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# BUSINESS FINLAND ADVANCING CLEANTECH AND BIOECONOMY

## Evaluation of three innovation and six export promotion programs

Program evaluation report

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## OBJECTIVES AND BACKGROUND

This evaluation analyses the results, relevance and impacts of nine cleantech and bioeconomy programs by Business Finland and its predecessors Tekes and Finpro. The evaluation also contributes to understanding how programs contribute to implementing national strategies.

The evaluation covers three innovation programs and six export promotion programs. Tekes innovation programs aimed at creating new products and services as well as new business development and market entry promotion. Finpro export promotion programs supported foreign market entry and accelerating growth in international markets.

| PROGRAM | OBJECTIVES |
|---|---|
| **Tekes innovation programs** | |
| **BioNets (2016–2018)** | Create new bioeconomy solutions, services, and networks in Finland, and enhance innovative international business. |
| **Cleanweb (2016–2018)** | Create rapidly scalable cleantech business operations and accelerate the market entry of SMEs in the sector. |
| **Arctic Seas (2014–2017)** | Promote the creation of new businesses in eco-efficient marine solutions and the sustainable use of marine resources. |
| **Finpro export promotion programs** | |
| **Cleantech Finland (2008–2019)** | Support growth of Finnish companies operative in the cleantech sector and environmental technology. |
| **Innovative Bioproducts Finland (2016–2018)** | Help Finnish companies producing bioproducts to enter growing markets, accelerate their international growth, and support companies' capabilities to be successful internationally. |
| **Wood from Finland (2015–2018)** | Help mechanical forest industry companies find new growing markets and customers and increase the sales. |
| **Waste to Energy and Bioenergy (2015–2017)** | Open new markets and accelerate Finnish exports and company growth in the energy and bioenergy areas. |
| **Beautiful Beijing (2013–2017)** | Help Finnish cleantech providers enter Chinese value networks and gain customers and sales in China. |
| **Arctic Maritime and Offshore from Finland (2015–2017)** | Accelerate the growth of Finnish maritime business and enable a joint offering by building a network of Finnish companies. |

The evaluation combined several complementary methods and materials. Company-level data provided by Business Finland was analysed quantitatively to detect economic impacts of the programs. A survey explored beneficiary perceptions of the added value of the programs. In-depth interviews with beneficiaries, program managers and policy makers helped in understanding better program governance, impact mechanisms and contribution to policy objectives. Finally desk research of program documents and policy strategies was carried out to analyse the contribution to national strategies and to provide general background information for the whole evaluation.

## MAIN CONCLUSIONS

The evaluated programs were **timely, thematically relevant and somewhat aligned internally**. Some programs practiced new approaches and developed ground for new programs.

The evaluation identified **three main challenges in program governance**. First, the way changes in original plans were made was not transparent and lacked full endorsement from all parties. Second, programs did not always have sufficient human resources to manage the programs. Finally, sustainability impacts of the programs cannot be estimated due to the lack of clear objectives and systematic monitoring.

**Programs and national strategies were relatively well aligned** as thematically both emphasise sustainable development. The central role of bioeconomy and cleantech in national strategies is mirrored well in the focus areas of several programs. However, the programs generally focused on delivering economic outcomes. The potential sustainability impact is likely to be indirect as a result of the products developed and adopted replacing existing ones with more harmful environmental impacts. The awareness of environmental sustainability and opportunities this can offer in international markets may have increased.

Beneficiaries **consider program services to be relevant and appreciate their quality**, with some variation depending on e.g. the program and company size. Funding was seen as the most important contribution by innovation programs, but services seem to have contributed to product development. Delegation trips, exhibitions and country branding were reported as most relevant services in growth programs. Beneficiaries are also satisfied with the information provided about the services. However, they also suggest that services should be more targeted and have a narrower focus.

In general, the programs **succeeded in achieving defined objectives**. In most of the programs a majority of the beneficiaries have introduced new products, entered new markets or established new partnerships. International competitiveness has possibly been strengthened

as demonstrated by increased exports and turnover compared to industry averages in most business sectors.

The **programs had positive incentive effects**. The projects might not have been implemented or would have been implemented at a smaller scale without program engagement. Growth programs supported entering more foreign markets. Innovation programs helped to develop business plans and new products.

The positive results are supported to some extent by **economic impact analysis**, with differences across programs and sectors. Companies participating in both growth and innovation programs tended to perform better than non-participants or those participating in only one program, with young firms benefitting more. It is harder to identify robust evidence of effects from participation in only one program. However, this may be due to methodological and data limitations or the fact that benefits may materialize later in the future.

## KEY RECOMMENDATIONS

Business Finland should consider setting **goals for the broader societal impact** of the programs. Goals for sustainability impact could relate to the handprint – the positive environmental impact – of the products provided by participating companies. Sustainability outputs and outcomes could be based on metrics such as greenhouse gas emissions, energy or resource use or air and water pollutants, building on established tools. Results should be reported and reviewed annually.

**Major changes to programs** should undergo a similar level of scrutiny and decision-making process as launching the programs. Pivoting during the program must be reported and endorsed by the program steering group.

