D programmes managed by CDTI and RVO; 2013 for the IC programme managed by Dasti and 2014 for Enterprise Ireland's Innovation Partnership programme.

Figure 3.5 Small and medium sized enterprises: number of SME beneficiaries as a share in the total number of beneficiaries (B); participants (P) and contracted budget to SMEs, as a share in total contracted budget (€), 2012-2014*



*the average over 2012-2014 is dependent on data availability and covers 2013 and 2014 for TA CR's OMEGA programme and the cooperative R&D programmes managed by CDTI and RVO; 2013 for the IC programme managed by Dasti and 2014 for Enterprise Ireland's Innovation Partnership programme.

Figure 3.5 shows the share of SMEs in R&D cooperative grant programmes. This share is analysed in terms of beneficiaries (number of SMEs receiving grants in the total number of beneficiaries), in terms of participants (number of SMEs participating in cooperative R&D-project as a share in the total number of participants) and in terms of contracted budget (budget received by SMEs as a share in the total sum of budget contracted). EAS' Innovation Voucher scheme and the SME Top Sector R&D cooperation grant managed by RVO are exclusive focused on SMEs and hence score 100 percent. Other programmes score in majority within a range between 40 and 60 percent. The share of SMEs is a bit higher in RCN's and MITA's cooperative R&D programmes, with a share of SMEs in the total number of beneficiaries of 69 percent (MITA) and 75 percent (RCN). The number of SMEs as a share in the total number of beneficiaries, is relatively low for Dasti's Innovation Consortia programme (10 percent) and TA CR's OMEGA programme (17 percent). However, it must be noted that for both programmes, in terms of participants, the share of SMEs is remarkably higher (in TA CR's OMEGA programme this share is .

For most programmes, the share of SMEs in terms of beneficiaries is somewhat higher than the budget contracted for the benefit of SMEs. In TA CR's ALFA programme for instance, the share of SMEs in the total number of beneficiaries amounts to 52 percent, whereas the share of budget contracted to SMEs amounts to 31 percent. The exception is MITA's cooperative R&D programme. Here the share of SMEs in total number of beneficiaries amount to 69 percent, whereas the share of budget contracted to SMEs is even higher at 81 percent. The latter may be related to the fact that the programme is focused on commercialization activities, thus the role of research institutions in the projects is limited.

3.4 Organizing capacity

The objective of collaborative R&D grants is to support sustainable relationships between private and/or public partners. An important aspect of this so-called organizing capacity is the extent to which organizations are brought together to cooperate in joint R&D projects. Figure 3.6 depicts the number of relationships in the projects within the cooperative R&D programmes included in this benchmark. This indicator is based on the number of unique participants per project and the assumption that organizations which are working in the same project per definition are cooperating in this project and hence stand in a cooperation relationship with each other¹⁰. A distinction is made between company-company relations, company-knowledge institute relations and other relations (knowledge institutes mutually, companies and/or knowledge institutes with other organizations than knowledge institutes and/or companies)

For MITA's cooperative R&D programmes and TA CR's OMEGA programme the number of relations stays limited to a range of 4 to 18 (MITA) and 10 to 30 (OMEGA) connections a year. TA CR's ALFA programme and the cooperative R&D programmes managed by FFG build up a large number of relations a year (during 2012 to 2014 the annual number of relationships within R&D projects ranges between 1250 and 2320 relations annually. However, in terms of the number of relations within cooperative R&D projects RCN stands out with on average over 5000 connections per annum during 2012 to 2014. Main reason is that the RCN programmes taken up in the benchmark show – in comparison with the other agencies - a relatively uneven distribution of the number of participants per project (a small number of projects with a high number of participants generates a relatively high number of connections).

Table 3.2 summarizes a few indices on organizing capacity which put the number of participants and connections between them in relation to the number of grants awarded and the total budget contracted. In terms of the average number of participants, Dasti's IC programme and RCN's cooperative R&D programmes stand out with 9 and 4 participants involved in each grant decision. In terms of participants per euro budget contracted MITA's cooperative R&D scheme, with a fairly modest budget size below 1 million euros annually, attracts 73 participants per million euro public investment.

¹⁰ The number of C connections between N organizations in P projects is calculated through $C = \sum_p \frac{N(N-1)}{2}$

