

2021 Insights with Innosuisse



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Swiss Confederation

Innosuisse – Swiss Innovation Agency

Innosuisse is the Swiss Innovation Agency. By strengthening Swiss science-based innovation and entrepreneurship, Innosuisse contributes to the sustainable economic, social and ecological development on a national and global scale.



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We support Swiss companies to preserve the power of innovation

The second pandemic year showed even more clearly how vulnerable our enormously interconnected world, based on the division of labour, is. Accelerated digitisation means that areas of life that were previously largely protected from criminal attacks are now exposed to new threats. Bottlenecks in global supply chains led to additional slumps in the economy, which had already been battered by the pandemic.

At the same time, solutions for a resource-preserving, climate-neutral way of life must be found quickly and on a global scale so that the earth also serves as a basis of life for future generations.

All these challenges require joint action and innovative solutions. The innovations supported by Innosuisse make an important contribution to this end. Companies are looking for sustainable solutions for their business operations to make their company resilient and fit for the future, and they are enlisting the support of science to help them achieve this.

Interest in innovation promotion continues to grow

Demand for **innovation projects** – the core of Innosuisse funding – increased by 13.3%. A total of 887 projects were submitted. This also includes projects from the "Innovative Power Switzerland" impulse programme with reduced contributions from corporate partners. Innosuisse was thus able to respond to the Covid-19 pandemic and further support the innovative strength of SMEs.

The increase in funding contributions is even more significant, as projects from the impulse programme are more expensive on average: At 378 million Swiss francs, the demand for project funding is almost 22% higher than the 2020 figures. All other funding instruments also performed well. In **Start-up Coaching**, the high demand of the previous year was maintained. **Innovation mentoring** was also in great demand: 25% more mentoring vouchers were applied for.

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It must be our motivation to create innovation that actually benefits not only Switzerland but also the international community."

Annalise Eggimann CEO of Innosuisse

> Many good quality applications were received in the **international project** funding category. Unfortunately, however, they could not be adequately rewarded, in particular due to financing challenges of the partner countries – for example, as part of the Eurostars-2 programme from the EUREKA funding initiative – causing the funding rate to drop to a low 24%.

New top-down funding

In addition to the proven bottom-up funding, Innosuisse has set thematic incentives for the first time in the 2021 fiscal year with the **Flagship Initiative.** As part of the first call for proposals, a total of 15 flagship projects with a total funding contribution of around 50 million Swiss francs were approved in October 2021. Within the framework of the Flagship projects, the consortia from science and industry will create promising innovations across disciplines and with a systemic approach; for example, digital solutions in the education, tourism, or healthcare sectors or new approaches for the decarbonisation of the economy and society.

Innosuisse gains more flexibility

In the December 2021 session, Parliament approved the partial revision of the Federal Act on the Promotion of Research and Innovation (RIPA), paving the way for further strengthening the innovation promotion by Innosuisse. In future, for example, Innosuisse will also be able to award direct project contributions to Swiss companies in international innovation projects funded jointly with foreign partner organisations. In addition,

Video – The CEO and the president reflect on why the innovative power of companies is vital to overcoming the crisis and how Innosuisse has been able to respond to the existing challenges.



start-up companies will also be able to claim project contributions directly before entering the market. This will further strengthen the already vibrant start-up scene in Switzerland and make it easier for promising start-ups to venture into their entrepreneurial future.

The provision enabling Innosuisse to directly support highly innovative start-ups and SMEs with project contributions if European funding pots remain inaccessible due to a lack of association with the European research framework programme HORIZON EUROPE is also crucial. This clause was amended by Parliament during the deliberations and adopted unanimously. While this means that direct access to European investment capital remains denied, the measure could open up alternative sources of investment and, in particular, attract national investors – thanks to the quality credentials of Innosuisse's project funding.

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We may not be where we wanted to be due to the pandemic. But ultimately we see that this is a structural crisis and that innovation is probably the best means to get out, ready for the post-Covid world."

André Kudelski President of Innosuisse

"Unusual approaches and risk-taking are important"

What should an entrepreneur do to successfully export innovation abroad?

Felix Moesner: It's essential to do your research beforehand about the market vou want to gain a foothold in. This includes finding out about business opportunities, local trends, the needs of the population and country-specific regulations. Just as important though is knowing about and understanding the country's cultural background. It can also be helpful if you first visit the country as a tourist. Don't be afraid to seek advice and accept help either. In Switzerland, there are various contact points for this - for example, Switzerland Global Enterprise. At Swissnex, for example, we are doing more and more consulting on video tools. If you look for information and advice, you'll build up not just your knowledge, but also gain the self-confidence needed to expand into new markets.

How does Swissnex help Swiss companies export their innovative ideas and products?