**Programs and national strategies should be better aligned.** The strategies could present expectations for Business Finland and the programs could elaborate on how different activities contribute to implementing the strategies.

Success of the programs depends on **sufficient and qualified program personnel**. Attracting and maintaining enough people in program management throughout the programs should therefore be prioritized.

Business Finland should consider developing a systematic **monitoring, evaluation and learning (MEL) framework**. This would include the expected outputs, outcomes and impacts of the programs. The framework would also detail the procedures for monitoring of program services and information reported by participating companies. The implementation would prescribe standardized forms and documentation, enabling efficient and effective monitoring, evaluation and learning.

**Growth program services should be more specific and narrower.** Tailored services should be available for

e.g. companies having first steps in export and more experienced exporters. Programs should focus on outcomes instead of outputs – or quality over quantity. Services should also be well advertised to the beneficiaries.

The process of choosing program priorities should include **an assessment of key sustainability risks** and measures to mitigate them. If activities are considered in high-risk sectors, they should undergo thorough scrutiny, with a decision by the Business Finland board. Business Finland should also consider quantitative targets for funding allocated to addressing sustainability challenges.

Companies and activities selected to participate in programs should be screened against **clear and transparent sustainability criteria**. These should include both contributing to positive impacts as well as reducing negative impacts and managing risks. Requirements and criteria could be differentiated based on the size of the company or project.

# 1 BACKGROUND AND OBJECTIVES

The aim of this evaluation is to produce an analysis of the results, relevance and impacts of several programmes of Business Finland and its predecessors Tekes and Finpro. The evaluation also strived to help in understanding how programs help in advancing and implementing national strategies.

Finland is considered as one of the leading countries in balancing the different aspects of sustainable development. This cross-cutting and synergistic approach is reflected broadly in public policy. For instance, the Finnish Bioeconomy Strategy argues: "By exploiting our biomass resources and expertise, Finland can contribute sustainable solutions for global efforts to mitigate climate change and for the dwindling of natural resources. At the same time, we can generate new, sustainable economic growth and well-being for the Finnish people."

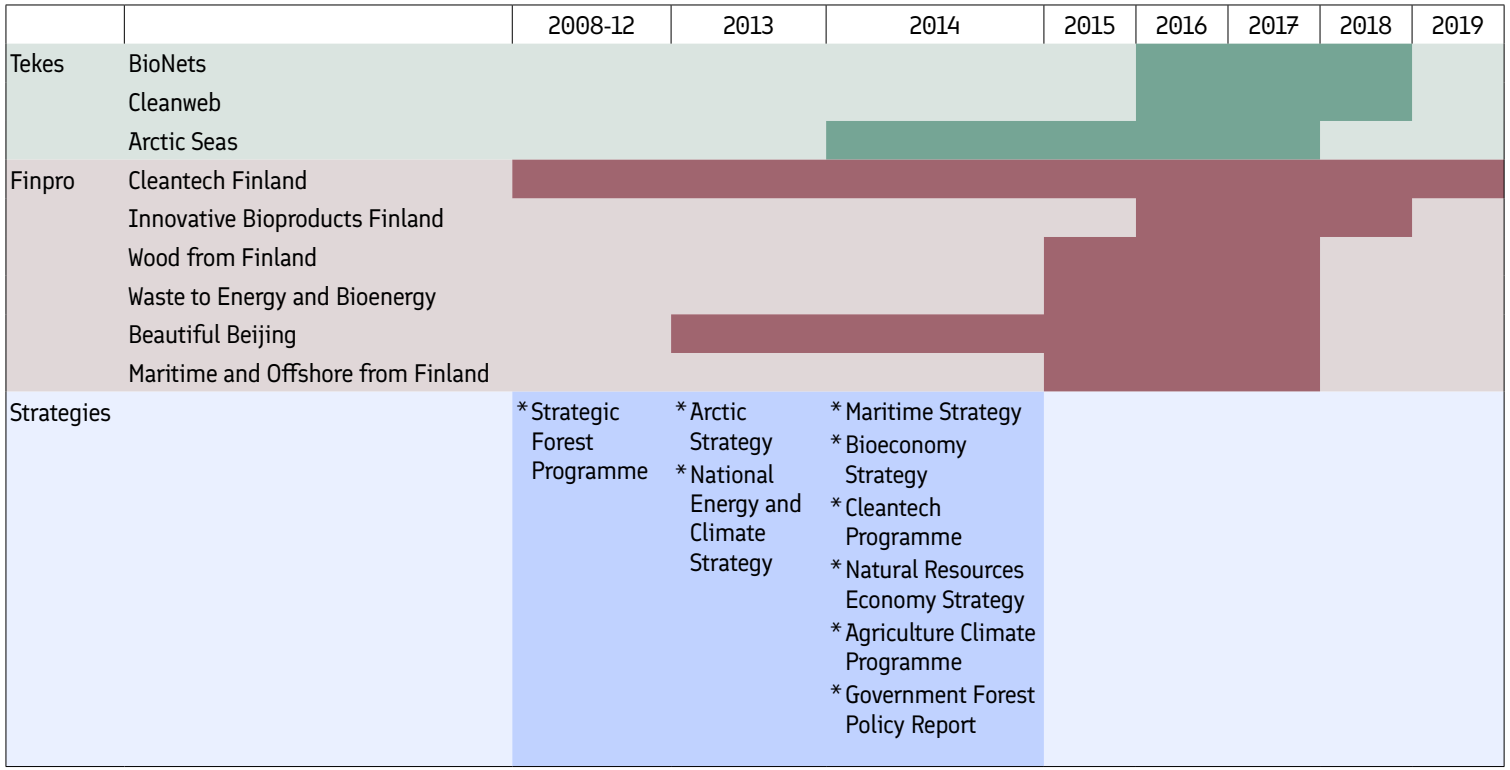
Finland has a rich tradition of presenting policy priorities through national strategy documents. These documents, often drafted in a collaboration between various ministries and agencies and with engagement from key stakeholders, can take different forms, but tend to include analysing the current situation and challenges; presenting a future vision, narrative and key goals; as well as outlining next steps, including various policies and measures.

