

Impact Assessment of EUREKA Network Projects and Cluster Projects

Main findings and recommendations

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EUREKA IMPACT ASSESSMENT – KEY RESULTS

This Report of the **Impact Assessment of EUREKA Network Projects and Clusters Projects** contains the main findings of the analysis including recommendations. The assessment was carried out by a consortium led by Prognos AG and its research partners, Joanneum Research and Professor Cincera (Université Libre de Bruxelles). All participants in projects which received the EUREKA label in the period of 2001-2015, either as a Network or as a Cluster Project, were studied. The empirical work was based on a European wide survey, an econometric analysis, and in-depth case studies.

Key facts:

- **Annual turnover of firms** in EUREKA R&D projects develops **significantly better** than turnover of non-participants: one year after the end of projects, project participants showed an additional annual turnover growth of 15% (Network Projects) and 13% (Cluster Projects) compared to non-participating firms.
- **Development of employment** is also **positive**: one year after the end of projects, project participants showed an additional annual employment growth of 4% (Network Projects) and 7% (Cluster Projects) compared to non-participating firms. In terms of firms' size, differences are observed: large companies (firms with more than 250 employees) experienced the highest performances one year after project completion.
- Participating firms expect a **strengthened economic positioning** through the EUREKA project, with the entering of **new markets** (69% of survey respondents), improved **market shares** (68%), and **increased exports** (67%) being the most relevant aspects.
- **International co-operations** (more than 70%) and **new business opportunities** (more than 60%) are the most relevant motivation for participation in EUREKA according to survey respondents.
- **High degree of flexibility** of EUREKA, building upon a strong **bottom-up approach**, is an essential asset from the perspective of many participating firms.

A: BACKGROUND

EUREKA member countries mobilised an estimated EUR 11.2 billion in total project costs for Network and Cluster Projects over the 2001-2015 period.

Between 2001 and 2015, the total budget of the funded **Network Projects**¹ reached EUR 2.4 billion, of which EUR 1 billion was financed by project participants. More than 1,300 projects were supported in this period. The 14 **EUREKA Clusters**, on the other hand, implemented 477 projects with a total project cost of EUR 8.8 billion.

Concerning the EUREKA Clusters, the assessment analysed the impacts of **four selected cases**, namely: CELTIC-PLUS, EUROGIA/EUROGIA+, ITEA1/ITEA2 and MEDEA+/CATRENE. The selection followed the hypothesis that the exploitation of research results does not directly begin with the end of the R&D project, but needs additional time for production preparation, the development of market strategies, etc. The economic effects of R&D projects may be observable after a short time-period, but especially within a period of up to six years. Hence, the analysis concentrated on Clusters which had their major research activities and the majority of project completions between the years of 2007-2011.

¹ Network Projects were known as Individual Projects until 2015.

Table 1: Amount of R&D funding under EUREKA 2001-2015 (Network Projects, Clusters)

	Total project costs (EUR million)	Number of projects
Network projects	2,367	1,334
Clusters and projects corresponding to the analysed period		
ACQUEAU ²	39	16
CELTIC / CELTIC-PLUS	745	107
EURIMUS / EURIMUS II	121	16
EURIPIDES	206	35
EUROGIA / EUROGIA+	99	24
ITEA 1 / ITEA 2	2,041	142
MEDEA+ / CATRENE	5,429	118
MF.IND	32	3
PIDEA	140	16
Total NP & CLS	11,219	1,811

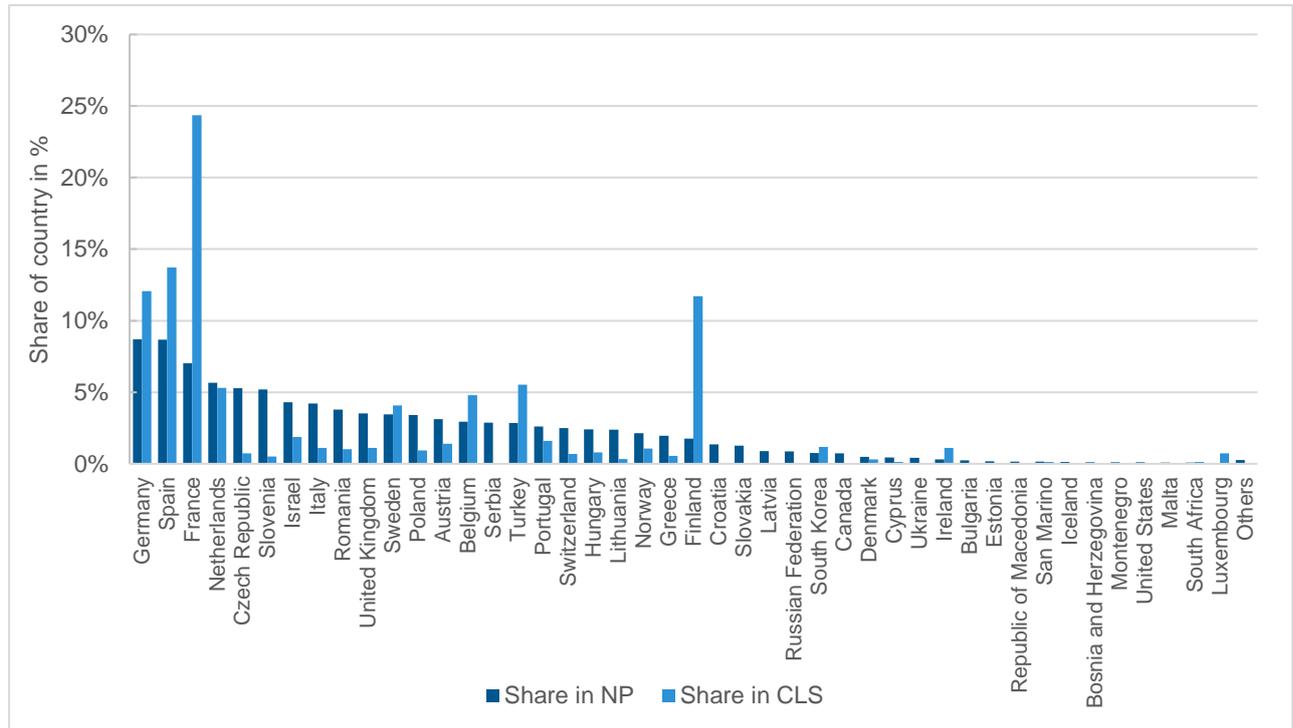
Source: Prognos/Joanneum Research/ULB (2017), based on data provided by EUREKA secretariat.