First, we evaluate with the start-ups whether the product fits the market



FELIX MOESNER Science Consul and CEO of Swissnex in Japan*

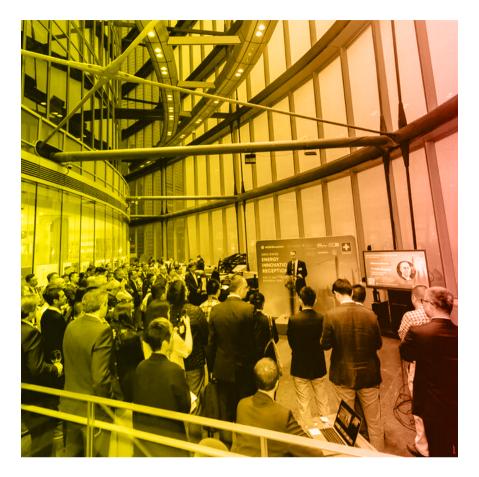
and whether the start-up is ready for expansion. In the internationalisation camps that we run on behalf of Innosuisse, the focus is then specifically on entering the new market: We clarify needs with the start-ups individually. There are a number of ways in which expansion into Japan could look: For example, is it simply a matter of selling products in Japan or is a Japanese company being sought for a joint venture/deeper cooperation? It may also be that a Japanese company can be persuaded to establish a foothold in Switzerland by forming a close partnership with the start-up in Switzerland. Or the Swiss start-up may decide to set up a subsidiary in Japan as it sees great potential in the market there. We offer fast, straightforward solutions - for example, a workplace

before the company sets up its own office on site. Sometimes we simply place suitable new employees. There is no single specific way if a company decides it wants to gain a foothold in the new market. In Boston, Swissnex has so far advised 400 start-ups, in China 300 start-ups, and in Japan, too, it's moving at breakneck speed: although we only started operations here a few months ago, we are already in contact with over 20 Swiss start-ups.

Switzerland is often associated, especially in distant markets, with traditional clichés that have little to do with its modern and innovative side. How can Switzerland better draw international attention to its high-tech achievements?

By actively drawing attention to its innovative achievements. But at the same time, it should also emphasise proven Swiss values. Take the Japanese, for example: traditional values and performance are important to them – I can see many parallels with Switzerland in this respect. I believe we can get a lot more out of it if we try to steer the clichés that Switzerland has abroad more in the direction of innovation. It's important to think and approach things "out of the box". Also to become more risk-averse. Without a willingness to take risks, there would be no innovation. We prove this every single day at Swissnex and Innosuisse. To successfully market Swiss innovation, you can present achievements from Switzerland that are not known abroad, for example.

Let me give you an example: In China, I was fascinated by how many electric vehicles are on the road there. The Chinese are very proud of this and are keen to highlight at every opportunity that they have made e-cars suitable for mass production. But what they did not know was that Switzerland has the fastest electric vehicle. The "Grimsel" car was developed at ETH and holds the Guinness World Record for the fastest electric car. We were fortunate enough to be able to bring the 160 kg autonomous sibling vehicle from the same series to China. During the pandemic, no delegation from Switzerland could travel to Shanghai. We presented the car with the official certificate at various events and exhibitions and were able to show the innovative side of Switzerland. Once we even brought



Read more articles on Exporting Swiss innovations

two superlatives together: the fastest e-car in the tallest building in all of Asia. This triggered a huge response.

* An electrical engineer by training, he has worked abroad for 20 years in various capacities. He managed Switzerland's first science consulate in the US business metropolis of Boston for Swissnex and set up an office in New York. Since then, he and his team have helped hundreds of start-ups and various research institutes successfully network abroad and exchange international knowledge, ideas and talent.

Gaining an international foothold with innovations from Switzerland

Making money with the Swiss brand – but not at any price



Our innovation promotion strengthens the competitiveness of Swiss companies



Gérald Walti CFO / Member of the Executive Committee of Innosuisse

Innosuisse's funding aims to strengthen Switzerland's long-term competitiveness and contribute to positive economic, social and ecological development.

To measure the impact of the funding used, Innosuisse has been conducting a systematic impact assessment of all completed innovation projects since the beginning of 2021. This means that the benefits of innovation promotion can now be demonstrated with concrete figures and its development tracked over time. I am pleased that the results from the first year impressively confirm the positive impacts of Innosuisse's innovation promotion. The figures show that the implementation of the funded innovation projects creates numerous promising jobs and that the funds invested flow back into the national economy within a short period of time.

It is also gratifying to note that a large proportion of the projects funded deal with future-oriented topics such as sustainability or digitisation, thereby strengthening Switzerland's long-term competitiveness.

