GUIDE

Successful collaborations between companies and research institutes

LUXINNOVATION
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Successful collaborations between companies and research institutes

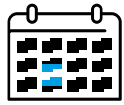
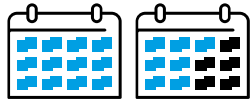
Is your company interested in becoming a leader in your market or moving into new markets through **innovation capability building**?

Is your company looking to gain access to high level research and innovation expertise as well as state-of-the-art research facilities?

If yes, then consider a collaboration with a public **Luxembourg-based research institute**.

Managing an R&D (research & development) process with an external partner is not necessarily difficult, but it does require mutual understanding and attention to detail. There is a greater chance of collaborative success if both parties understand their interests, roles and responsibilities upfront. Collaboration can be rewarding for both the company and the research institute. This guide has been developed to offer you insight on what it takes to start a collaboration between a company (commercial entity) and a research institute.

How to engage with a research institute

COMPANY OBJECTIVE	FORM OF COOPERATION	ACCESS TO RESULTS IN...
 A company wants to access intellectual property (IP) that already exists or is being created	 Licensing agreement with the owner of the IP (exceptional IP assignment)	 A few weeks
 A company wants to commission research at a research institute	 Contract research	 A few months
THE FOCUS OF THIS GUIDE IS COLLABORATIVE RESEARCH		
 A company wants to collaborate with a research institute on a new research programme	 Collaborative research	 A few months to a few years
 A company wants to train research staff	 PhD or postdoc training	 A few years

There are different options depending on the interest and needs of the two parties involved — the company and the research institute.

This guide focuses on collaborative research. In this case, the company and the research institute both commit resources in order to reach a common objective. The terms and conditions of the collaboration (costs, sharing of risks and results, access to — and rules for — the allocation of intellectual property, etc.) must be concluded prior to the start of the project.

Other forms of cooperation between a company and a research institute include:

Contract research/provision of research services: In this case, the company pays for the research services carried out by the research institute. This type of arrangement is relevant if the company expects results within the short term. It is also applicable if the research institute can commit itself to provide defined services. The services shall be provided at market price or at a price reflecting the full costs of the services plus a reasonable margin or resulting from arm's length negotiations.

Licensing agreement: In this case, the company is interested in gaining access to available IP developed and owned by the research institute. The company can either acquire the right to use the results for a specific application or a specific technical field or in a defined territory (licence) or in exceptional cases only acquire the intellectual property rights (assignment). In both cases, this should result from mutual agreement and the research institute shall get a fair compensation, defined according to four different options (see section 29 of the "RDI Framework" included in the bibliography).

Training: In this case, the company trains PhDs or "postdocs" and offers the possibility for these staff members to share their time between the company and a research institute.

For a complete list of terminology go to:
https://www.iprhelpdesk.eu/glossary

KEY MESSAGE 1: THE RESEARCH INSTITUTE'S RATIONALE IS TO GENERATE, DEVELOP, EXPLOIT AND DIFFUSE KNOWLEDGE AND TECHNOLOGICAL ASSETS; THE COMPANY'S RATIONALE IS TO GENERATE VALUE.

R&D collaboration: what does it mean?

EXPECTATIONS AND CONTRIBUTIONS

The **company's** main expectation is to improve and/or develop an **asset** that will lead to a long-term **competitive advantage** on its market. Its main contribution in the first stage is to provide the field expertise and market requirements; in the later development stages, the company adapts the results to its specific environment.

The public **research institute's** main expectation is to generate **new knowledge** and to improve and/or develop assets, that may be both protected and published with a view of future exploitation on other markets. Its main contribution is to generate new technologies based on cutting-edge knowledge in a field, that can be in the later development stages, transferred to match with specific application requirements.

How to start an R&D collaboration?

Before starting in-depth discussions, it is highly recommended that both parties sign a non-disclosure agreement:

IPR Helpdesk template "Mutual Non Disclosure Agreements"

www.iprhelpdesk.eu/node/921

IPR Helpdesk factsheet "Non-disclosure agreement: a business tool"

www.iprhelpdesk.eu/Fact-Sheet-Non-Disclosure-Agreement

When starting discussions on a collaborative research project, the recommendation is to focus on key elements in order to share a common approach between the company and the research institute. The three main steps listed to the right are recommended to ensure that all stakeholders involved share the same view on the collaborative projet.