Figure 3.6 Cooperation relations, 2012-2014

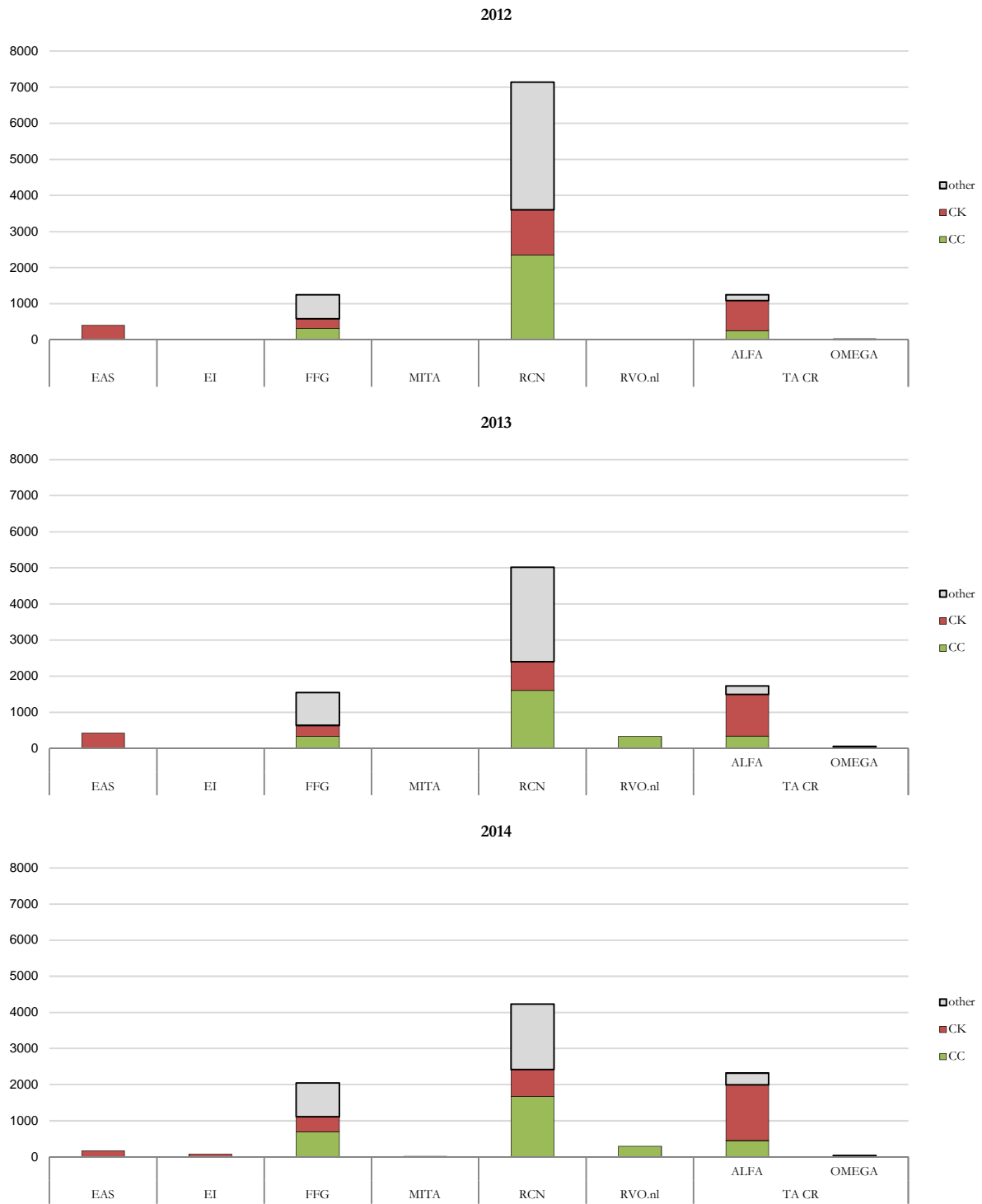


Table 3.2 Organizing capacity: participants per grant awarded and per euro budget contracted, 2012-2014*

		Participants per grant awarded	Participants per million euro budget contracted
CDTI		1.0	8.8
Dasti	DSF	0.6	0.3
	HTF	2.3	1.4
	IC	8.9	5.5
EAS		na	na
EI		1.3	8.3
FFG		2.4	6.0
MTA		1.5	72.7
RCN		4.0	5.9
RVO.nl		2.5	19.8
TA CR	ALFA	1.4	4.0
	OMEGA	0.7	9.8
TeKes		na	na

*the average over 2012-2014 is dependent on data availability and covers 2013 and 2014 for TA CR's OMEGA programme and the cooperative R&D programmes managed by CDTI and RVO; 2013 for the IC programme managed by Dasti and 2014 for Enterprise Ireland's Innovation Partnership programme.

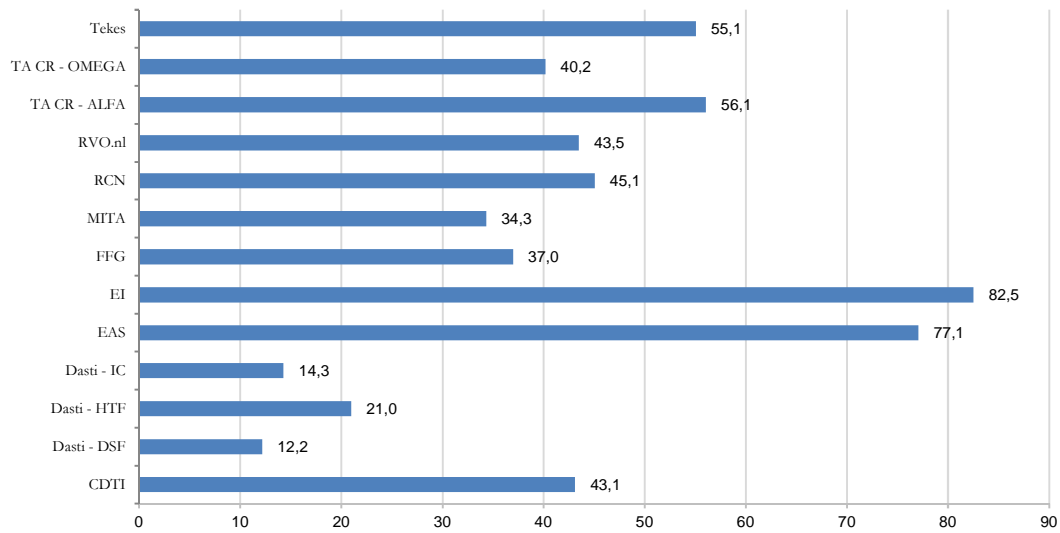
3.5 Application success rates

In Figure 3.7 information on the success rate of proposals is given. The success rate is defined as the number of successful proposals divided by the total number of both successful and unsuccessful proposals¹¹. A high rate might be an indication that proposers are well guided in writing their proposals and that criteria for acceptance are well defined, communicated and understood. A low success rate on the other hand might be an indication of the popularity of the programme in the target group and the possibility that programme management can be quite critical on the quality of the proposals. For a normative interpretation of success rates more insight in the design of the instrument, the size of the budget and the size and qualities of the target group must be taken into account.

In comparison with the other programmes, applications for the cooperative R&D programmes managed by Dasti have a relatively low chance to be accepted to receive a grant, with success rates for DSF, HTF and IC of 12, 21 and 14 percent respectively. On the other hand, EAS' Innovation voucher scheme and the Innovation Partnership scheme managed by EI have relatively high success factors of 83 and 77 percent.

¹¹ For most agencies, the number of successful proposals equals the number of proposals that received funding. However, in TA CR Alfa and Omega programmes, the success rate is defined on the basis of the number of proposals that successfully through the project selection's evaluation process. Because of budget restrictions and a possibility that applicants do not sign the agreement of support the number of awarded grants in TA CR's ALFA and Omega programme is significantly lower than the number of successful proposals.