METHODOLOGY

The impact assessment of the project funding is based on online surveys of the implementation partners at the end of the project and three years later. Therefore, in 2021, all implementation partners of projects completed in the current year (320) and all implementation partners of projects completed three years ago (2018) were surveyed (364). The survey's response rate was 56% for projects completed in 2018 and 70% for projects completed in 2021.





45%

of the companies are still collaborating with their research partner three years after project completion.

Supporting a long-term cooperation

Innosuisse's project funding strengthens knowledge and technology transfer beyond the project's time period. Both will benefit from the continued cooperation in the long term: Business partners from access to knowledge, research partners from the further development and implementation of the innovation.

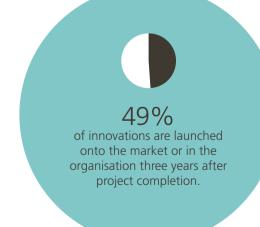


30%

of respondents describe their innovation as a world market novelty.

On the world market

Switzerland is the most innovative country in the world, according to international rankings. Every third innovation supported by Innosuisse is a world market novelty: yet more proof of the success of Switzerland's public innovation promotion.





Successfully bringing a product to market

Innosuisse focuses on the business plans and the implementation of the projects on the market or in companies when assessing the applications submitted. The results prove that the projects are implemented quickly and successfully. 45%

of funded projects pursue radical or disruptive forms of innovation.

55%

of projects deal with

digital solutions.

Enabling radical innovation in Switzerland

Radical technologies or innovations with disruptive effects on markets are often risky. Innosuisse supports innovative companies and their innovations which otherwise would not have been carried out due to high risks, despite a high economic potential.

1,080

jobs were created at companies from the 364 projects completed in 2018.

Measurable economic effects in companies

For the first time, the economic benefit of innovation promotion can be demonstrated using concrete figures. One Swiss franc invested in innovation projects leads to an additional value added of 5.1 Swiss francs for companies over a period of three years.



Supporting digitalisation

The ongoing digital transformation is a strong driver of innovation. Many innovation projects use digitisation to create completely new and innovative business models as part of their process, product or service innovations. Swiss companies thus gain long-term competitive advantages in existing or new markets.



The promotion of innovation: **selected projects** from 2021

Selected projects from 2021

Dissolving micropollutants into thin air

Micropollutants enter streams, rivers and lakes from consumer products such as cosmetics, cookware and textiles, but also from chemicals, pesticides and pharmaceuticals. Once they are in the water cycle, they cannot biologically degrade – i.e. with wastewater treatment plants – and gradually accumulate over time. "Micropollution is a problem everywhere," says Dr. Silvan Staufert, co-founder and CTO of the Zurich-based start-up Oxyle AG. "They are a very insidious form of pollution. It's also very difficult to prove."

It is not the micropollutants themselves that are visible, but increasingly the consequences of them. "In waters downstream of sewage treatment plants, for example, 80 per cent of male fish have been found to be feminised. That's one of the results of putting female hormones in the water. They come from medicines and agriculture."

Completely destroying pollutants

Oxyle was founded in 2020 as a spin-off from ETH Zurich and aims to tackle contaminants where they occur: in manufacturing industry – such as pharmaceutical companies or manufacturers of industrial chemicals – and in municipalities. "We want to bring the purification process as close as possible to the point of production and treat the entire water cycle on site."

The mechanical engineer by training and his business partner Dr Fajer Mushtaq, CEO of Oxyle, have developed special catalysts that can efficiently remove stubborn and toxic pollutants from wastewater. "Our catalysts can break down over 95 per cent of the organic pollutants in water."



Oxyle CEO Fajer Mushtaq adjusts the flow reactor prototype.

Cost-effective and sustainable solution

Unlike other methods, Oxyle's catalysts do not filter micropollutants out of the water cycle, but destroy them altogether. "Our catalytic converters work just like in cars, where the catalytic converter uses the heat of the exhaust gas to destroy the pollutants in the exhaust. Oxyle's catalyst absorbs mechanical stimuli such as vibrations and bubbles. This supplied energy starts a chemical process that destroys micropollutants. The chemical process leaves only clean water at the end and vanishingly little carbon dioxide formed during the purification process."

The idea that impurities can be virtually dissolved into thin air is not new, Silvan Staufert stresses. "But we've now developed an extremely porous material that can be activated very efficiently. As a result, our catalysts have a large surface area and can destroy all types of micropollutants at once. Typical industrial wastewater is cleaned in 20 minutes. The method is efficient and easy to use." The catalyst has an extremely long service life, according to the Oxyle CTO. "That's why its innovation is very cost-effective and sustainable."