Business Finland is one of the key institutions in a position to contribute to implementing national strategies, both through funding and services provided. Business Finland programs tend to be well aligned with policy priorities, in particular addressing sustainability challenges and supporting economic growth. However, the way in which the stated intentions in policy documents trickle down to impacts through projects and services is a more open question and among others was explored in this evaluation. Figure 1 below summarizes the time-table of the evaluated programs as well as key government policy documents that these programs thematically align to.

In 2018 Tekes and Finpro merged forming the current Business Finland. Tekes and Finpro have significantly supported Finnish businesses in their efforts in developing new bioeconomy and clean technology solutions as well finding new markets for these solutions. Business Finland Strategy 2025 has a strong sustainability focus. The strategic purpose is defined as generating

prosperity by accelerating Business Finland customers' sustainable growth. This requires an assessment of how programs have worked in terms of contribution to company development, internationalization and sustainability thus helping to achieve policy objectives. This evaluation aims to produce an analysis of the results, relevance and impacts of several bioeconomy and cleantech programs of Business Finland and its predecessors Tekes and Finpro, and to help in understanding how programs help in advancing and implementing national strategies.

FIGURE 1. Time-line of Business Finland programs and key national strategies.



The evaluation addressed the following research questions:

- What concrete results have each of the programs created?
- What have been the impacts of the programs?
- How well have the objectives set for the programs been achieved?
- What can be said about programs as tools for advancing and implementing national strategies?
- How well did the programs support each other?
- How relevant have the programs been in implementing the national strategies?
- What has been the main added value from the programs to the national strategies and policy objectives?
- How relevant have the programs been to the participating companies (main beneficiaries)?
- What has been the main added value from the programs to the participating companies?
- How successful were the programs in selecting their target groups and in reaching them?
- How have the programs contributed to sustainability, and how could the impact on sustainability be improved?
- How well have the objectives set for the programs been achieved?
- Which program services have worked well and which have not, and why?
- What have been the mechanisms of impact of successful services?
- What have been the critical bottlenecks or obstacles, if any?

The evaluated programs are summarized in Table 1 below and further detail is provided in sections that follow. The evaluation covered three Tekes innovation programs and six Finpro export promotion programs. Innovation programs aimed at creation of new products, services as well as new business development and market entry promotion. Export promotion programs aimed to support foreign market entry and accelerate growth in international markets for bioeconomy and clean technology solutions.

TABLE 1. Summary of the programs.

| PROGRAM | OBJECTIVES | TARGET GROUPS | FOCUS |
|---|---|---|---|
| **Tekes innovation programs** | | | |
| **BioNets** | Create new bioeconomy solutions, services, and networks in Finland, and enhance innovative international business. | Companies introducing bio and circular economy products/services. Ecosystems. | Bio and circular economy – recycling, packaging, wood fiber materials |
| **Cleanweb** | The program aimed to create rapidly scalablecleantechbusiness operations and accelerate the market entry of SMEs in the sector. | Cleantech SMEs | Digitalization and consumer-driven business models, solutions for circular economy, promoting access to the US markets |
| **Arctic Seas** | The program aimed topromote the creation of new businesses in eco-efficient marine solutions and the sustainable use of marine resources. | Maritime sector companies | Ship and marine, arctic and other maritime transport, offshore industry and environmental technology. |
| **Finpro export promotion programs** | | | |
| **Cleantech Finland** | Aimed to support growth of Finnish companies operative in the cleantech sector and environmental technology. | Cleantech and environmental technology companies | Main target markets were Europe, Russia, India and China |
| **Innovative Bioproducts Finland** | Aimed to help Finnish companies producing bioproducts to enter growing markets, accelerate their international growth, and support companies' capabilities to be successful internationally. | Companies operating in innovative bioproducts, circular economy, and innovative treatment technologies for biomass. | The main target market countries were the Netherlands, Belgium, Germany, USA, the UK, Sweden and Japan. |
| **Wood from Finland** | Aimed to help mechanical forest industry companies find new growing markets and customers and increase the sales. | Mechanical forest industry companies. | The main target market was China, but the program also exploredother potential markets such as India. |
| **Waste to Energy and Bioenergy** | The program had the goal of opening new markets and accelerating Finnish exports and company growth in the energy and bioenergy areas. | Companies operating in waste to energy area. | Main markets were Asia, Africa and Latin America. |
| **Beautiful Beijing** | Aimed to help Finnish cleantech providers enter Chinese value networks and gain customers and sales inChina. | Focus areas included energy production and distribution, construction, traffic, industry and air quality. Especially companies operative in water and air purification and in soil cleansing. | China |
| **Arctic Maritime and Offshore from Finland** | Aimed to accelerate the growth of Finnish maritime business and to enable a joint offering by building a network of Finnish companies. | Finnish companies operating in shipbuilding, offshore, and in maritime technologies and construction. | Shipbuilding and oil and gas projects in international markets. |