The main aspects of a collaborative research project shall be clarified before drafting legal agreements.

In order to proceed, two tools are suggested in the appendix:

Tool 1 is a "collaborative research canvas". It builds on the idea of collecting all the relevant information on a single page.

Tool 2 is a "project outline" which helps to raise important issues and to answer these in a meaningful way.

KEY MESSAGE 2: STARTING A RESEARCH COLLABORATION INVOLVES THREE MAIN STEPS:

ALIGNING VISION, GOALS AND MEANS

GETTING PEOPLE TO WORK TOGETHER

DEFINING PROCESSES TO MONITOR THE PROJECT AND OUTCOMES

How should intellectual property rights be managed in R&D collaborations?

When entering into R&D collaborations, parties may bring previously owned intellectual property (IP) assets which are known as **background intellectual property**. Each party should decide on the access rights for other parties to its background, for the purpose of carrying out the project and for the future use of project results.

The project implementation will generate intellectual property, which is known as **foreground intellectual property**.

Agreements on ownership, and access to **intellectual property**, should deal with IP which arise automatically when the IP is created (such as copyright) and with rights which are granted following application (such as patents).

IP OWNERSHIP

Results arising from the research are usually the property of the project partner that has generated them.

In most cases, it is better to have a **clear ownership** situation with **access rights granted** according to the interest and needs of the other party.

Where both parties claim ownership on foreground IP, negotiations might lead to "joint ownership". In the latter case, both parties need the authorisation of the other party to further use and commercially exploit the foreground IP.

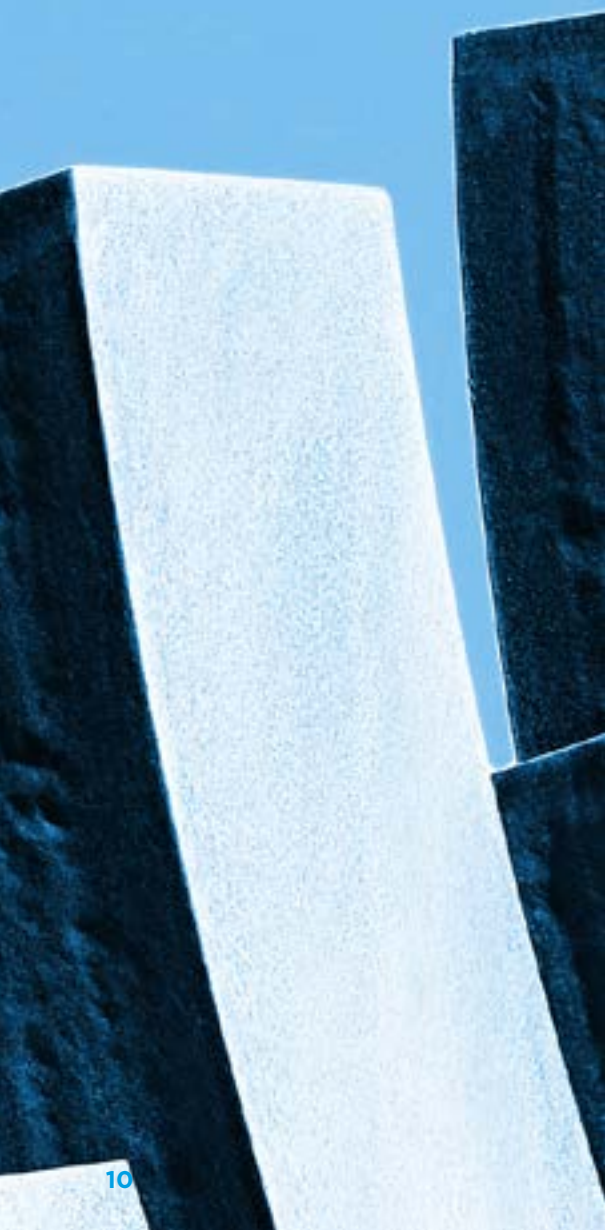
In the case of jointly generated results, as an alternative to a joint ownership regime (generally more complex), project partners can agree that one party to the collaboration owns the IP generated by the project and that the other party has a specified right to use (access right).