Cooperation with a Norwegian company

The aim is now to develop the proven catalyst system further for larger applications – with a flow-through system. Instead of











Working with Innosuisse is very straightforward and practical. They look closely, but don't create a lot of work for us as a company. With European grants, it's more complicated." **Silvan Staufert** Co-Founder and CTO of Oxyle AG

treating the wastewater in a closed tank, as was previously the case, it will now flow in a circuit. To this end, Oxyle is collaborating with the Norwegian company Biowater Technology AS and the Norwegian research institute SINTEF – in a Eurostars project.

Biowater Technology AS has developed a system for small-scale biological wastewater treatment – an important addition for the Swiss start-up: "Biowater is an interesting partner for us. We can learn a lot from an advanced company on how best to work with industry. There are also good synergies between our technologies. Many industries have both types of contaminants – biological and micropollutants. We want to continue to work together after the project is complete and provide solutions to industry and communities together."

Looking to enter the market

The Norwegian research institute SINTEF is helping the two partners to model the processes and optimise them through simulations. "It would be too costly for us as a small company to do this through experimentation."

The Eurostars project is also experimenting with the shape of the catalyst, for example, with pellets that float in the water. Pumping water through the system causes the pellets to swirl in the water. This, in turn, causes them to be pressed together or collide against each other. Thus, energy is generated to destroy the impurities. "Experiments have shown that it's an energy-efficient way to decompose pollutants." Microbubbles formed through strong currents in the water also drive decomposition. When the bubble disintegrates, it triggers a shock wave. This activates the material in the form of the pellets.

Akram Rahimi, Head of Materials Development, shows how the test module equipped with a nano catalyst works.

The specific aim of the project is to produce a pilot reactor in which catalysts destroy micro and other impurities. Then there is to be a three-month trial of a biological treatment at a client's site. "We hope this will provide the important breakthrough that will allow us to enter the market."

No matter which market Oxyle targets first, the potential for their innovation is huge worldwide as micropollutants know no boundaries.

STEP BY STEP TO AN INTERNATIONAL COOPERATION – INNOSUISSE'S CONTRIBUTION

EEN NETWORK: HELP IN FINDING THE RIGHT PARTNERS ABROAD

Finding the right partners internationally and growing is where the Enterprise Europe Network (EEN) helps small and medium-sized enterprises. In Switzerland, Innosuisse is responsible for providing support in the area of research, innovation and technology and links companies with the right partners – as with the Eurostars "Hydrocat" project. Working with Innosuisse is very straightforward and practical, Silvan Staufert enthuses. "The people in charge do look closely, but don't create a lot of work for us as a company. With European grants, it's more complicated."

EUROSTARS: SUPPORT FOR AN INTERNATIONAL PROJECT

For the 36-month collaboration with the Norwegian partners, Oxyle is supported under a Eurostars project. The budget for the whole project is almost EUR 2 million. Innosuisse is supporting the Swiss start-up in financing, setting up contracts and reporting.

CORE COACHING: MAKING THE START-UP FIT FOR THE MARKET

Innosuisse Core Coaching is helping with the growth of the still young start-up and general questions about company development. "This coaching is valuable to us. Our coach Christoph Heidelberger is supporting us in our financial planning, in guestions about organisational structures, how we drive milestones, how to approach investors and other areas. It's a complete package." The support is also very valuable in international cooperation, Staufert stresses. "Our coach has already given us tips on how to collaborate with other companies across borders and which market to target first."

MENTORING: HELP WITH APPLYING FOR A FOLLOW-UP PROJECT

The start-up already has other big ideas and goals and has submitted a new project application. To do so, it enlisted the help of an innovation mentor. He helped Oxyle to successfully push through the application for the Innosuisse project.



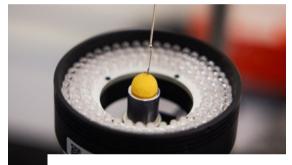
View project



Recognising art forgeries from a photo



"We have already been able to convince a number of investors"



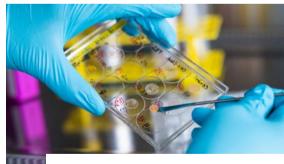
Gene therapy to treat Charcot-Marie-Tooth (CMT) disease