Note 1: The table includes all finished Network and Cluster projects that started and ended between 2001 and 2015. The clusters EURIPIDES², EUROGIA2020, ITEA3, and PIDEA+ are not included, as the corresponding projects did not satisfy the timing criteria as explained above.

Figure 1 displays the **distribution of funded and labelled firms in EUREKA Network and Cluster Projects** based on the country of origin. Regarding Network Projects, Germany and Spain are the two main EUREKA member countries, with a share of 8.5% overall, or more than 900 participating firms. France has a high share of Network Projects (7%) but an even stronger position in Cluster Projects (>24%). Further member countries with more than 5% of participants in Network Projects include the Netherlands, the Czech Republic, and Slovenia. Regarding Cluster Projects, the origin countries of participating firms are much more concentrated: 60% of participants are based in four countries (France, Spain, Germany, and Finland); 70% based in six countries (the mentioned four plus Turkey, and the Netherlands). Research activities of firms in these countries seem to be well aware of the Clusters' research agendas and they are closely linked with their main research topics.

² The figures for the ACQUEAU cluster are retrieved from <http://www.eurekanetwork.org/sites/default/files/eureka-general-presentation.pdf>

Figure 1: Distribution of firms in EUREKA Network and Cluster Projects based on the country of origin (project duration within the period between 2001 and 2019/2020)*

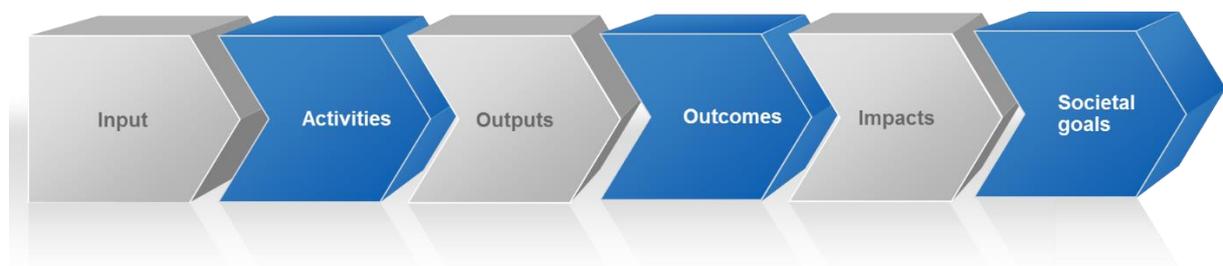


Source: Prognos/Joanneum Research/ULB (2017), based on data provided by EUREKA secretariat. Note: * for Cluster Projects, the data includes several projects that started before 2001.

EUREKA aims to stimulate outstanding research results with clear market relevance based on international collaborative R&D.

The selection and promotion of R&D projects in EUREKA is intended to strengthen Europe as a location for business and investment. The research projects shall have a close link to the market and create opportunities of exploitation as a precondition for the competitiveness of European industries. Different effects are expected in the short- (output), medium- (outcome) and long-term (impact). The focus is not only on the rapid exploitation of research results. An overall improved behaviour in managing and performing international R&D collaboration should lead to a variety of benefits to participating organisations. In particular, the most intangible changes are a company’s improved strategy and competitiveness. The following figure outlines the basics of this intervention logic.

Figure 2: Generalised model of EUREKA’s intervention logic for Network Projects and Clusters



Source: Prognos/Joanneum Research/ULB (2017), based on EUREKA Working Group for Impact Assessment.

Since EUREKA’s creation in 1985, its key objectives have been to assure the technological independence of Europe in the key domains of the future, to encourage co-operation between

European science and industry and to support firms in innovation and unification of European markets. The overall idea of EUREKA aimed for European independence, competitiveness and integration as well as the development of future technologies or sectors.

There are **key differences between EUREKA and other European R&D funding programmes**, although both programmes share some comparable histories, for example, launching the first programmes in the mid-eighties fostering European collaboration on R&D topics. The table below summarises the background and main characteristics of EUREKA and the EU RTD Framework Programmes.