Figure 3.7 Success rates: number of successful proposals as a share in the total number of (both successful and unsuccessful) proposals (%), 2012-2014



*the average over 2012-2014 is dependent on data availability and covers 2013 and 2014 for TA CR's OMEGA programme and the cooperative R&D programmes managed by CDTI and RVO; 2013 for the IC programme managed by Dasti and 2014 for Enterprise Ireland's Innovation Partnership programme.

Chapter 4 Innovation vouchers

4.1 Introduction

Innovation vouchers generally provide SMEs with a cheque representing a small sum of money to be used by SMEs to buy innovation related services, typically from a research institute, university and/or consultant. This benchmark focuses on eight innovation voucher schemes managed by seven innovation agencies¹². See Box 4.1 for an overview. The usual disclaimer applies to be cautious in interpretation of the results because of differences in scope (sectors, types of R&D), budget, criteria, target groups and design of the instruments. Although the indicators and definitions are the same across agencies and instruments (unless stated otherwise), differences in the context and design lead to a comparison between apples and oranges.

In this chapter the comparison is made between the programmes' size in terms of budget (in terms of the sum of values of both issued and reimbursed vouchers) and the number of applications, issued and reimbursed vouchers as well as the mutual ratio to each other.

Box 4.1 Innovation vouchers included in the benchmark

- Dasti's Innovation Voucher encourages SMEs to collaborate with universities, research and technology institutes and education institutions. The maximum amount is € 13,500 not exceeding 40 percent of the innovation project costs. Dasti's innovation voucher scheme has been in existence since 2008 and taken up in the Innovation Booster scheme in 2014.
- The Innovation Voucher initiative by Enterprise Ireland was developed to build links between Ireland's public knowledge providers (i.e. higher education institutes, public research bodies) and small businesses. Innovation Vouchers worth €5,000 are available to assist a company or companies to explore a business opportunity or problem with a registered knowledge provider.
- The voucher schemes managed by FFG concern Innovationscheck and Innovationscheck plus. Both programmes support the first know-how exchange between SMEs and researchers in which innovative ideas are either generated, evaluated or prototypically developed. The external project costs are limited to € 5,000 with a funding rate of 100 percent (Innovationscheck) or € 12,500 with a funding rate of 80 percent (Innovationscheck plus). FFG's Innovation Voucher scheme is also eligible for cooperation between large enterprises and other types of organizations, rather than solely focused at SMEs.
- Boosting cooperation between SMEs and science is also the aim of MITA's Innovation Voucher scheme in which supported activities are research, development (including design) and feasibility studies. A company may receive a voucher for up to € 6,000.
- PARP makes a distinction between small and big vouchers, the former granting vouchers of up to PLN 15,000 (~ € 3,500) and the latter granting up to PLN 50,000 (€ 12,000). The vouchers are only applied for after a first initial contact by the SME with the Scientific Institution providing the service.
- At RVO.nl, the voucher scheme is a part of the SME Top Sector scheme and covers (in 2013) 50 percent of the costs of the knowledge institution providing innovation services to the SME (40 percent in 2014).
- SIEA's Innovation Voucher scheme make a distinction for SMEs and large companies. For SMEs the costs are funded 100 percent with a maximum of € 5,000. For large enterprises costs are only funded for 45 percent with a maximum of € 10,000.

¹² Enterprise Estonia's voucher scheme has been taken up in the category of R&D collaboration project since it does not actually relate to a voucher in the sense of a cheque that has to be reimbursed in order to convert it to conventional money, but relates to (a relatively small) budget which is granted through a relatively straightforward, simpler and easy application procedure.

4.2 Financial size

Budgets in 2014 range from 4,5 million euro (Enterprise Ireland) to 235,000 euro (SIEA). In 2013 the budget of Dasti's voucher scheme stands out with a budget of 5,5 million euros. The budget is almost exclusively focused at SMEs to which the vouchers are issued. In general, the reimbursement is also taken care of by the SMEs themselves. The exception to this practice concerns FFG's innovation vouchers which are reimbursed by the knowledge institutes after acceptance and delivery of the service. Although the value of issued and reimbursed vouchers in Figure 4.1 are for most agencies quite in line with each other in the years between 2012 and 2014, it is important to remark differences must be interpreted with caution. Vouchers that are reimbursed in a given year do not necessarily relate to exactly the same vouchers that are issued in the same year since there is also a possibility that the voucher that are reimbursed in a given year were issued the previous year. A comparison between reimbursed vouchers issued in a given year (but not necessarily reimbursed in that same year) and issued vouchers in the same year forms a good comparison to relate reimbursed and issued vouchers with each other because they are based on the same set (cohort) of vouchers (see next section).