## 1.1 INNOVATION PROGRAMS

### BIONETS

The BioNets program (2016–2018) focused on bioeconomy and circular economy. The program funded around 130 projects and around half of the beneficiaries were companies. Other beneficiaries were universities, research institutes and foundations. The BioNets program funded projects with around 46 million euros (€33.5 million to companies, €12.3 million to research organizations). The program funded mainly large companies and research institutes whereas the CleanWeb program focused on SMEs.

The program aimed at generating and strengthening innovative business ecosystems and business development platforms to create new bioeconomy and circular economy solutions and projects. One goal was to pilot new solutions at an early stage. The program also trialed a new model for ecosystem funding and supported the cooperation of companies to create new biobased solutions.

The BioNets program developed five ecosystems where companies, research organizations and other organizations cooperated to create new solutions. Networks were supported by the new ecosystem funding and the ecosystems covered topics related to nutrient recycling, textile recycling, packaging, cellulose and fibre products and lignin products. Tekes funded the ecosystem orchestrator who was responsible for developing the ecosystem further independently.

The program offered funding especially for projects creating ecosystems and pilot solutions based on customer needs. The program also provided coaching and support in building networks and ecosystems and information through studies and market opportunity analyses. BioNets cooperated closely e.g. with CleanWeb and Finpro's Innovative Bioproducts program. BioNets focused on supporting the ecosystems and providing innovation funding whereas Innovative Bioproducts supported companies' entry to market.

### CLEANWEB

The CleanWeb program (2016–2018) focused on cleantech SMEs and helped them to grow and create scalable cleantech business operations. The program focused especially on digitalization, consumer businesses and circular economy solutions and promoted access to the US market. Program funded 86 projects with around €26 million (€25 million to companies and €1 million to research).

The principal aim of the program was to speed up the scaling of cleantech SMEs for the international market and making cleantech into a competitive sector. The program aimed also to increase cleantech companies' expertise and support companies to communicate their solutions more effectively. The focus of the program was particularly in the US market and the program aimed at developing companies' competence and skills to support their internationalization.

The CleanWeb program funded companies that were related to the cleantech and prioritized projects that leveraged digitalization to increase competitiveness. As CleanWeb focused also on the US market, the program offered funding for projects that were seeking to internationalize. Funding was also available, for example, to increase customer insight and brand development. Besides funding, CleanWeb provided services that included e.g. matchmaking and networking events, boot camps, coaching, workshops and training. The program also opened doors to business acceleration centers (e.g. in California). CleanWeb cooperated e.g. with the BioNets program.

## ARCTIC SEAS

The Arctic Seas program's (2014–2017) focus areas were ship, marine and offshore industry, Arctic and other maritime transport, digitalization and environmental and energy technology. Program funded around 140 projects and beneficiaries were mainly companies but included also universities and research institutes. The Arctic Seas program was launched mainly in response to problems in the maritime industry in Finland. The total budget of the program was around €100 million (Tekes €45 million).

The program targeted at strengthening the development of the maritime industry and the know-how of the Arctic environment. The program aimed also at supporting the creation of new businesses in eco-efficient marine solutions and growth in international markets, for example, in Norway and Brazil. Another objective was to turn Finland into an internationally attractive concentration of Arctic know-how and network Finnish actors into internationally significant investment projects.

Besides funding, the program also provided e.g. networking events, seminars and workshops. Several events focused, for example, on low-emission solutions and digitalization. The program collaborated closely e.g. with Finnish Marine Industries. The program initially focused on the Arctic but shifted to focus on maritime challenges more broadly. Digitalization and autonomous maritime navigation turned out to be especially important themes to the program.

## 1.2 GROWTH PROGRAMS

### CLEANTECH FINLAND

The Cleantech Finland program (2008–2019) focused on boosting the internationalization of Finnish cleantech companies. Around 250 Finnish companies participated in the program representing different roles in the cleantech value chains. Initially, the reason behind the launch of the program was to increase the visibility of the Finnish cleantech sector and it focused on marketing communications.

The Cleantech Finland program aimed at supporting cleantech companies' sales in the key market areas and strengthening Finland's reputation as a leading cleantech country. The program targeted also, for example, at building, expanding and developing the cleantech network, supporting cooperation between the companies and increasing visibility of the Finnish cleantech solutions. Due to the length of the program, focus areas and targets of the program changed slightly during the years from marketing communications to include also e.g. business promotion.