ADVICE

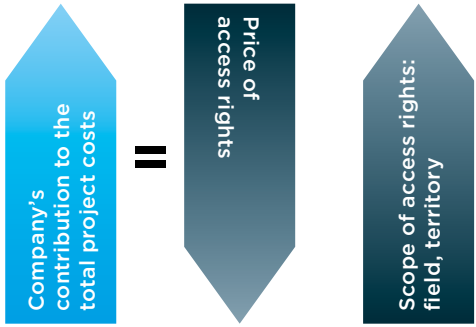
It is of key importance to understand the interest of each party. For what purpose is it important for each party to hold ownership over the foreground IP? The following aspects shall be contemplated when defining IP ownership:

- **What is the relative importance of background IP needed from each party?**
- **What is the intellectual contribution of each party in the foreground IP?**
- **Who is willing to pay for the maintenance of the IP rights?**
- **What is the exploitation plan of the foreground IP? In which domains/ territories is each party interested in exploiting the foreground IP?**

KEY MESSAGE 3: IT IS IMPORTANT TO DISTINGUISH OWNERSHIP OF INTELLECTUAL PROPERTY AND ACCESS RIGHTS TO USE IT.



IP ACCESS



Access rights to use the foreground IP shall be negotiated upfront between the company and the research institute. More favourable conditions can be granted if the company contributes more significantly to a project.

IP ASSIGNMENT

This option is only considered in exceptional cases. If the IP is assigned to the company, the research institute shall receive fair value in return and it should be able to continue its research and teaching in the field and to use the IP to do so.

MONITORING OF RESULTS

It is recommended that any and all project results are documented as to:

- the ownership status;
- the status of the IP protection;
- any restriction on the use and exploitation (freedom to operate);
- an assessment of the value of the IP, to be used as a basis during negotiations.

IP assets can be protected by several types of rights or by trade secret depending on the interest of the parties and their respective IP policies. Consequently, the most appropriate protection strategy must be chosen pertinent to the business strategy.

KEY MESSAGE 4: PROMPTLY AND CAREFULLY REVIEW ALL PROJECT RESULTS TO IDENTIFY IP, WHETHER PATENTABLE OR NOT, THAT MAY HAVE POTENTIAL COMMERCIAL VALUE. CLEARLY DEFINE OWNERSHIP AND ACCESS RIGHTS FOR ANY RESULT ACCORDING TO THE TERMS OF A COLLABORATION AGREEMENT.

PUBLICATIONS

Publishing should not compromise applying for an IP right. The company shall be granted a right to postpone publications for the purpose of applying for an IP right (i.e. patent). The company may also have the right to amend a publication in the case it contains confidential information. In many cases, publications serve both the interest of the research institution and the company.

What project funding is available in Luxembourg for R&D collaborations?

1) FUNDING BY MINISTRY OF THE ECONOMY THROUGH THE RESEARCH, DEVELOPMENT AND INNOVATION LAW

COMPANY PERSPECTIVE

Bottom-up approach: any project fulfiling the funding criteria can be subsidised.

Main assessment criteria for R&D projects:

- economic impact/substance to be achieved;
- co-funding capacity of the company;
- innovative aspect of the project;
- technical challenges to be addressed;
- incentive effect of the aid.

Subsidies can be increased by +15% of total eligible costs in case of an **"effective collaboration"**.

The company is the contracting party. Company contribution to the cost of the research institute is an eligible cost in the company's budget.

Tool 3 details how to set up an "effective collaboration".