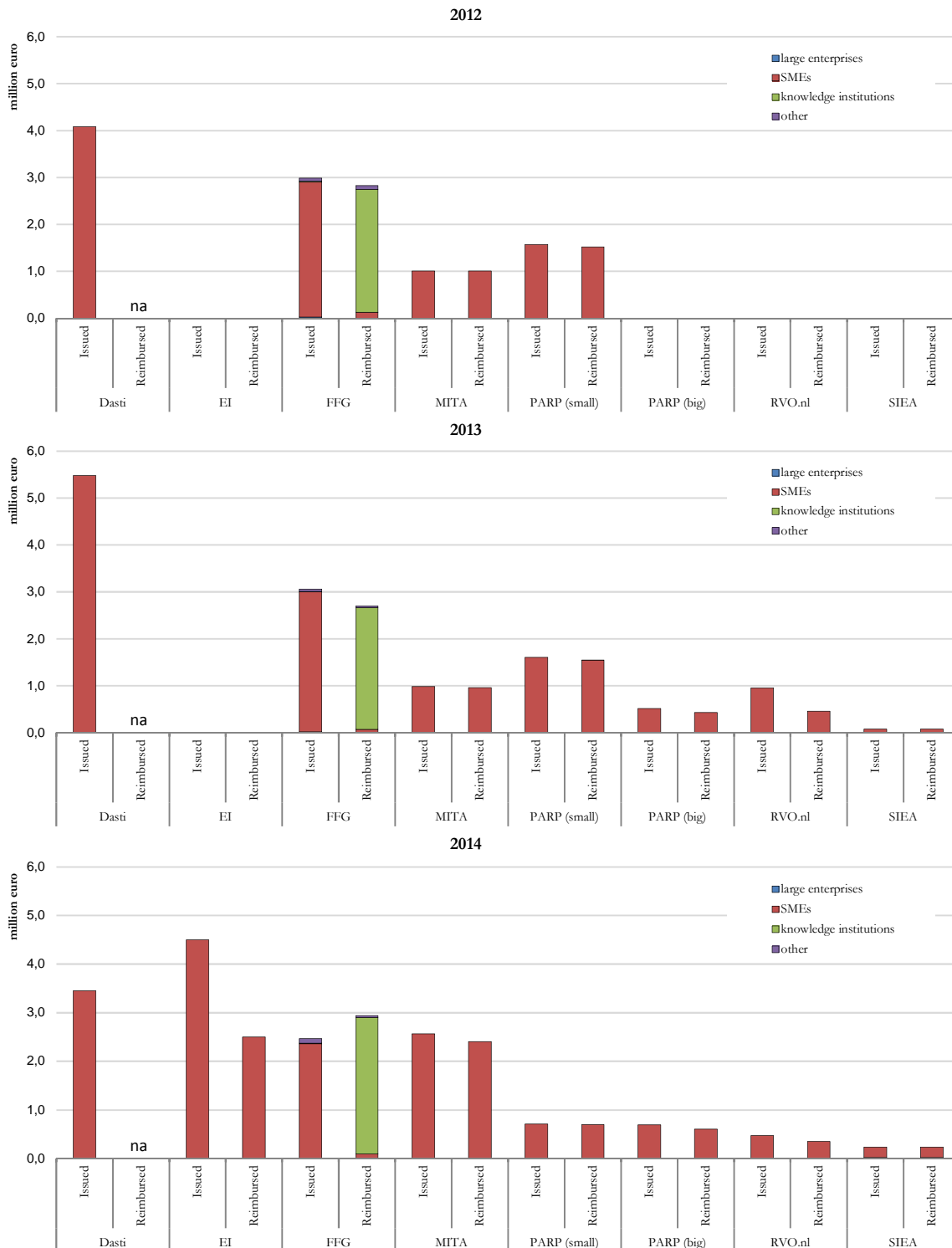
The value of the vouchers issued are, without exception, quite modest in size (Table 4.1). In two voucher schemes the average voucher value exceeds the amount of ten thousand euros (Dasti's voucher scheme and PARP's big voucher scheme). For the other voucher schemes, the average value per voucher lies around five thousand euros. The small voucher scheme managed by PARP and RVO.nl's voucher scheme for SME top sector have the smallest values with amounts below four thousand euros.

Table 4.1 Average size of vouchers (euro), 2012-2014

	2012	2013	2014	2012-2014
Dasti	13 353	13 399	13 386	13 381
EI			4 978	4 978
FFG	5 349	5 186	5 969	5 451
MITA	5 454	5 545	5 620	5 566
PARP - big		11 245	10 184	10 612
PARP - small	3723	3 718	3 536	3 685
RVO.nl		3 750	3 780	3 760
SIEA		3 500	5 222	4 674

* the average is based on three years except for Enterprise Ireland's voucher scheme (2012), PARP's programme for big vouchers and the schemes of RVO.nl and SIEA (all 2013 and 2014)

Figure 4.1 Innovation vouchers' budgets: sum of values for issued and reimbursed vouchers