A very effective alarm system for isolated workers



Saving bees from Varroa mites using heat treatment



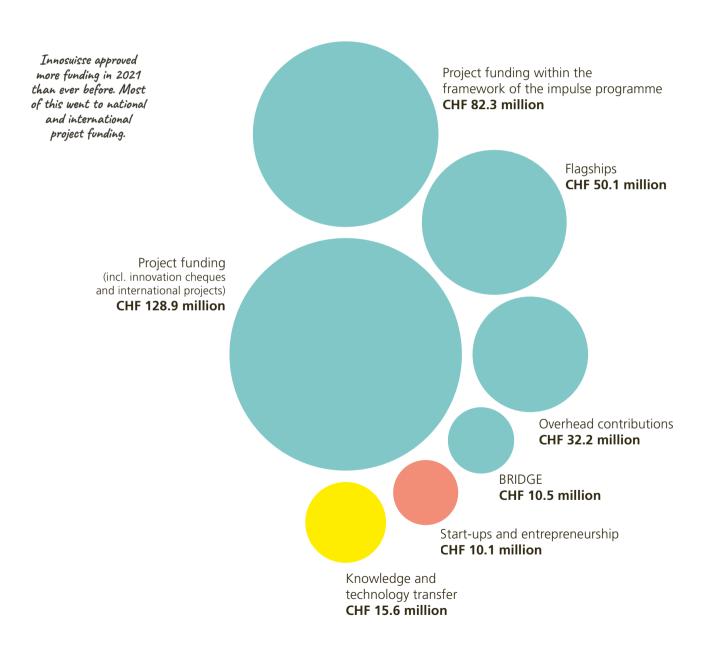
A hand sanitiser that lasts for several hours



Facts and figures: how we promote innovation

Innosuisse approved funding contributions amounting to **CHF 329.7 million** in 2021

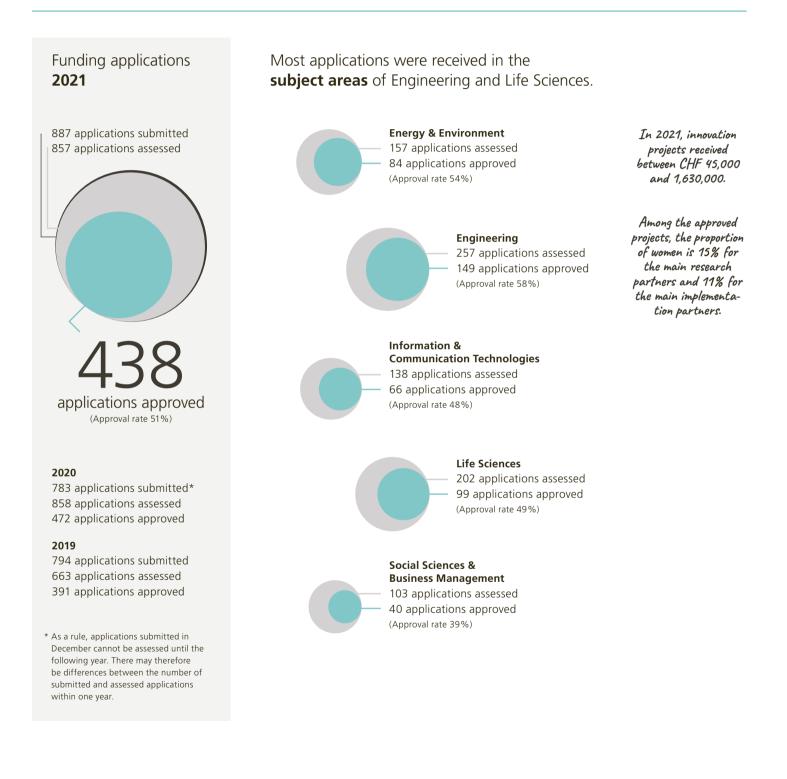
(incl. overheads)



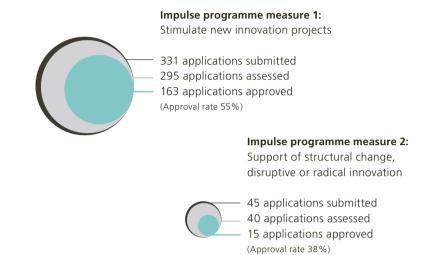
CHF 207.1 million of funding contributions approved National innovation projects



Promotion of innovation projects

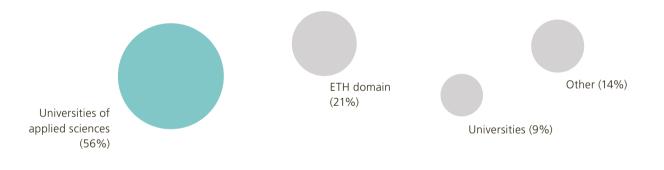


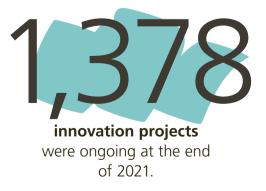
178 of the 438 projects are approved as part of the **Impulse programme.**



For projects under the Impulse programme "Swiss Innovation Power", the contributions of the implementation partners can be reduced compared to the standard innovation projects. Applicants can choose between measure 1 and measure 2.

56 per cent of the research partners participating in the innovation projects are **universities of applied sciences**.





The main implementation partners $\ensuremath{\mathsf{for}}$

approved innovation projects are spread throughout Switzerland. 39 projects have no implementation partners.