At the core of the program's activities was the Cleantech Finland brand. Members had a right to use the brand in their marketing communication and membership offered contacts and networks to both Finnish and foreign companies and financiers. The program provided business delegation trips, seminars, matchmaking and networking events and other types of events both abroad and in Finland and offered visibility from joint marketing and communication efforts.

Becoming a member of the Cleantech Finland required that the company had a business based on the cleantech solutions, aim to advance sustainability and was committed to develop its cleantech operations. The solution could have been a direct answer to a significant environmental challenge or a part of the value chain. Additionally, the company had to operate or have plans to expand its operations internationally, have concrete growth targets and operate responsibly. Thus, a wide range of businesses and operations were included in the program.

### INNOVATIVE BIOPRODUCTS

The Innovative Bioproducts program (2016–2018) focused on Finnish companies that operated in the circular economy and innovative treatment technologies for biomass with willingness and capabilities for international growth. Around 20 companies participated in the program covering various fields from furnishing to packaging and from textiles to cosmetics. The program's main target markets were the Netherlands, Belgium, Germany, the USA, the UK, Sweden and Japan.

The program's objective was to identify the top companies in the sector and support and accelerate their

international growth. The program aimed at increasing the export and turnover of the participant companies, supporting them in reaching new markets, recognizing potential customers and networking with Finnish and international investors. The program also targeted at presenting Finnish offering in target countries and bringing foreign investments to Finland.

The Innovative Bioproducts program provided different services to its participants. It offered access to seminars, exhibitions and conferences e.g. in France and Japan and organized delegation trips and B2B meetings in Finland and abroad. The program provided training and courses, for example, in marketing and pitching. Companies received market information on the target markets and support to develop capabilities for export. The program also did marketing communications in the target market areas aiming at highlighting Finnish know-how and increasing companies' visibility.

## WOOD FROM FINLAND

The Wood from Finland program (2015–2018) focused on supporting Finnish mechanical forest industry companies to find new markets and increase sales. Around 20 Finnish companies participated in the program representing more than half of Finnish sawmill production. The main target area of the program was China but it also explored other market areas such as Iran and India.

The program aimed at boosting the turnover of Finnish sawmills and increasing their exports to China and other developing markets with over a million cubic meters. The program also targeted at creating more than 2 000 new Finnish jobs to the value chain. As the main target area of the program was China and the majority of the resources were directed there, two local experts were hired in China to support the execution of the program. The program exceeded its export targets.

For its participants, the program offered market information covering China, support from Chinese experts, fact-finding trips, delegation visits and buyer meetings. Wood from Finland participated and organized exhibitions, seminars, matchmaking events, conferences and roadshows. Thus, companies could widen networks both in Finland and in target markets and develop their export capabilities. The program closely collaborated with the Finnish Sawmill Association.

## WASTE TO ENERGY AND BIOENERGY

The Waste to Energy and Bioenergy program (2015–2017) focused on supporting Finnish companies offering solutions to global challenges in waste management and energy production. Around 50 companies participated in the program providing technology and solutions for the whole value chain from feedstock processing to energy generation and biofuel production. The program's target

market areas were located mainly in Asia, Africa and Latin America.

The program aimed at increasing companies' sales and export, providing them new business opportunities in new market areas, building cooperation networks and supporting their international growth. The program targeted to increase companies' turnover by 5–10%, create new jobs and facilitate joint projects between the program's companies. Additionally, the program's goal was to increase companies' know-how and competence.

For its participants, the program provided training, sparring and courses on marketing materials and pitching to increase companies' competence. Delegation trips were organized, for example, to Brazil, Chile and Iran. Additionally, fact-finding and B2B-meeting trips were organized in several countries (e.g. Chile and South Africa). The program carried out also a market research including 20 countries and did marketing communications in the target market areas to highlight the Finnish know-how in the energy sector.

## BEAUTIFUL BEIJING

The Beautiful Beijing program (2013–2017) focused on increasing the cleantech sector's export in the Chinese market. Over 100 Finnish companies participated in the program covering several fields including energy, construction and design, air quality, environmental solutions and industrial solutions. Some companies were already in China but for some the market area was new.

The program aimed e.g. at creating business opportunities for companies, supporting their internationalization, increasing market knowledge and helping them to find partners, contacts and projects in China. The program set a goal to increase the participant companies' turnover and exports by 10% and create 300 new jobs. The program wanted to increase the cleantech sector's visibility in China, spread the Finnish know-how and discover the most important and potential areas for the Finnish companies to focus on.

The program provided access to seminars and exhibitions both in Finland and China and offered delegation trips, matchmaking and networking events organized in cooperation with Chinese actors. Some of these events were organized also in Finland. Companies had the possibility to enlarge their networks and meet potential buyers. Initially, the program was planned to last three years but the program ended after around 1.5 years. After that, the program changed its name to "Cleantech Finland in China" and clarified its focus. In 2018, it was divided into two separate programs (Winter Sports & Flex Energy in China). The Beautiful Beijing program collaborated with the Cleantech Finland program.