Table 2. Comparison of EUREKA – EU RTD Framework Programmes

	EUREKA	EU RTD Framework Programmes (EU FP)
Background	EUREKA was established (in 1985) to assure technological independence of Europe in the key domains of the future, to encourage co-operation between European science and industry and to support firms in innovation and unification of European markets. EUREKA was aimed at fostering European independence, competitiveness and integration as well as developing future technologies and sectors. EUREKA pays specific attention to the firm side initiative (esp. SMEs).	The EU RTD Framework Programme (EU FP) was established in 1984 aiming at mobilisation and cumulating of resources for research conducted on a vast scale (particularly in a monetary and geographical sense) but also unification of European science and research systems (ERA) and European regulations and standards. Thus, EU FPs are dedicated to tasks which can't be solved by single member states.
Characteristics	EUREKA combines European (multinational) commitment or evaluation and decentralized (national) funding. This provides a flexible frame for co-operation with all EUREKA partner countries (beyond EU): Aside from individual (network) projects, EUREKA defined larger strategic initiatives focusing on major high-technology domains which are coordinated by leading business involving SMEs, public research and organisation. Since "JESSI" started in 1987, major research initiatives were started by EUREKA. Since 2000 clusters became the second pillar of EUREKA (reaching 70 % of budget in some years). EUROSTARS is the third pillar of EUREKA, bridging EU RTD FP funding for SMEs since 2008. Since 2010 EUREKA becomes more and more open to non-European countries, with the inclusion of three Associates and opening up the Globalstars calls with third countries.	The EU FPs are clearly defined by specific programmes and calls any proposals/tenders must scope with. The EU FPs support co-operation with non-EU-member countries via INCO (international co-operation). The evolution of EU FPs (1 to 8) showed significance of the integration of a European Research Area, the development of lead markets (including regulatory frame) and grand societal challenges. With FP 6 EU-internationalisation and "Third Country" cooperation has been extended. With FP8 (H2020) multilateral (coordination and policy) initiatives significantly gained in importance.

Source: Prognos/Joanneum Research/ULB (2017).

The parallel development of EUREKA and EU FPs significantly enriched the landscape of collaborative applied research and innovation in Europe throughout the last three decades.

B: MAIN FINDINGS

Annual turnover of participating firms develops significantly better than turnover of the control group over time.

R&D in EUREKA projects is intended to be "near-to-the-market". Firms should be able to exploit the R&D results quickly. The econometric assessment has shown clear evidence for the success of the near-to-market approach, the **average annual turnover** growth is in general positive and significant for participants of both Network and Clusters Projects in comparison to the control group. The regression coefficients are relatively higher, meaning that participants achieved much better results in terms of annual sales. For example, one year after

the end of projects (i.e. in t+1) Network and Cluster project participants showed an additional annual turnover growth of 15.1% and 13.2%, respectively, compared to non-participating firms.

Besides an overall positive impact of project participation on turnover, firms participating in EUREKA also show higher **employment growth**, which is significant compared to the non-participating firms – a finding that was also reported by the evaluation of Eurostars, which showed that the employment growth rate of small and medium-sized firms receiving R&D funding from Eurostars was nearly twice as high as that of the non-funded firms. Further effects on the economic performance of EUREKA participants in Network and Cluster Projects were collected by a survey. In addition to the increase in turnover (73%), EUREKA participants expect benefits in the **entering of new markets** (69%; local or foreign), an improvement of **market shares** (68%), or an increase of **exports** (67%) by exploiting their R&D results.

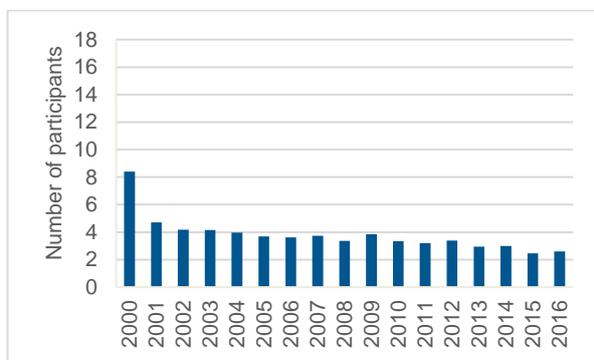
Smaller R&D-consortia and shorter project durations raise the probability of successful commercialisation, especially for Network Projects.

In recent years, the **number of consortium partners** per project and the average **duration of EUREKA projects have decreased**. As the analysis found, **projects lasting between one and three years** show the **highest positive and significant impacts** in general both for Network and Cluster Projects. This means that firms involved in shorter projects can commercialise their R&D results faster and more effectively compared to firms participating in projects of longer duration.

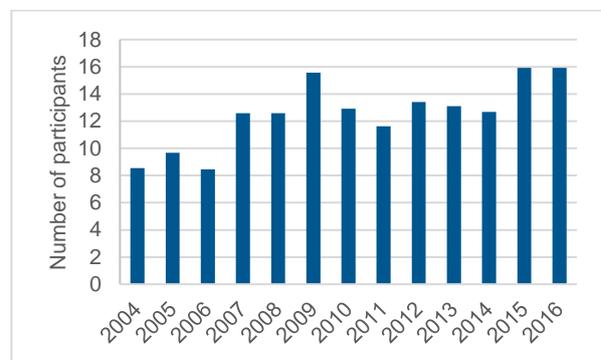
Figure 3: Number of Consortium Partners and Project Duration in EUREKA Network and Cluster Projects