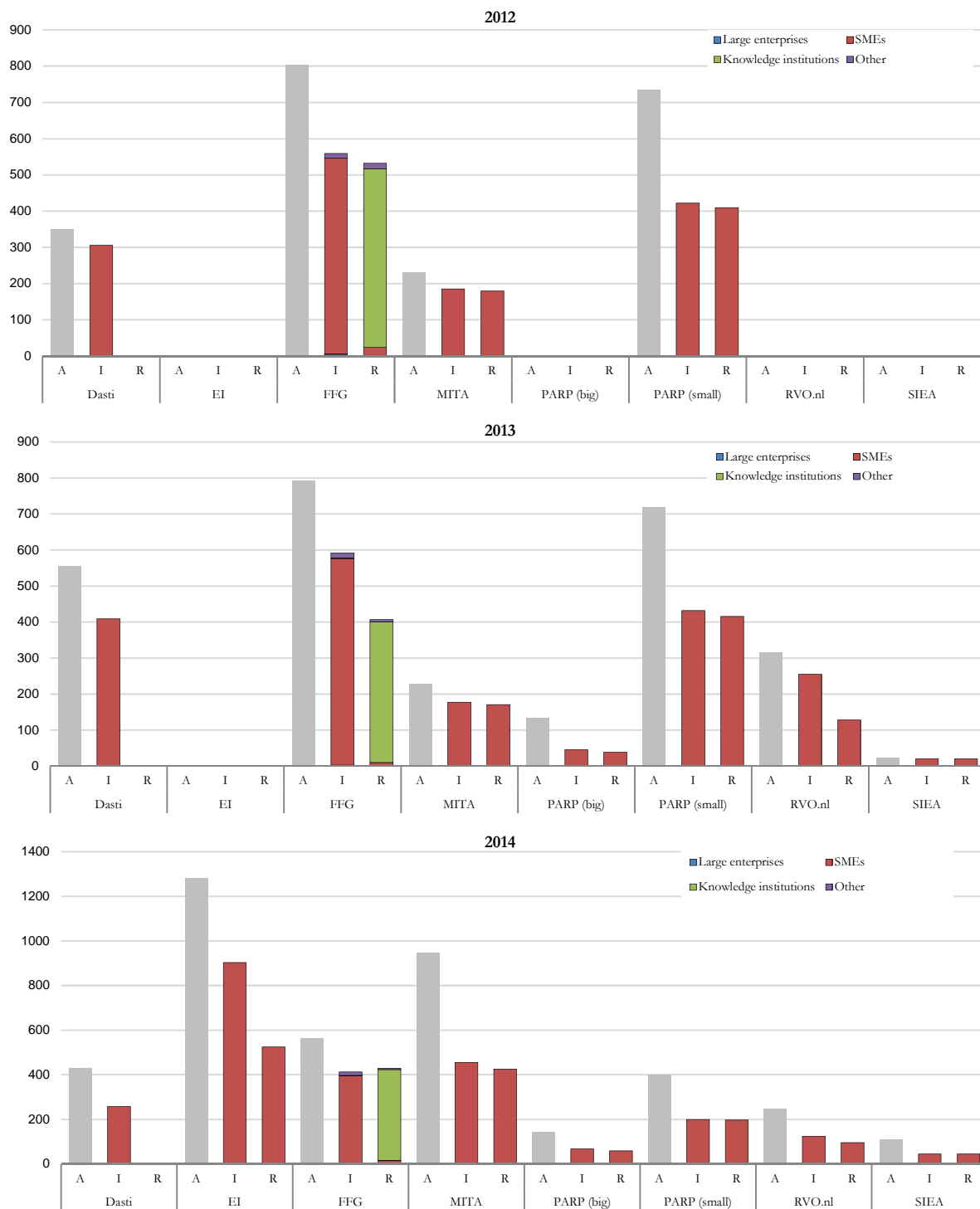


4.3 Applications, vouchers issued and vouchers reimbursed

Figure 4.2 depicts the number of voucher application, issued vouchers and reimbursed vouchers. All numbers relate to the same set (cohort) of vouchers. The vouchers (and voucher applications) are attributed to the year on the basis of the date on which the vouchers (successful voucher applications) are issued. By definition, issued vouchers are a subset of voucher applications (only the successful application are issued for the benefit of the applicants) and the reimbursed vouchers are a subset of the issued vouchers (only a part of all vouchers issued are reimbursed). Figure 4.3 relates issued vouchers to voucher applications (the number of issued vouchers as a share in total voucher applications) and reimbursed vouchers to vouchers issued (the number of reimbursed vouchers as a share in the total number of vouchers issued). In terms of numbers the voucher schemes of Enterprise Ireland, FFG, MITA and the small vouchers managed by PARP are relatively large in size.

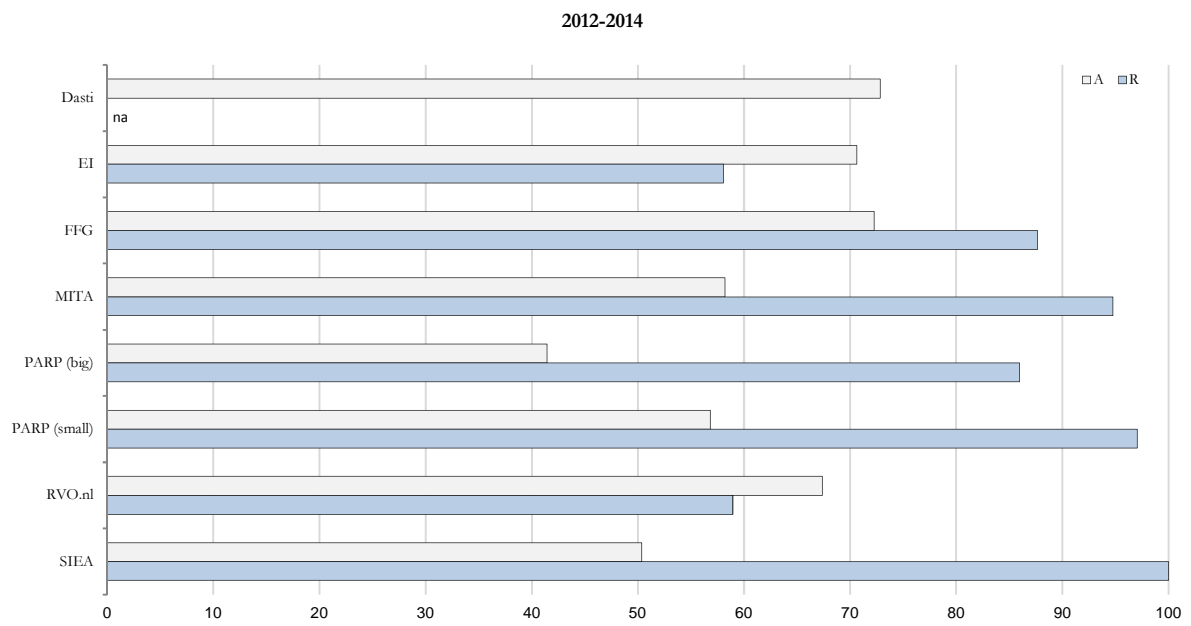
The application success rate differs from 42 percent (PARP big voucher scheme) to 73 percent (Dasti's voucher scheme). Like Dasti's voucher scheme, the voucher schemes managed by Enterprise Ireland, FFG and RVO.nl also show relatively high success rates of voucher applications. Reimbursement rates are quite high for the voucher schemes managed by SIEA and MITA and the small voucher scheme managed PARP. For SIEA the average reimbursement rate during the period 2012 to 2014 even amounts to a full hundred percent meaning that without exception all issued vouchers are reimbursed. For MITA and PARP's small voucher reimbursement rates are 95 and 97 percent respectively. In comparison with the other voucher schemes taken up in the benchmark exercise the voucher schemes managed by RVO.nl and Enterprise Ireland both show relatively low values of under 60 percent. For FFG, the reimbursement rate varies considerably over the years (ranging from 69 percent in 2013 to 104 percent in 2014). This is due to the fact that for FFG the reimbursed vouchers in a given year are taken up, instead of the reimbursed vouchers of the vouchers *issued* in a given year.