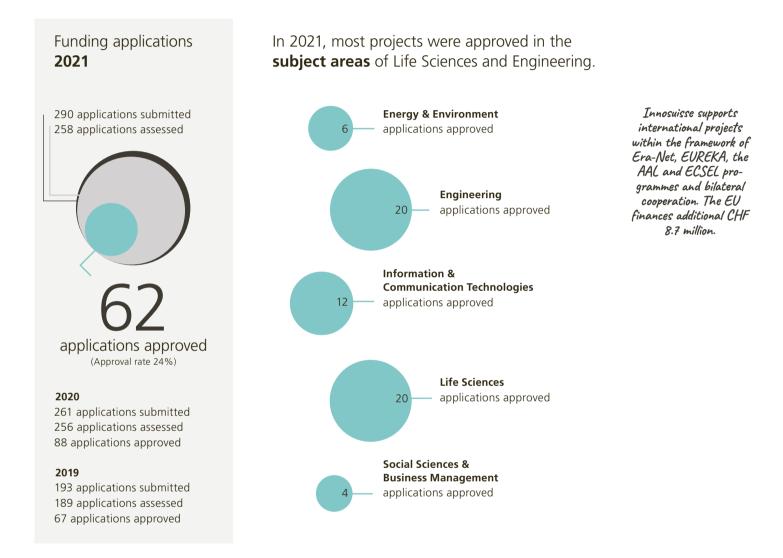


Most of the main implementing partners come from the cantons of **Zurich and Vaud.**

AG(31)	GR	SZ
Al	JU	TG
AR	LU	TI ·····•●······ (16)
BE(39)	NE	UR
BL	NW	VD (50)
BS	OW	VS
FR	SG	ZG•(10)
GE	SH	ZH(116)
GL	SO	Liechtenstein (6)

CHF 20.8 million of funding contributions approved International innovation projects

incl. overheads



31 Swiss research institutions are involved

in approved international projects.



Universities of applied sciences (12)

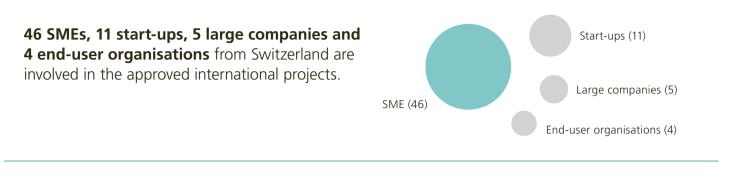


Universities (5)





Promotion of innovation projects



The **cooperation partners** in international projects for 2021 come from 27 countries.

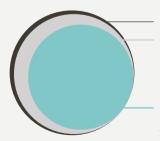
Number of cooperation partners 0 1-4 5-910-14 15-19 > 20

Within approved international innovation projects, the proportion of women is 20% among the Swiss main research partners and 15% among the Swiss main implementation partners.

CHF 8.6 million of funding contributions approved Innovation cheques



Funding applications **2021**



814 applications submitted 753 applications assessed

578 applications approved (Approval rate 77%)

2020

709 applications submitted659 applications assessed497 applications approved

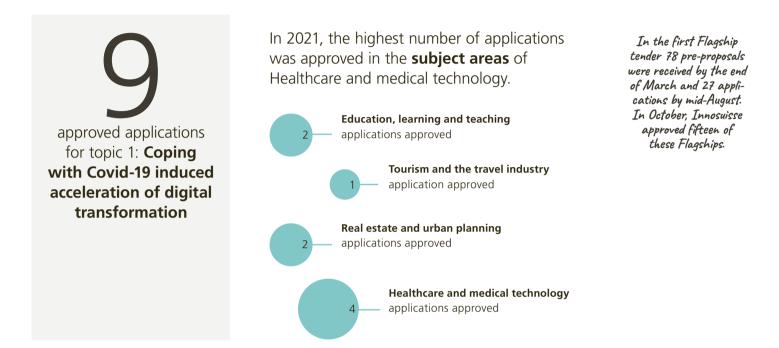
2019

559 applications submitted 513 applications assessed 400 applications approved In 2021, a particularly large number of SMEs or other organisations applied for an innovation cheque for research services of a maximum of CHF 15,000.