Average Number of Consortium Partners

Network Projects, 2000-2016

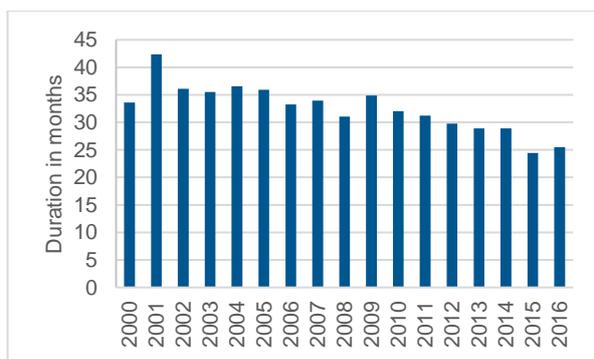


Cluster Projects, 2004-2016

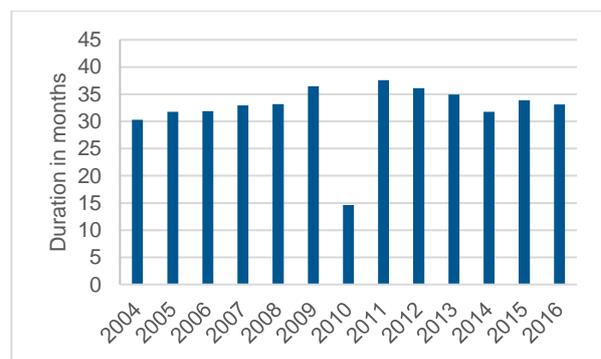


Average Duration in Months

Network Projects, 2000-2016



Cluster Projects, 2004-2016



Source: Prognos/Joanneum Research/ULB (2017), based on data provided by EUREKA secretariat.

This trend is strongly driven by the **Network Projects** which show a drop of consortium partners from around eight participants in 2000 to an average of around four participants in 2009 and finally to less than three participants on average in 2016. Similarly, the project duration of Network Projects steadily decreased from its height in 2001 (over 40 months) to an average of two years in 2015 and 2016.

In the case of **Cluster Projects**, the number of consortium partners and project duration is higher, and yet, the overall trend described above is also not as clear. While Cluster Projects in the early years of the scheme ranged at around eight to ten consortium partners (2004 to 2006), the average number of consortium partners increased to 12-14 between 2010 and 2014 to finally reach its current level of an average of 16 consortium partners (2015 and 2016). The average project duration is also considerably higher in the Cluster Projects ranging at an average of around 33 months in 2016; though a shorter duration compared to the highest levels in 2011 (38 months).

Given that **EUREKA projects are meant to be “near-to-the-market”**, project duration and consortia-size emerged as an important area to investigate more closely. By further econometric analysis, the impact of project duration on turnover of the participating firms could be assessed, differentiating between projects lasting from one year to five years. The average duration in Network Projects decreased from 3,5 years in 2001 to 2 years for projects starting in 2016.

Overall, the changes in size and duration of the R&D consortia could be driven by the motivation for lower cooperation cost and shorter time-to-market. Both factors are important in an innovation environment that is increasingly driven by the need for higher R&D productivity and characterised by shorter life cycles of innovations and rapidly changing markets.

The internationalisation of R&D activities is the driving motivation for EUREKA participants, in particular in Cluster Projects.

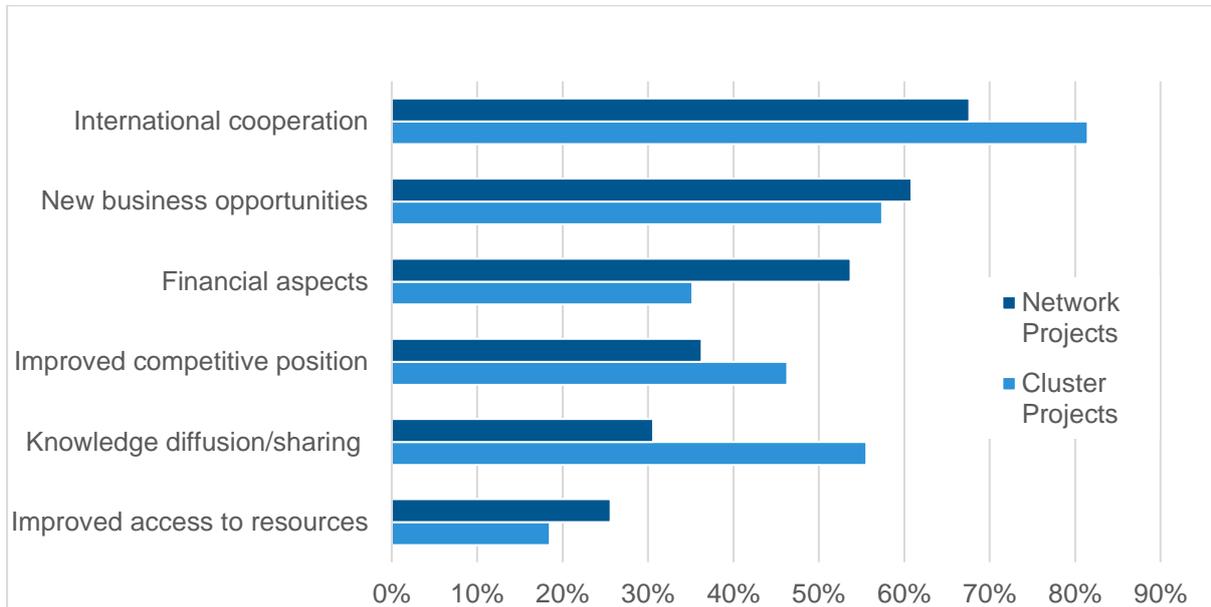
The **main motives** for participation in EUREKA projects are **opening up international co-operations** (nearly 70% of survey answers from participants in Network Projects and more than 80% from Clusters) and **new business opportunities** (around 60% of the whole sample). The scope for the identification of international research partners has significantly improved with the expansion of EUREKA into 45 member countries. In addition, as found in earlier research, for **large firms**, a key motivation to participate in Cluster Projects is the **involvement in activities of standardisation and standard-setting** – an important notion when it comes to the interpretation of direct impacts of EUREKA projects on large firms. Furthermore, about half of the respondents name financial aspects and the possibility of sharing risks or costs as the third and fourth main motivators. Financial aspects are particularly relevant to companies in Network Projects.