2) COMPETITIVE FUNDING AT THE NATIONAL RESEARCH FUND

FOR RESEARCH INSTITUTES AND COMPANIES – PHDS OR POSTDOCS

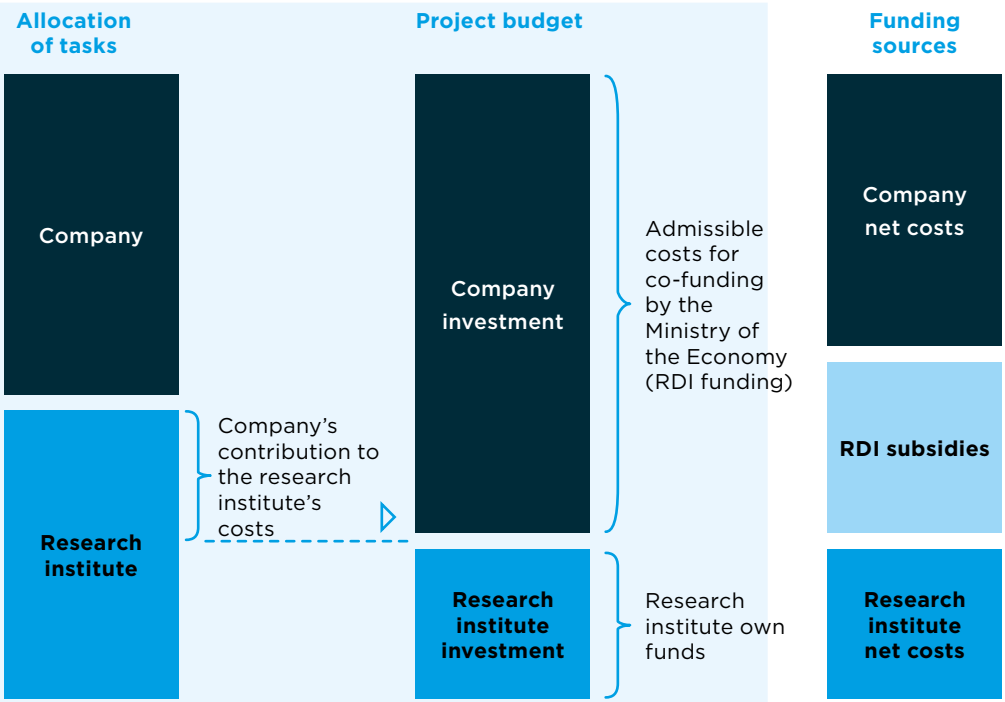
AFR-PPP: PhD or postdoc funding when the incumbent spends part of the time in a research institute, part of the time in a company. Either the company or the research institute may be located in Luxembourg.

Industrial Partnership Block Grant: Luxembourg-based industry partner(s) take the lead in arranging a research programme (allocation of PhD and/or postdoc grants (AFR PPP)) with a Luxembourg based public research institute of their choice.

FOR RESEARCH INSTITUTES – RESEARCH AND DEVELOPMENT

CORE-PPP: project funding for Luxembourg research institutes collaborating with companies. Companies are expected to cover part of the eligible project costs.

SUPPORT PROVIDED BY THE MINISTRY OF THE ECONOMY FOR COLLABORATIVE PROJECTS



How to find an R&D partner

INNOVATION PORTAL
www.innovation.public.lu
Go to: “Find partners”

ENTERPRISE EUROPE NETWORK
een.ec.europa.eu

Contacts for collaborative projects in Luxembourg research institutes

UNIVERSITY (CENTRAL CONTACT POINT)
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DISCUSS YOUR PROJECT WITH LUXINNOVATION WHO WILL BE ABLE TO IDENTIFY RELEVANT RESEARCH INSTITUTES

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UNIVERSITY AND PAUL WURTH GEPROLUX

Big data analysis for making buildings smarter

With smart IT systems, modern buildings can manage heating, cooling and lighting on their own – on a sunny day they will, for example, automatically close the blinds. But there are many factors influencing a building, and getting the programming completely right is not an easy task. Construction specialist Paul Wurth Geprolux has joined forces with the University of Luxembourg to use big data analysis in order to get an in-depth understanding of how buildings behave and thus improve its automation systems.