CHF 57.0 million of funding contributions approved **Flagships**

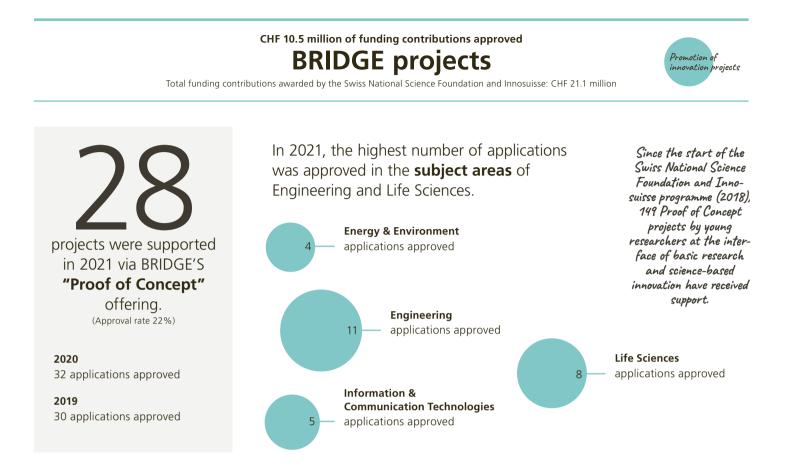
incl. overheads of CHF 6.9 million





approved applications for topic 2: Improving the resilience and sustainability and reducing the vulnerability of society, infrastructure and processes Most of the approved projects were in the **subject area** of Decarbonisation.

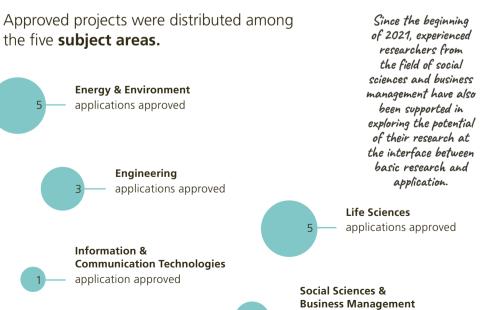






2020 9 applications approved

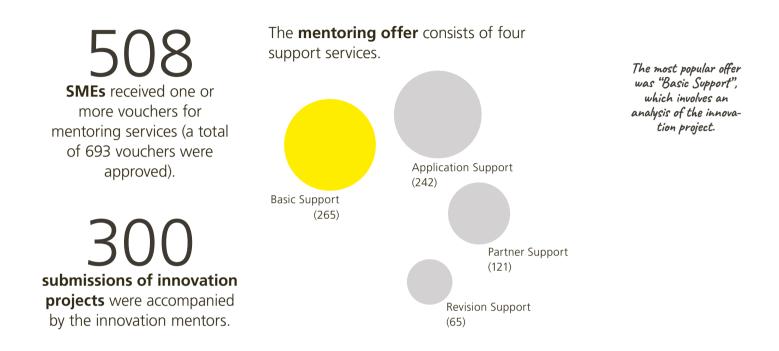
2019 10 applications approved



applications approved

CHF 2.7 million of funding contributions approved





CHF 0.9 million of funding contributions approved EEN: International matchmaking, technology and partner search



Bandom Swiss SMEs took part in 51 co-organised events worldwide (mostly online) and in around 960 bilateral meetings with potential foreign technology or innovation partners.

Around



In 2021, advisory meetings and the provision of international contacts by the 6 EEN advisors in Switzerland continued to be in great demand.

CHF 10.6 million of funding contributions approved **NTN Innovation Booster**



In 2021, the first 12 **NTN Innovation Boosters** started operations. In the fall, an additional 6 Innovation Boosters were approved for 2022–2025. They will start in January 2022. The total of 12 active Innovation Boosters have launched around



The NTN Innovation Boosters themselves have invested a total of around CHF 800,000 in the ideas.

5,547 participants were involved in NTN Innovation Booster events. The Innovation Boosters have attracted **participants** from the research community as well as from business and society.

53% from the business and social sectors

47% from the academic field

33% of speakers at NTN Innovation Booster events were women. Among participants, the figure was 26%.

CHF 1.3 million of funding contributions approved Partnerships and events



Innosuisse entered into

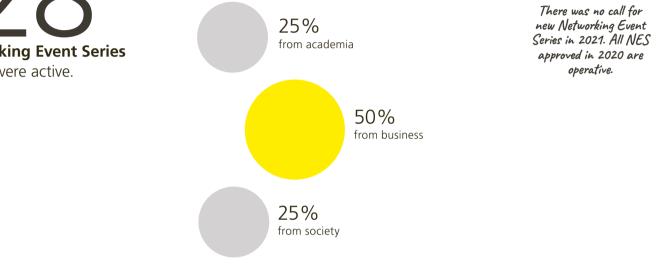


partnerships in 2021 in order to present its promotional offering, for example at events or in communication media. Due to the coronavirus pandemic, 5 events were held in hybrid format and 4 exclusively virtual. 1 event was cancelled. CHF 0.2 million of funding contributions approved
Networking Event Series





Participants in the Networking Event Series are half from the business world and and a quarter each from research and society.