Entry in international research network		
ICT company		
300 employees		Portugal
<p>“Our participation in the EUREKA project increased our prestige and enlarged our cooperation network. The collaborative R&D widened our scope of competencies.</p> <p>Participation in an EUREKA project is an attractive way for companies to access key international groups, leading scientists and potential customers.”</p>		

In addition, as found in earlier research, for **large firms**, a key motivation to participate in Cluster Projects is the involvement in activities **for standardisation and standard-setting** –

an important notion when it comes to the interpretation of direct impacts of EUREKA projects on large firms.³ This indicates a more strategic view of R&D, which targets longer-term effects.

Figure 4: Selected Motives for participating in EUREKA Network and Cluster Projects (% of respondents)



Source: Prognos/Joanneum Research/ULB (2017), based on treatment group survey (n=72-190 for NP; n=10-44 for CLS).

The **challenge to find suitable partners** (approx. 43% of survey respondents), **administrative burden** (approx. 40%) and **bureaucracy** associated with national as well as international funding (approx. 38%) were the primary barriers to participate in EUREKA projects.

Benefits through the interplay of different innovation cultures



NP



7



6



LE, SME, Universities

An international network project included partners from six countries, representing large, small and medium enterprises from different sectors (IT-service provider, energy equipment manufacturer, ICT company) and several universities. The project intended to develop a new business model enabling the control over production and retailing chains from anywhere in the world by means of wireless devices, thereby anticipating the trends of Industry 4.0 and the Internet of Things.

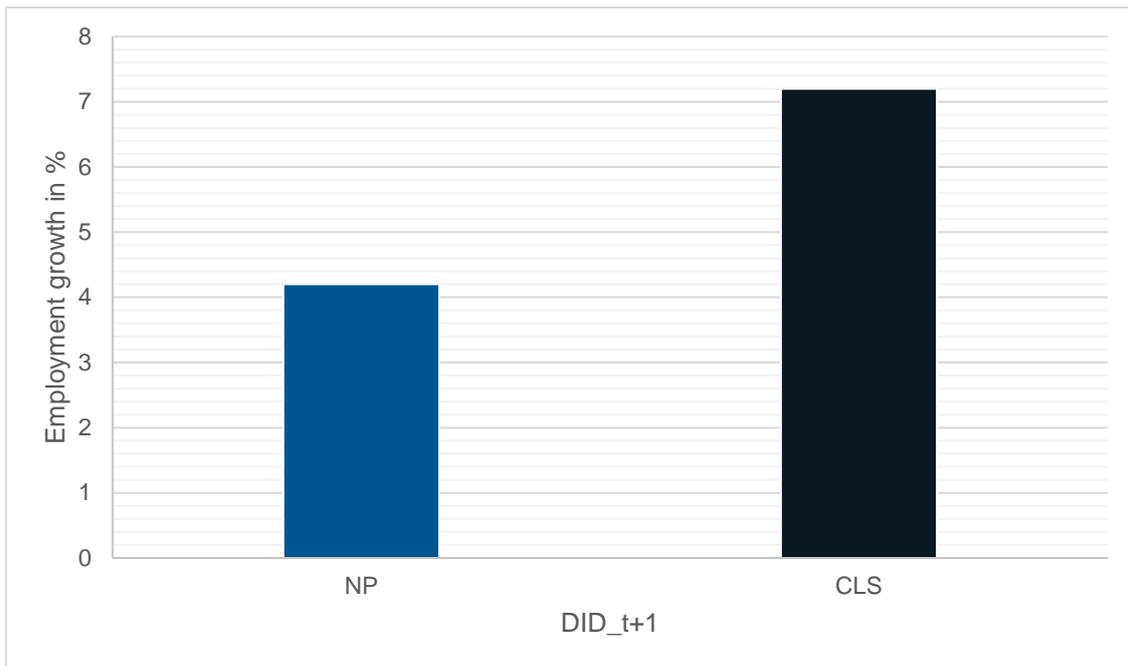
As a result of the project, internal production processes were improved (large manufacturer), a new commercial service was developed (IT-service provider) and international cooperation beyond Europe (with the Korean partner) was initiated. Further benefits mentioned by company representatives were both economic, such as the motivational effect of international cooperation, or social, such as the discovery of different attitudes and new approaches.

³ See Georghiou (2007): What lies beneath: Avoiding the risk of under-evaluation.

Development of employment is also positive, but shows a greater variance among firm sizes that deserves a further detailed analysis.