With its extensive experience of managing major building projects and expertise in the technical engineering of buildings, Paul Wurth Geprolux knows the potential for enhancing existing systems. "In every up-to-date building, large amounts of data are permanently generated by thousands of interconnected devices that operate various systems: heating, air conditioning and so on," explains Paul Schummer, Project Engineer at Geprolux. "This data could tell us a lot about what is going on in the building, how the automated systems respond and what the results are – for example, whether the building is capable of keeping a constant, pleasant temperature without excessive use of the heating or air conditioning."

Analysing these enormous series of data is, however, a daunting task that requires advanced skills in big data analysis, algorithm development and innovative data treatment techniques. In 2015, Paul Wurth entered a four-year research collaboration with the SnT, the Interdisciplinary Centre for Security, Reliability and Trust of the University of Luxembourg. The two partners have started by collecting building data in a large school in Luxembourg for almost a year, and more than 18 million data sets are currently being analysed by the SnT. "Applying our models on a real-life case and working with Paul Wurth's smart building experts allows us to optimise our algorithms in a way we could not have done on our own," says Jacques Klein, Senior Research Scientist at the SnT.

And the knowledge is already being put to practical use. "We are developing visual dashboards that provide an easy overview of what goes on in the building and help detect anomalies," says Mr

Schummer. “Our goal is to help facility managers identify situations when they need to intervene, by reprogramming certain automatic actions for instance. We also want to help everyday users understand why certain actions have been programmed so they don’t manually override them in a way that has a negative impact on the use of resources. If the blinds close when the sun is not yet very strong, it might be to avoid that the building quickly gets too hot and uses more energy for cooling down than what would otherwise be needed.”

The strength of the collaboration lies in bringing together the complementary skills of the partners. “We are confident that the combination of our two worlds will lead us to fruitful results,” Mr Schummer concludes.

LIST AND CARLEX

Collaborating on the windshield of the future

Together, the Luxembourg Institute of Science and Technology (LIST) and Carlex, a high-end American automotive glass manufacturer operating in Grevenmacher, are an excellent example of a promising new collaboration between a research institute and a company.

Under the terms of a joint development agreement signed in the spring of 2017, LIST and Carlex are co-developing a new generation of windshields for automobiles. The goal of the new windshield technology is to reduce the ecological impact of heating and cooling systems in cars through the utilisation of smart coatings. Such achievements will reduce the fuel consumption of cars to meet future EU vehicle emissions regulations, as well as increase the range of electrically powered vehicles.

If successful, it is a win-win situation because the combined effort seeks to satisfy the needs of both parties.

For Carlex, the company, the main expectation is to improve and develop the asset (automotive glass), which will lead to a long-term competitive advantage in its market.

For LIST, the research institute, the expectation is the generation of new knowledge that may be both protected and published with a view of future exploitation in other markets.

A TECHNOLOGY ADAPTED TO THE NEEDS OF THE INDUSTRY

This collaboration is set out to be rewarding for both the company and the research institute.

“After four years of research on transparent nanomaterials, partially supported by the National Research Fund of Luxembourg, LIST’s and Carlex’s ambitious project shows how applied research is evolving towards technology adapted to the needs of the Luxemburgish industry,” says Dr Damien Lenoble, head of the nanomaterials and nanotechnologies unit and head of development of industrial partnerships in the materials department at LIST. “This is just one example of the national industrial reach and impact of the nanomaterial research carried out at LIST.”

“With this significant investment in partnership with LIST and Luxembourg, Carlex expects to offer a disruptive

product innovation out of its Grevenmacher plant," said Michael Bard, Director of Advanced Product Development at Carlex. "We're pleased to take this opportunity to positively contribute to the automotive industry in such an impactful way. We also would like to thank Luxinnovation and MECO (Ministry of the Economy) in Luxembourg for their support of this important endeavour."

TOOL 1

The “collaborative research canvas”

A SUGGESTED APPROACH IS TO ANSWER: WHAT? WHO? AND HOW?