Figure 4.2 Voucher applications (A), issued vouchers (I) and issued vouchers reimbursed* (R), 2012-2014



* reimbursed vouchers are attributed to the year the voucher was issued (and thus not necessarily the year the voucher was reimbursed)

Figure 4.3 Application success rate (A) and reimbursement rate (R), 2012-2014



Chapter 5 Competence centres

5.1 Introduction

Competence Centres are collaborative entities established and led by industry and resourced by highly-qualified researchers associated with research institutions who are empowered to undertake market focused strategic research for the benefit of industry. The objective of Competence Centre initiatives is to achieve competitive advantage by accessing the innovative capacity of the research community. Main difference with R&D collaborative projects is that Competence Centres initiatives are not about financing individual R&D projects but are centered on (often thematic) programmes with synergies created through coherence in a bundle of projects.

In this report six Competence Centre Initiatives of five agencies are benchmarked (see Box 5.1)¹³. Since the programme design and scope of the programmes differs from agency to agency, we must be very cautious in interpreting the results of the benchmark.

Box 5.1 Competence Centre programmes included in the benchmark

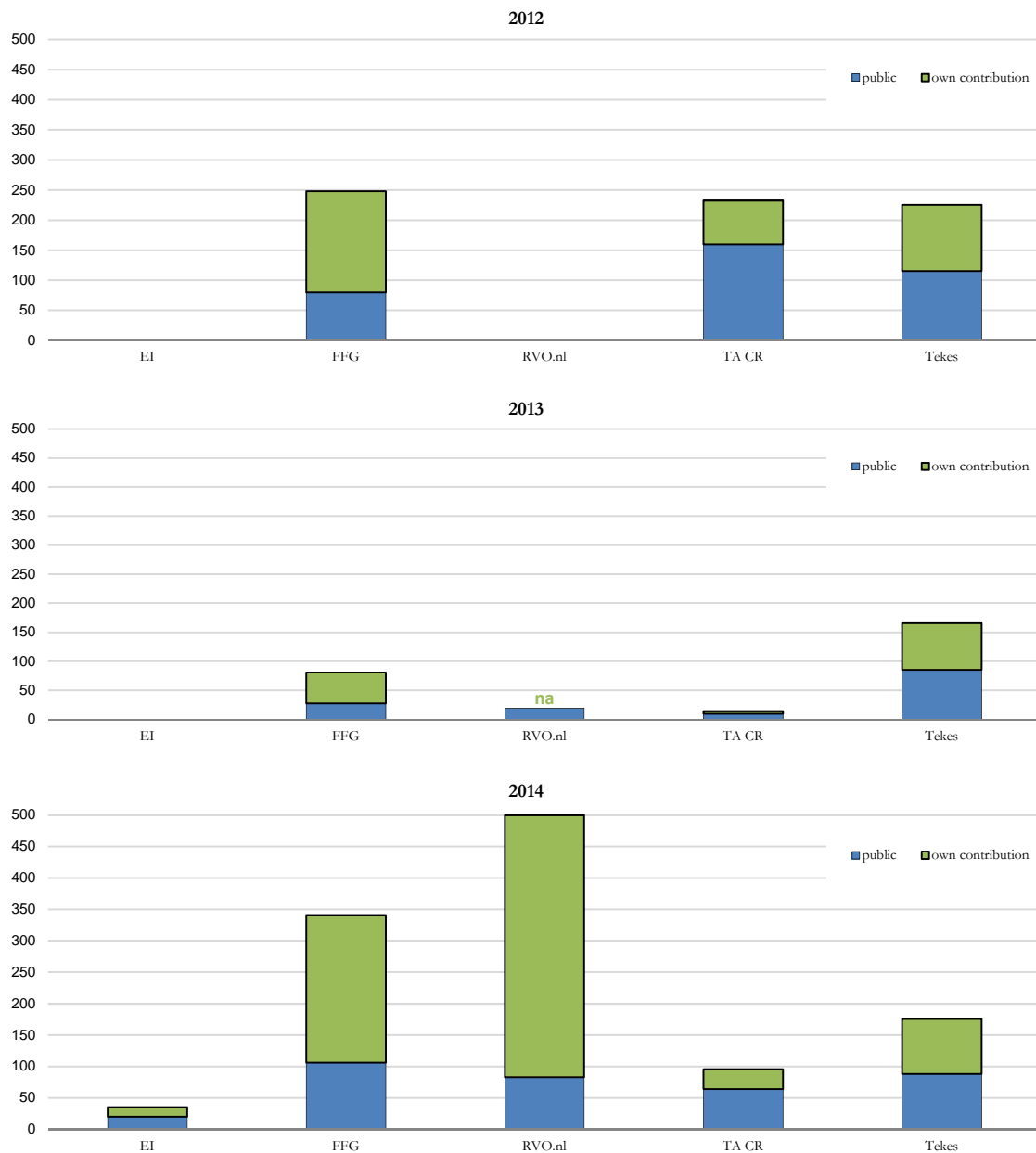
- Enterprise Ireland's Competence Centre programmes are focused on the interaction between companies and researchers in industry-led R&D. As a general rough guide, a successful centre operates with public funding in the order of 1 million euros a year over a five year period.
- The Competence Centre initiatives supported by FFG concern Comet and Laura Bassi Centres of Expertise. COMET was launched in 2006 and bundles top-level research competences in physical centres by supporting long-term research cooperation between science and industry. Some 1 500 researchers from science and industry work on jointly defined research programmes at more than 50 centers and networks. Budgets range from 12 million a year for K2 Centres (international outstanding research), 5 million euro a year for K1 Centres (high potential research) and 1 million euro a year for K Projects (specifically oriented at newcomers). Funding amounts to maximum 55 percent of eligible costs. In the Laura Bassi Centers of Expertise, excellent women head research centres at the interface between science and economy. Seven centres conduct research in the field of IT, medicine and life sciences. Public funding amounts to 320 000 euros at maximum 60 percent of eligible costs.
- RVO.nl Top Consortia for Knowledge and Innovation (TKI) focus on industry-science collaboration in the fields of the nine top sectors. Collaboration projects are framed within a strategic Innovation Contract which sets out the priorities for each top sector. Project proposals are processed and evaluated by the centers and are publicly supported through a financial top-up of 25 percent of total project costs. Private contributions amount to at least 40 percent of all turnover.
- TACR's Competence Centre run from 2012 to 2019 and support the establishment and operation of centres for research development and innovation in national priorities of targeted research in advanced fields. The approved budget amounts to 6,3 billion CZK and the maximum level of support amounts to 70 percent of total eligible costs.
- Tekes SHOKs programme supports the creation of Strategic Centres For Science Technology and Innovation. The public funding of the SHOKs through a dedicated Tekes' scheme has terminated in 2015. In the centres, companies and research units work in close cooperation, carrying out research that has been jointly defined in the strategic research agenda of each Centre. Their main goal is to thoroughly renew industry clusters and to create radical innovations. Centres (SHOK in Finnish) develop and apply new methods for cooperation, co-creation and interaction. International cooperation also plays a key role in the operation of the Strategic Centres. Testing and piloting environments and ecosystems constitute an essential part of the Strategic Centres' operations.