The econometric analysis also found an **overall positive impact of project participation on employment**, which is globally positive for both Network Projects and Cluster Projects. One year after project completion, the impact on employment for Network Projects is around 4%, while for Cluster Projects an impact of employment of more than 7% was found, as the figure below shows.

Figure 5: Overall impact on employment over time: Network (NP) and Cluster Projects (CLS)



Source: Prognos/Joanneum Research/ULB (2017), based on econometric analysis.

In comparison to the analysis of the turnover effects, we have to note that the employment figures are ambivalent. This is the result both for different company sizes as well as for analyzing the development over time. The results and trends are less clear. This can be caused by the economic crisis, e.g. in the European ICT sector the crisis led to a sharp drop in employment between the years 2008 and 2010. Overall the sectors of telecommunications, ICT manufacturing industries, and communication equipment showed negative trends in the development of employment over the period from 2006 to 2013.⁴ The overall positive development of employment of EUREKA participants is in any case to be seen as a positive indicator of the effectiveness of collaborative research, although both - positive and negative - effects can be observed in individual company size classes and during the different periods of observation.

Further indicators underline a substantial improvement of economic performance among EUREKA firms.

Besides an overall positive impact of project participation on turnover and employment, which is significant compared to the non-participating firms, further effects on the economic performance of EUREKA participants were collected by the survey.

⁴European Commission (ed.): Europe's Digital Progress Report 2016 - The EU ICT sector and its R&D performance.

Expansion of companies' research profiles



CLS



6



4



LE, SME, Universities

In the following cluster-project, a large French telecommunications company (> 10,000 employees) took the lead in a consortium consisting of six partners from four different countries, researching „self-organizing networks“. The technology became very important in their market area though they were lacking specific knowledge in the field. However, the cluster project supported the enterprise in developing a strong expertise within the new technological area, making it a key component of the company's strategy. Further, the project generated not only a new industrial tool, which was commercialized afterwards, but led also to an increase in research staff.

Asked what effects were already achieved and/or are expected through the EUREKA project, the increase of turnover (73.2%) followed by the three market-driven effects, namely the entering of new (local or foreign) markets (68.8%), improved (local or foreign) market shares (67.6%), and increased exports (66.7%) were most relevant between 2014-2016. A second group of effects, which were also achieved in a considerable number of cases, includes an increase of research staff (64.3%) and general staff (64.3%), and the overall improvement of the competitive positioning of the firm due to the EUREKA project (61.7%).

Table 3: Economic achievements of Network Projects (expected & achieved combined)

	Network Projects				Cluster Projects			
	Achievements of projects starting in...			N	Achievements of projects starting in...			N
	Up to 2008 (in %)	2009-2012 (in %)	2013-2016 (in %)		Up to 2008 (in %)	2009-2012 (in %)	2013-2016 (in %)	
Economic performance								
Increased turnover	63.0	69.1	80.0	216	62.5	73.3	76.0	48
Increased number of research staff	56.9	59.4	65.3	211	62.5	60.0	73.1	49
Increased number of staff	54.3	56.9	67.1	211	62.5	64.3	69.2	48
Increased exports	60.3	61.5	69.9	206	37.5	58.3	66.7	44
Market Development								
Entering new local/foreign markets	58.2	66.7	72.0	205	62.5	66.7	75.0	44
Improved local/foreign market share	58.2	67.2	68.5	204	37.5	50.0	73.9	43
Improved competitive position	65.1	69.8	63.5	138	66.7	72.7	77.8	35
Other Economic Achievements								
Enhanced productivity	38.1	50.0	49.0	133	57.1	30.0	50.0	35
Savings in resources (e.g. time, costs)	27.9	39.0	38.0	134	33.3	30.0	47.1	33
External capital raised	24.6	37.7	34.3	184	25.0	25.0	21.7	43
Creation of a spin-off company	23.8	29.4	25.0	182	37.5	25.0	12.5	44
Changes in the organisation								
Change of commercialisation strategy	34.4	47.4	45.2	194	0.0	25.0	45.8	43
Change of Innovation strategy	31.7	43.9	54.0	132	16.7	10.0	31.3	32
Improved management, quality of work	35.7	43.9	46.0	133	42.9	22.2	50.0	32

Source: Prognos/Joanneum Research/ULB (2017) based on treatment group survey.

The bottom-up approach of EUREKA is highly welcomed by researching companies and gives leeway to quite different research topics.

The higher degree of flexibility of EUREKA compared to other funding programmes, building upon the philosophy of a **strong bottom-up approach**, is an important asset from the perspective of many participating firms. Interviewees frequently argued that in comparison with other European or international R&D programmes, EUREKA is seen as more flexible regarding consortium size and R&D topics. This flexibility is often associated with the bottom-up and open-call system and the resulting “room-to-manoeuvre in the system” when it comes to the definition of deadlines or the thematic focus. As a result, **projects in EUREKA can also start quicker** compared to other European R&D funding programmes, which is perceived as another important advantage specifically in industries where technologies are changing rapidly.

Funding in accordance with the company's agenda	
Textile company	
Medium-sized	Czech Republic
<p>“The bottom-up approach of EUREKA is a big advantage, especially for industrial partners and innovative companies. In other programmes, you either work with call topics, which are very complicated or specified so broadly that it becomes difficult to focus on something specific and innovative.”</p>	

All in all, the flexibility and bottom-up approach of EUREKA strongly underlines its position as a near-to-the-market R&D funding programme, which makes it **particularly attractive for industrial partners and innovative SMEs**, as it allows them to decide about the specific topics and exact focus of their projects.