The first step is to define WHAT is to be done within the collaboration. This is about aligning the vision, objectives and resources. It is of utmost importance to be very clear from the beginning on what can be achieved. Never forget that it is about research and that the final result is very difficult to predict. It should much more be about defining research directions.

The second step is to consider WHO will be involved. Defining the relevant information strategy happens at this stage as well. Besides the core team of scientists and technicians who will carry out the work, it is of utmost importance to identify who the legal representatives are in a project. Uusally, there are external stakeholders to consider as well, acting as pilot user(s), a funding body or the company’s customer base who might have expectations.

The last step is to define HOW to proceed. This means defining all the processes related to the implementation of the research collaboration. How will the strategic decisions be taken in the project? How will the project be executed? How will the project monitoring be implemented? How will the results be identified? How will the decision be taken on whether to patent or not? How will the protection be applied for? How will the publications be prepared?

ALIGNMENT (WHAT?)

Objectives
- What are the main expected results?
- What is the project calendar (start/end date)?
- What are the milestones?
- What are the main tasks?
- What is the vision beyond the project?

Resources
- What is each party's relevant background (tools, methods, piece of software, etc.)?
- What are the efforts committed by each party?
- What are each party's financial contributions?
- What external resources are required?

Intellectual property strategy
- What are the requirements of each party in terms of ownership and access rights to background and foreground IP?

PEOPLE (WHO?)

Governance
- Who are the decision-making bodies on each side?

Stakeholders
- Who will carry out the research work?
- Who will manage the intellectual property generated?
- Who will finance IP protection?
- etc.

Audience
- Who shall be informed on the project progress/ results?

PROCESSES (HOW?)

Decision making
- How will the main decisions be taken?
- How may arising conflicts be solved?

Execution
- How will the project results be monitored?
- How will external funding be sourced?
- How will publications be prepared?
- How will intellectual property be allocated?

Dissemination
- How will decisions to apply for IP rights (e.g. patents) be taken?
- How will communications be prepared?

Adapted from the Collaborative Innovation Canvas: Tim Woods, Hype
http://blog.hypeinnovation.com/the-collaborative-innovation-canvas-a-visual-strategy

TOOL 2

The "project outline"

AN ALTERNATIVE TO THE "COLLABORATIVE RESEARCH CANVAS" IS THE "PROJECT OUTLINE" ADAPTED FROM THE LAMBERT TOOLKIT, UK INTELLECTUAL PROPERTY OFFICE.

POSSIBLE APPROACH FOR DISCUSSION

THE PROJECT

1. What are the project objectives?
2. What are the aspirations of each party?
3. What is the start date and the end date of the project?
4. What are the main tasks and responsibilities?
5. What are the milestones/ deliverables to be reached?
6. If work starts before the agreement is signed, is the agreement to have retrospective effect?
7. What resources (human and other) will each party provide?
8. Who are the people who are key to the project?

FINANCIAL CONTRIBUTION

1. Is the research institute's contribution evaluated on a full economic costs basis?
2. What financial contribution will the company and the research institute make?
3. Is this a fixed amount or does it depend on grant applications to be submitted by the research institute?
4. What expenditure will the company reimburse to the research institute in addition to the contribution (cf costs for patenting, specific materials, etc.)?
5. How frequently will invoices be rendered?

6. Are there any terms attached to that external funding that conflict with what the parties want to do? Are any such terms applicable to both parties or just the research institute?

BACKGROUND

1. What background will each party provide?
2. Do other companies in the company's group need to use the research institute's background? If yes, will they agree to keep it confidential?
3. Is some or all of the company's background confidential?
4. May the research institute's staff and students publish any of the company's background? (see "Confidentiality and publication" below)

RESULTS

1. Which party will initially own the IP in the results?
2. If the research institute owns the IP will it:
   - allow the company and its group companies to use that IP in a specific field?
   - allow them to use it in a specific territory?
3. Have the basic terms of a licence been agreed – payment, field, territory, reversion?
4. Have the parties agreed on an IP/patenting strategy?
5. Will the company contribute to costs incurred by the research institute in patenting at the company's request?
6. If the company owns any IP or has exclusive rights, what rights will the research institute have to use the IP:
   - for academic research/teaching/clinical patient care?
   - for the project?
   - for other purposes?