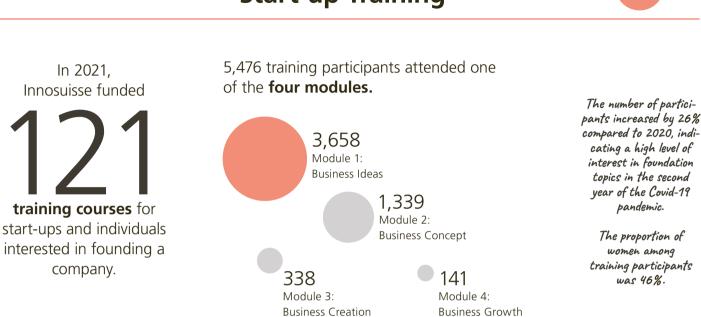
More than

individuals participated in the events.

40% of the speakers of the events were women.

More than 30% of the participants were women.





CHF 4.3 million of funding contributions approved Start-up Coaching

at a very high level in 2021.

Demand for **coaching** remained constant

Initial Coaching

(Approval rate 75%)

Core Coaching 146 evaluated 83 accepted

(Approval rate 57%)

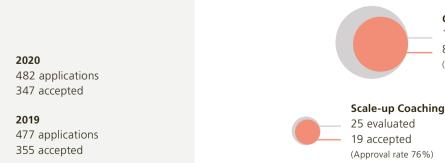
288 evaluated

217 accepted

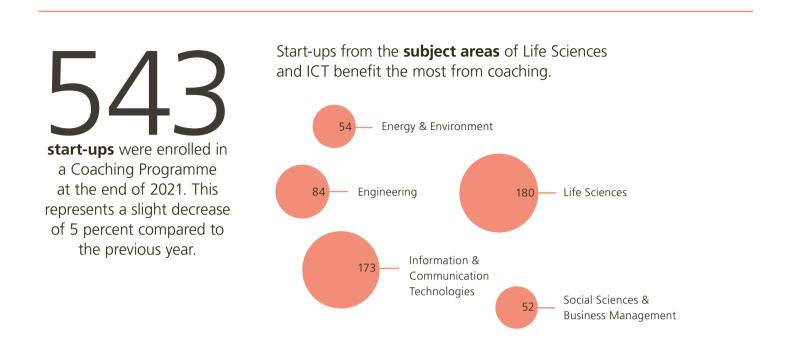


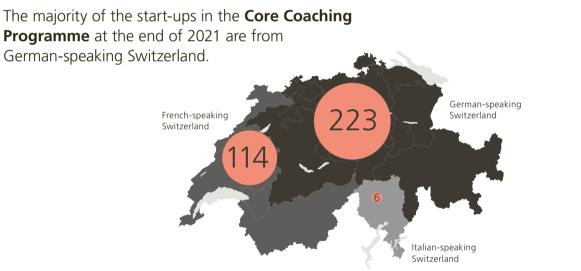
Support for start-u

476 start-ups applied for one of the three Coaching Programme at Innosuisse in 2021 and 319 were accepted.



23 start-ups received the Innosuisse Certificate at the end of the Core Coaching Programme, confirming they are "ready for sustainable growth".





20% share of women in the management team of start-ups in initial, core or scale-up coaching.

The canton of Zurich has the most **start-ups** in the Core Coaching Programme.

AG	•••••	(7)	GR		(0)	SZ	•••••	(6)
Al		(0)	JU		(0)	TG	•••••	(2)
AR		(0)	LU	•••••	(5)	ΤI	•••••	(6)
BE		(31)	NE	•••••	(7)	UR	•••••	(1)
BL	•••••	(7)	NW	•••••	(1)	VD	(77)
BS	•••••• ((14)	OW		(0)	VS	•••••	(4)
FR	•••••	(3)	SG	•••••	(8)	ZG	•••••	(7)
GE	••••••	(23)	SH		(0)	ΖH	(1	28)
GL		(0)	SO	•••••	(6)	Liec	htenstein	(0)

CHF 1.1 million of funding contributions approved Internationalisation camps



CHF 1.1 million of funding contributions approved International trade fairs Support for start-ups

conducted virtually.

Support for start-u

94 start-ups were able to present themselves at international trade fairs in 2021 thanks to Innosuisse. With the support of Innosuisse, start-ups cannot only exhibit at leading international trade fairs in the Swiss Pavilions, they can also visit suitable trade fairs of their choice as part of the "Pick your Fair" programme.

All figures stated in this report have been individually rounded.

Frequently used abbreviations

- EEN Enterprise Europe Network
- Empa Eidgenössische Materialprüfungs- und Forschungsanstalt
- EPFL École polytechnique fédérale de Lausanne
- ERA European Research Area
- ETH Eidgenössische Technische Hochschule
- NES Networking Event Series
- NTN National Thematic Network
- NTN IB National Thematic Network
- Innovation Booster
- SME Small and medium-sized enterprise
- SNSF Swiss National Science Foundation

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