C: RECOMMENDATIONS

The synchronisation and the acceleration of funding decisions are still priority No. 1 on the agenda for improvement.

A specific area of improvement in EUREKA is an often-difficult **and long-lasting synchronisation of funding decisions**. The case study analysis confirms the difficulties of synchronising funding from different countries, in particular concerning the agreement and alignment of different partners and countries (time frames, budget allocations, funding rules etc.). Interviewees reported that different funding criteria of EUREKA member countries not only increase uncertainty, but that potential participants may be excluded due to these; a clear shortcoming compared to other R&D programmes in Europe. Finally, it was frequently mentioned that the **time lag** and the time variation of obtaining the funding among consortium partners from different countries can lead to significant uncertainties and run the risk of “preventing many projects”. In view of the accelerating innovation cycles, a great need for action is obvious. Finally, a fast time to contract will be an important element of such an approach.

The harmonisation of funding opportunities is still a challenge, which can lead to delays in starting projects.

The further harmonisation of funding opportunities and funding rules is also still a major topic on the agenda of improvement. Almost one out of four survey respondents (24,5%) saw a lack of harmonisation between funding rules and funding bodies. This rating is even higher in the case of Cluster Projects (approx. 40%; Network Projects approx. 20%). They typically rely on a larger consortium size (over 30% of projects had 6-10 partner from 2004-2016) from a higher number of countries, on average 3-4.

The current reform discussions on the new EUREKA 2020 strategic roadmap, in particular the even stronger positioning of EUREKA as a unique international platform to support joint calls for international R&D&I projects and the focus on lean governance, are pointing into the right direction. Similar findings and recommendations were reported in the Eurostars evaluation, which revealed a need for improvement in harmonising funding rules and synchronising national processes.⁵

Recognize the diversity of project types and create more opportunities for “speed-boats” in the Clusters.

The analysis shows different models of exploitation. On the one hand, **short-running projects** (up to 2 years duration) which have a close link to the market. Here we can observe more direct impacts on turnover. This type of R&D project seems to be driven by current market and customer needs. On the other hand, EUREKA also enables **projects of 2 and more years duration** which may be closer linked to future market needs or even shaping them. Here we have to factor in a greater uncertainty regarding market and technological developments and the researching firms typically need additional steps of activities for the commercialisation.

The case studies underlined the picture that there are different project types with different commercialization perspectives. While the larger and long-term oriented consortia aim at a further development of the technological state of the art, which will yield economic results in the (near) future, the smaller and short-term oriented projects are more effective with regard to current markets. To strengthen the benefits of **all EUREKA project types**, especially in the Clusters, a new project type (“speed-boats”) could be explored and tested in the future.

Added value: quick implementation of R&D results possible

ICT company

130 employees

Spain

“The added value of EUREKA is that it can lead to very ‘near-to-market’ results. Especially for our project this has been an important element.”

Capture the exploitation perspective of projects at an early stage and support the validation of its plausibility.

The case studies show that considerable efforts are still to be made until the market entry after completion of the research project. Consequently, the early progress check could be used to validate the market perspective at an early stage and could be strengthened to increase expected benefits of projects in the future (e.g. by strengthening and systematically supporting the (joint) commercialisation efforts). This could be linked to the current discussions on the EUREKA 2.0 approach for Network Projects in the EUREKA 2020 strategic roadmap, which advocates an easy set-up of ad-hoc calls between several countries with support services coming from the EUREKA Secretariat.

Commercialization of research results frequently requires access to additional instruments of innovation financing.

Not all follow-up activities of the EUREKA projects may be financed by the network and its instruments. Investment in additional production facilities needs complementary opportunities for investment financing or the mobilization of venture capital. The cooperation of EUREKA with the European Structural Funds (ESIF, particularly ERDF and ESF) provides a relevant area of future improvement. The so-called “[Stairway to Excellence](#)” (S2E) idea of the European Commission advocates to close the innovation gap and to promote excellence in Europe.

⁵ Makarow M. et al. (2014) Final Evaluation of the Eurostars Joint Programme, Expert Group report on behalf of the European Commission, Brussels.



Currently companies from the 13 Member States (EU13) who joined the European Union in 2004 and subsequent years can participate. In this way, the research infrastructures shall be improved to facilitate capacity building (up-stream). At the same time, commercialization or downstream activities for specific target groups, especially SMEs, shall be supported by different instruments of financing (e.g., ERDF innovation support for SMEs aiming to finance piloting plants etc.).

Examine whether the breadth of innovation activities can be covered by EUREKA funding.

In view of the numerous effects that can be observed at the process level of firms participating in EUREKA, the question remains whether both the impact chain (see also recommendations below) and the underlying innovation concept of EUREKA is currently defined sufficiently. In addition to the process dimension, other non-technical and social components of the innovation process (i.e., social innovations, non-technical innovations) and also the development of new business models (i.e. business model innovations) must also be considered. In this case, it should be examined whether sufficient room for maneuver is available in order to stimulate and promote corresponding research and innovation activities.

EUREKA impact assessment requires an ambitious but demanding mix of research methodologies, and above all high-quality data.