¹³ Enterprise Estonia's Competence Centre programme is also taken up in the benchmark exercise. However, it is not taken up in the report as the data on EAS' Competence Centre programme predominantly focus on 2008 and 2009, whereas the data on the other programmes taken up in this report focus on 2008 and 2009.

5.2 Financial size

Figure 5.1 depicts the financial size of competence centre schemes. The Top Consortia of Knowledge and Innovation, the competence centre scheme managed by RVO.nl stands out with 500 million income in 2014. The competence centre schemes managed by FFG, TA CR and Tekes are quite comparable in size and fall within a range of 226 (Tekes) and 341 (FFG) million euros.

Figure 5.1 Financial size of Competence Centre programmes (public contribution and participants' own contribution in million euros), 2012-2014



It must be noted that the exact amounts each year are highly dependent on the funding rhythm and timing in each competence centre scheme. For instance, the funding of both FFG and TA CR concerns multiple years. Hence, the financial impulse differs extremely between the years (for instance, for TA CR the financial size differs from 226 million in 2012 to only 14 million in 2013). For RVO.nl's competence centre scheme 2013 was a start-up year and only in 2014, public and private investments got going.

Figure 5.2 Impact – participants' own contribution per Euro public investment (Euro), 2012-2014

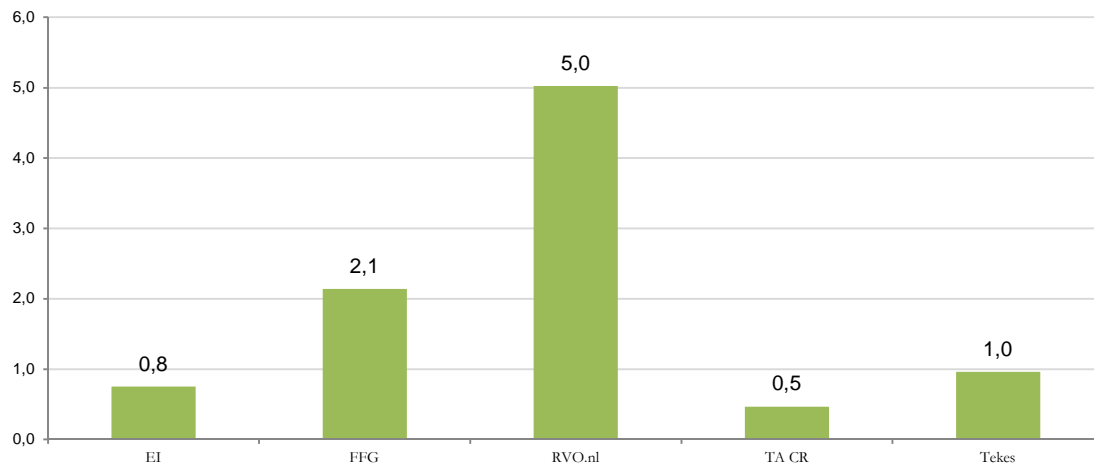


Figure 5.2, which depicts participants' own contributions in competence centres per euro public investment, makes clear that the large financial size of the competence centres in the Netherlands can be fully explained by the relative high private contributions in Dutch competence centres. For each euro invested by government the participants themselves invest five euros. With a factor over two the ratio between participants' own contributions and public investment is also quite high for the competence centre schemes managed by FFG.

Table 5.1 places the public contribution in the context of the number of competence centres supported. Here, the SHOK competence centres managed by Tekes clearly stand out with 14 to 19 million euros per centre supported. In comparison with the other agencies has a clear focus with only six centres eligible for support. The number of competences in the schemes managed by the other agencies varies between 15 and 33 in 2014 and hence, the financial support per centre is remarkably lower (in 2014 1,3 to 4,2 million euros)

Table 5.1 Average public contribution per competence centre supported (million euros), 2012-2014

	2012	2013	2014
EI			1,3
FFG	11,4	1,4	4,2
RVO.nl		1,0	4,4
TA CR	7,6	0,4	1,9
Tekes	19,3	14,2	14,7

5.3 Organizing capacity

Competence centres bring participants together from both industry and science to cooperate with each other on R&D projects in a coherent programme. Figures 5.3 and 5.4 summarize the number of participants and the number of cooperative connections between the participants involved in R&D projects¹⁴. The number of participants differs to large extent between the competence programmes managed by different agencies. The competence centre programmes managed by FFG and RVO.nl bring together a relatively large number of participants of around 800 for both programmes in 2014. For the competence centres managed by Enterprise Ireland and Tekes this number fluctuates between 400 and 500 and for TA CR's competence centre programme the number of participants in R&D projects is quite limited with just over 100 participants involved.

There is a considerable amount of fluctuation of the number of participants over the years within the same competence centre programme. The number of participants is quite stable over the years in the SHOK centres managed by Tekes (during 2012 to 2014 in the range of 359 to 469 participants). For FFG numbers fluctuate considerably from 546 in 2012, down to 248 in 2013 and upwards to 821 participants in 2014. In the competence centres managed by TA CR the number of participants drops considerably from 2012 to 2013 (from 136 down to 23) to rise again in 2014 to 109 participants. The same fluctuation can be seen in the number of relationships (cooperation connection in R&D projects executed within the competence centres). Especially in the competence centres managed by FFG this fluctuation is extreme (from around 30,000 in 2012 to around 3,600 in 2013 and back to roughly 30,000 in 2014).