## ARCTIC MARITIME AND OFFSHORE FROM FINLAND

The Arctic Maritime and Offshore from Finland (2015–2017) supported Finnish companies that operated in shipbuilding, offshore, construction and maritime technologies and aimed at internationalizing their business. The program focused especially on building a network of Finnish companies to enable a joint offering. Around 400 Finnish companies participated in the program. Companies were different in size and from different fields as the objective of the program was to involve the whole value chain to boost the effectiveness of the internalization activities.

The program aimed at accelerating business in the maritime sector, increasing the visibility of Finnish maritime know-how and getting foreign investments in Finland. Additionally, the program's objective was to find suitable international maritime projects for Finnish companies and to offer Finnish maritime know-how to international shipyards. Target markets of the program were Germany, Norway, France, Russia, China, the USA and Japan. The program closely collaborated with the Finnish Marine Industries and the program and its targets and activities were planned with them.

The program offered various types of services and events for the participant companies. The program provided networking and cooperation possibilities for companies making it possible to approach markets in larger company groups. Companies received advice and information on internationalization and market opportunities. The program identified relevant customers for the participants and participated in international fairs, seminars and conferences. Additionally, the program offered buyer meetings, business delegation and promotion visits as well as visits e.g. to shipyards.

# 2 METHODOLOGICAL APPROACH

## 2.1 CONCEPTUAL APPROACH

In addition to typical impact evaluation tasks such as identifying program results, added value and impact, this evaluation had thematic focus with the aim to identify the role of programs in advancing national strategies in relevant areas. The thematic emphasis refers to the deeper understanding of the role of these programs in the wider national context of several simultaneous strategies and policies. The evaluation also explored program contribution to sustainability and made suggestions on how the impact on sustainability could be improved.

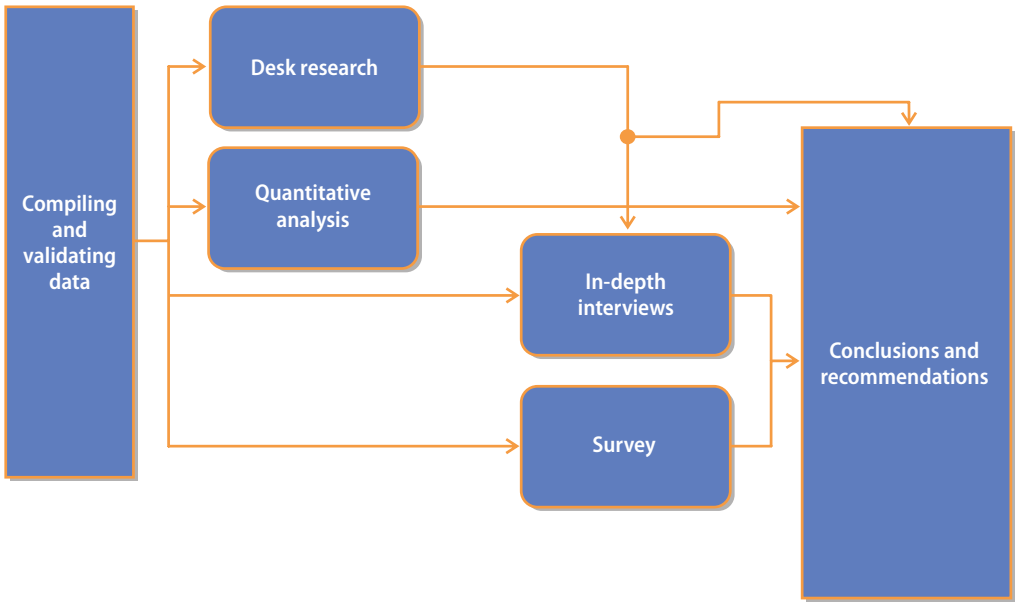
The methodologies described briefly below and in the Annex 1: Detailed methodology were designed specifically to address the common challenges faced in traditional program evaluation, while at the same time relying on the strong existing international evaluation best practices. Effort was made to collect and analyse data that could inform about the perceptions of the value of the programs as well as actual economic impact. To provide a good data input for the analysis consultation with program managers was conducted early in the process to gain access to relevant data.

The importance of program services has become increasingly prominent after the merger of export promotion activities (mostly non-financial services) and project funding. Thus, we aimed to identify beneficiary perceptions of the value of program services.

## 2.2 METHODS USED

Evaluation methodology is summarized in the Figure 2 below. As illustrated in the figure, the evaluation started with data compilation and validation. Company level data provided by Business Finland was used to conduct a quantitative analysis and to detect economic impacts of the programs. Survey was conducted to analyse beneficiary perceptions of the added value of the programs. That was supported with in-depth interviews with beneficiaries to better understand program impact mechanisms. Policy makers and program managers were interviewed to analyse the contribution to policy objectives. In parallel desk research of supplied program documents as well as

FIGURE 2. Overview of evaluation methods.




policy strategies was performed to gain understanding of contribution to national strategies and to provide general background information for the whole evaluation. Each method is briefly introduced below and more detail is available in the Annex 1: Detailed methodology.