The impact assessment performed for the EUREKA Network and Cluster Projects relied on a **comprehensive methodological approach** consisting of a counterfactual survey, an econometric assessment using a Difference-in-Difference design, and complementary case studies. Currently, however, the ESE database with its information on applicants, projects, project progress and impact, needs to be improved – a finding also reported by the Eurostars evaluation in 2014. If such a comprehensive analysis of impact assessments is to be applied in the future, **data collection, information content and data quality** (e.g. up-to-date e-mail address material, complete lists of funded and non-funded project participants etc.) needs to be further improved throughout the full funding cycle (including non-successful participants). Further, **data collection from EUREKA Clusters** should be improved and harmonised, with ITEA providing a good practice. Current plans in the strategic roadmap regarding comprehensive evaluation and impact assessment point in the right direction and should be given high priority.

EUREKA is characterised by a variety of intervention logics which differ across the four major instruments. For the future, an elaboration of instrument-specific “theories of change” could improve both impact assessments and instrument development.

At the moment, all EUREKA instruments follow a **general intervention logic** which outlines how EUREKA stimulates outstanding research results with clear market relevance based on international collaborative R&D. Supported research projects must have a close link to the market and create opportunities of exploitation as a precondition for the competitiveness of European industries. For Network Projects and Clusters, a number of different effects are expected in the short- (output), medium- (outcome) and long-term (impact).

A direction for the future elaboration of EUREKA’s intervention could lie in the development of instrument-specific “theories of change”. A theory of change is defined as ‘a way to describe the set of assumptions that explain both the mini-steps that lead to the long-term goal and the connections between policy or programme activities and outcomes that occur at each step of

the way'.⁶ Besides the typical elements of an intervention logic (i.e., inputs, outputs, outcomes, impacts), a theory of changes explicitly includes indirect and wider effects resulting from the supported projects (e.g., in the case of Cluster Projects, there are likely to be numerous indirect/wider effects of large firm involvement on the participating SMEs).⁷ Moreover, a theory of changes pays a lot of attention to external factors, i.e. factors and circumstances that are not part of the causal chain of the EUREKA support in a strict sense, yet have a significant influence on achieving the intended changes. These can be: (1) influencing factors, i.e., factors that are components of the 'causal package' of project implementation, in addition to the EUREKA support (e.g. R&D tax incentives by the central government), (2) key assumptions, i.e., factors taken for granted by policy-makers, which enable the theory to materialise (such the availability of the required and relevant collaboration partners for a project), and (3) other trends or events, such as general market trends. Furthermore, a theory of changes includes also so-called alternative explanations which encompass alternative theories to those articulated in the Theory of Change, which can also be plausible explanations of the observed changes. All in all, such an expansion of the EUREKA intervention logic into a theory of change framework per instrument could be an important next step for the instrument development and even more so as a baseline for future impact assessments.

⁶ DG REGIO (2013): 'EVALSED Sourcebook: Method and Techniques', Regional and Urban policies, Brussels.

⁷ Kramer J. und Kaszap A. (2017): Theory-based impact evaluation in practice – Key findings and policy learnings from the ex-post evaluation on Cohesion Policy support to large enterprises, in: European Structural and Investment Funds Journal (EStIF) & KPMG/Prognos (2016): Ex-Post Evaluation of Cohesion Policy Support to Large Enterprises (Workpackage 4), on behalf of DG REGIO.

Overview of the methodological approach:

A novel impact assessment design was chosen to integrate different tools measuring the impacts of EUREKA's R&D funding in Network and Cluster Projects.

Acknowledging the complexity of interventions and impact mechanisms, we recognised specific limitations in prior EUREKA impact assessments, calling for a more comprehensive and holistic methodological approach. Building upon an intensive analysis of previous studies of EUREKA projects, an impact assessment design was established composed of a counterfactual survey, an econometric analysis and a complementary case study analysis, all inherently linked for triangulation.

The chosen **survey approach** made it possible to consider a larger number of indicators and opened additional possibilities for the evaluation of effects. The motivation of both the treatment group and the control group to participate in the survey were a prerequisite for gaining these additional insights. All in all, with around 3,000 firms more EUREKA firms were addressed by this survey than in other EUREKA impact studies before. Over 370 firms answered the survey (response rate of evaluable questionnaires of around 19%). For the **econometric analysis**, a two-stage approach was implemented using firstly the survey data of treated (that means participants in EUREKA projects) and non-treated companies (researching firms without participation) and secondly, as a complementary approach, an econometric analysis based on enriched data of the economic development of participating and non-participating companies. The identification of participants of EUREKA projects and matching companies in the AMADEUS database facilitated corresponding analyses. Finally, using an **in-depth comparative case study approach**, building on a multiple-respondent design with several respondents per EUREKA project from different firms (total number of interviews: 50) and a within- as well as across-case comparison based on the intervention logic of EUREKA, we analysed success factors and barriers of using research results within different types of enterprises, explored intangible effects of the supported projects and identified suggestions for future improvement.

By the means of **data triangulation**, results from these three streams of investigation provided new insights on the impacts of EUREKA-funded projects, specifically with the necessary differentiations according to size or innovation type of participating firms. Thus, in all research streams, the impact analysis considered different dates for the observation of effects: one year, three and six years after finishing the funded R&D projects. Despite the extensive triangulation, capturing the impact of EUREKA projects on large enterprises remained challenging, because of many exogeneous factors that are influencing their development besides a single R&D project. Nevertheless, the case studies provided some valuable insights alongside of findings from the literature review.