CONFIDENTIALITY AND PUBLICATION

1. For what period is confidential information to be kept confidential after the end of the project?
2. Is academic use/publication of
   - results; or
   - company's background

   permitted in principle, subject to safeguards?

TERMINATION

1. May either party terminate the collaboration if a member of the other's key personnel leaves/is unable to continue and the replacement is not satisfactory?

TOOL 3

How to set up an "effective collaboration"

IN THE CASE OF AN "EFFECTIVE COLLABORATION" MAXIMUM FUNDING RATES PROVIDED BY THE LUXEMBOURG MINISTRY OF THE ECONOMY MAY BE INCREASED BY UP TO 15%.

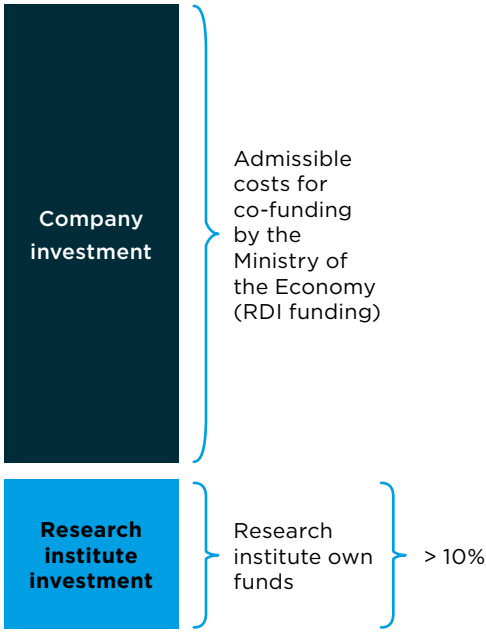
In an **"effective collaboration"** at least two independent parties pursue a common objective based on the division of labour and jointly define its scope, participate in its design, contribute to its implementation and share its financial, technological, scientific and other risks, as well as its results. (...) The terms and conditions of a collaboration project, in particular as regards contributions to its costs, the sharing of risks and results, the dissemination of results, access to and rules for allocation of IPR, must be concluded prior to the start of the project.

Source RDI Framework – section 2.2.2.

The Luxembourg research institutes will provide tailor-made research collaboration agreements.

The aid intensity for industrial research and experimental development may be increased by 15 percentage points if the research institute **bears at least 10% of the eligible costs and has the right to publish its own research results**.

Source: Article 25, General Block Exemption Regulation.



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- European IPR Helpdesk
- RDI Framework - Framework for State aid for research and development and innovation (2014/C 198/01)
- General Block Exemption Regulation – Commission Regulation (EU) No 651/201 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty
- Lambert ToolKit – UK Government Intellectual Property Office
- "Inspiring partnership – the national IP Protocol 2016", Irish Government
- "Your guide to IP Commercialisation", The European IPR Helpdesk – 2016
- "Intellectual property management in open innovation", The European IPR Helpdesk – 2015

THIS GUIDE WAS AUTHORED BY PASCAL FABING, HEAD OF THE NATIONAL FUNDING DEPARTMENT AT LUXINNOVATION.

Through its close proximity to Luxembourg companies and its knowledge of the research environment in Luxembourg, Luxinnovation provides dedicated services to companies looking to collaborate with public research organisations with a focus on project funding. The experience the team has acquired over recent years in various projects has encouraged Luxinnovation to develop this guide as a support to companies before entering into discussions with research organisations.

While Luxinnovation is situated at the heart of Luxembourg's innovation ecosystem and can provide advice, collaborative research means, however, building relationships based on mutual trust with your research partner. Companies are therefore more than welcome to directly contact knowledge transfer officers or technology transfer offices within the research organisations, or use the IPIL (Institut de la Propriété Intellectuelle Luxembourg) services for specific questions related to intellectual property.

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- Ministry of the Economy

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- Luxembourg Institute of Science and Technology
- Luxembourg Institute of Health
- University of Luxembourg.

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