**Desk research** focused on national strategies, documentation related to evaluated programs and publicly available information about beneficiaries. It provided general background information for the evaluation. Documentation on evaluated programs was collected from program managers. It provided general insight in policy context and operation of the programs as well as was used to draft the list of services available for program participants. Analysis of national strategies and program documentation helped to understand the alignment between the two.

A **quantitative analysis** was carried out with the aim to detect and compare the extent of impacts of the different programs and various company characteristics on key economic performance indicators of participating companies. Business Finland provided program and company data. In addition, public economic data at (sub)sectoral level were obtained from Statistics Finland. The performance of approximately 850 beneficiaries in terms of changes in turnover, value added, and export were analysed in conjunction with program participation information.

The **survey of beneficiaries** was performed to understand perceptions on the program impact and trends in use of program services. Web-based survey was sent to companies participating in evaluated programs and follow-up telephone survey was performed to increase the response rate[1]. The survey included questions on servic-

[1] The target was set to reach at least 20% response rate. In total 173 companies responded to the survey.

es, changes in project plan and contribution of programs as well as sustainability aspects of the programs.

To gain more detailed understanding of program results, impacts, impact mechanisms, value of services and synergies, **in-depth interviews** with selected beneficiaries were performed. Program managers were consulted to select the most appropriate candidates for interviews. In total 20 beneficiaries were interviewed representing all evaluated programs. All program managers[2] and selected policy makers were interviewed to analyse program governance, policy context and expectations and actual contribution to policy objectives.

## 2.3 LIMITATIONS

This evaluation combines several methodologies to analyse the programs. For some methods problems related to data were faced. A massive amount of documentary input had to be reviewed (roughly 1,900 documents) for the desk research. The total number of potentially relevant national policy documents is relatively large. Documents were included considering the relevance for this analysis, recognising the limitations of the project scope.

Despite the effort to increase the survey response rate with the help of a telephone survey, for some Finpro programs it still was not possible to collect sufficient and statistically relevant feedback. The relatively long time lag between the end of the programs and the evaluation was the main reason for reduced response rates. Also, there seems to be some confusion among beneficiaries and they are not always able to recognize the programs and distinguish them from other Business Finland (or former Tekes and Finpro) activities. Beneficiaries of Finpro programs sometimes take part in only one or a few program events and might not attribute the events to the program or might not consider one event as relevant. Measures were taken to increase the representativeness of the survey thus providing a more reliable picture.

An overarching limitation is connected to the framing of the study as defined in the terms of reference and in the project plan. An implicit assumption is that the services embodied by the programs to be evaluated only need to be compared to a no-use option of the targeted companies, sectors and emerging eco-systems, as comparable alternatives for the Business Finland services are – supposedly – of minor significance. The annual budget of Business Finland is indeed truly substantial, but over the course of the study it became evident that *in aggregate* the volume of all other options is significant as well, and is most probably growing.

[2] In some programs program managers changed during the implementation of the programs. For these programs program managers who were in this role for the longer period or were in this role when the program was closed were interviewed.

Other options do not provide exactly the same service portfolio as Business Finland does, but primarily complementary, yet also partly overlapping, services. These other options include services and funding provided by other public actors, such as EU programs H2020, Interreg and LIFE+; the Finnish Strategic Research Council (SRC); cities and provinces; the export credit and guarantee agency (FINNVERA); private actors, such as venture funds, and banks (commercial and the Nordic Investment Bank); and last but not least large partnerships such as Climate-KIC Nordic and SLUSH. These other options altogether amount to an approximate annual magnitude of 400 million euro. In addition, there exists a large public procurement market among EU Members States with enhanced sustainability and resilience criteria. Even just Finnish public procurement amounts to €35 billion per year (https://vm.fi/hankinta-suomi). All in all, companies in Finland do have a choice of alternative pathways for acquiring external financial and expertise support both consecutively and simultaneously to further their innovation and export ambitions, which can, but does not always have to include services from Business Finland.

There are also several limitations related to the data used. A more elaborate explanation of these is provided in Annex 1: Detailed methodology and Annex 3 Results of quantitative analysis. These limitations do not only imply larger uncertainties, but also constrict the attainable level of explanation of the quantitative analysis. Concerning the firms participating in one or more of the evaluated programs economic key data for the period 2010–2019 were collected with the aid of Business Finland. For a significant minority of the participating companies data are only available for a few years, only for some variables or both. The files containing the participating companies in Finpro programs offer very limited additional information at firm level, whereas additional background information per program is mostly not connectable to characteristics or performance of individual firms. The corresponding files for the Tekes programs contain more information on the participating firms. In order to have data for comparison, additional data were collected from Statistics Finland at subsector level. The nature of the data nevertheless appeared to imply quite significant restrictions on applicable methods.