Table 5.2 summarizes the position of SMEs in the competence centre programmes. In the competence centres managed by Enterprise Ireland the share of SMEs in the total number of participants is remarkably high, 58 percent. The competence centres managed by FFG show relatively modest shares of SMEs in the total number of participants with shares ranging from 28 to 35 percent. The Top Consortia for Knowledge and Innovation (RVO.nl) the SHOKs (Tekes) and the competence centres managed by TA CR show shares of SMEs ranging between forty and fifty percent.

Table 5.2 Small and Medium-sized Enterprises as participants in competence centres, as a share in the total number of participants (absolute figures between brackets), 2012-2014

	2012	2013	2014	2012-2014
EI			58.3 (250)	58.3 (250)
FFG	28.4 (155)	34.7 (86)	32.9 (270)	31.6 (511)
RVO.nl		41.2 (181)	48.7 (380)	46.0 (561)
TA CR	42.6 (58)	44.4 (68)	45.7 (112)	44.6 (238)
Tekes	49.1 (221)	42.6 (153)	53.7 (252)	49.0 (626)

In Figure 5.5 some relative figures on participants and cooperative connections are presented. In the figure, numbers of participants are related to public budgets. It is remarkable that with a limited budget, the competence centres managed by Enterprise Ireland connect a relatively high number of participants with each other. Per million euros public money invested 21 (unique) participants are brought together in R&D projects. This number is high in comparison with the other agencies.

¹⁴ The indicator on the connections is based on the number of participants per project and the assumption that organizations which are working in the same project per definition are cooperating in this project and hence stand in a cooperation relationship with each other. The number of C connections between N organizations in P projects is calculated through $C = \sum_P \frac{N(N-1)}{2}$

Figure 5.3 Participants in competence centres, 2012-2014

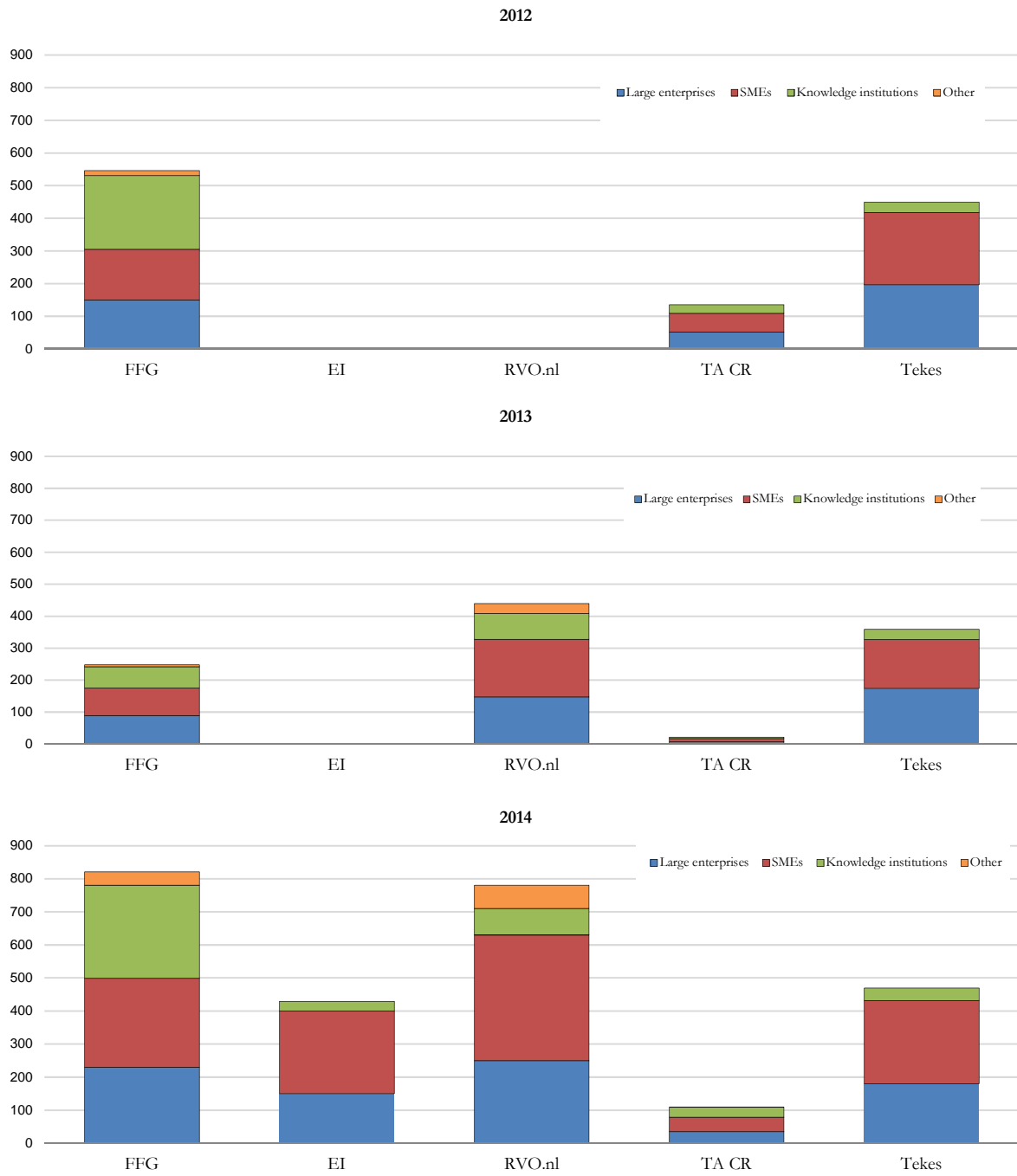


Figure 5.4 Cooperation relations in competence centres, 2012-2014



Figure 5.5 Organizing capacity: average number of unique participants per euro budget contracted, 2012-2014