# 3 FUNCTIONING AND GOVERNANCE OF THE PROGRAMS

## 3.1 ALIGNMENT BETWEEN THE PROGRAMS AND ALIGNMENT WITH NATIONAL STRATEGIES

The evaluated programs were thematically aligned and relevant for the national policy objectives and in that sense together comprised a mix of instruments that targeted various areas of bioeconomy and cleantech development. In general, the programs were also well aligned in terms of the relevance of the areas covered and timing of program introduction considering global market developments and demand for sustainable solutions.

By design **Tekes and Finpro programs** had clear division of labour in a sense that the former contributed to innovation and creation of new solutions while the latter aimed at growth in international markets. In some cases this synergy was envisioned in program design, e.g. Finpro's Innovative Bioproducts growth program was launched in order to support companies' entry to market after developing solutions with the help of BioNetsprogram.

Another example is Tekes program Arctic Seas and Finpro program Arctic Maritime and Offshore from Finland. Both programs were implemented simultaneously, and both aimed at supporting the Finnish maritime industry through difficult times. The Arctic Seas program focused on technology development, and the Maritime and Offshore from Finland on international marketing of the Finnish maritime cluster. Programs helped the marine sector to better anticipate the opportunities and consequences of climate change and climate policy, with special reference to Arctic shipping and passenger ships. Both focal topic areas face complications in order to fit into sustainable climate neutrality principles, whereas initial high expectations on Arctic shipping volumes moderated appreciably when scenarios started to adequately account for the economics of global logistics (e.g. Perrels et al 2020). Moreover, the programs actively targeted also offshore fossil fuel production which can be argued to be in contrast to the sustainability objectives (see more discussion on this in section 4.4. Contribution to sustainability).

Much further alignment was not achieved. According to the interviews with program managers the different working cultures between Tekes and Finpro programs was referred to as likely reason for limited collaboration.

The division of labour between **Tekes programs** was clear in the sense that BioNets aimed at developing new solutions and biomaterial ecosystems, whereas CleanWeb focused on supporting SMEs to enter and grow in international markets. Arctic Seas was based on the national Arctic strategy and aimed to promote creation of new businesses in eco-efficient marine solutions and sustainable use of marine resources. At the same time, as explained before there was also a need to support the maritime sector which was facing serious challenges. Last but not least Arctic Seas constituted background support for the Finnish chairmanship of the Arctic Council. The division of labour **between Finpro programs** was mainly based on the industry sectors and target foreign markets.

Insights accumulating during the operation of a program can lead to the **creation of other programs**. Cleantech Finland created a spin-off program covered by this evaluation - Beautiful Beijing program. The Beautiful Beijing program was set up to help promote the Cleantech Finland brand in China, and the Cleantech Finland program was involved in its planning. Cleantech Finland has also prepared the ground for new sectoral programs in the bioeconomy and circular economy. These sectors were an important part of the Cleantech Finland program, which created an actor network as well as understanding on the importance of these sectors. The Beautiful Beijing program selected energy (in conjunction with air quality) as one of the main topics in the co-operation between Finland and China. The co-operation continues, for example in the form of the current Business Finland Smart Energy program. Another focus area was winter sports, which has created the Finnish winter sports cluster with visibility in the Beijing Winter Olympics.

## 3.2 FUNCTIONING OF THE PROGRAM SERVICES

In general, according to the surveyed beneficiaries the services have been relevant and effective and companies are satisfied with the services. In this section the focus is on the functioning of program services and potential improvements suggested by program managers and beneficiaries. Specific added value of program services is presented in section 4.5. Added value of program services.

In some programs (e.g. Maritime, Offshore, Waste to Energy and Bioenergy, Beautiful Beijing) the survey of beneficiaries and in-depth interviews point to the need to provide more **focused services** targeting specific companies. Open participation in services (especially in the case of events) is not always optimal.

*"The challenge is that the field efforts should be more focused, but with open participation there will always be many types and sizes of companies offering a mixed variety of services. Perhaps separated efforts?"*

*"Often the programs just get overloaded and we find that we are in a webinar/ meeting to fight against other Finnish companies which I personally dislike a lot. BF has a key role to find new business models/approach to foreign markets – maybe the method of doing it will be finetuned in coming years."*

Answers of the beneficiaries
to the open question of the survey

As illustrated in the quote below, some in-depth interviews revealed the same. As perceived by beneficiaries, it seems that programs need to find balance between company networking and targeted efforts in finding new customers, because there is some evidence that beneficiaries could potentially benefit more if other approach was used.

*"It's good that different sectors and industries are involved in the programs as they might find out that they could do something together. However, when we are abroad and presenting our products to the potential investors and clients, the problem is how we can create a coherent story when one is talking about cancer drugs, the second about acoustic boards and third about how to replace plastic bags. Targeting and focusing is important. Either by making more targeted programs or by distributing a larger program by industry. This could help the companies to get more exact information and services that better serve an individual company."*

Quote from in-depth interview with beneficiary
of Innovative Bioproducts program

Some beneficiaries pointed that there were too many events, trips or activities within a short time span (e.g. Wood from Finland, Arctic Maritime and Offshore from Finland). They would have preferred fewer activities but with higher quality.

Beneficiary interviews reveal that growth program services should distinguish between experienced exporters and those who only start to enter foreign markets. This adds to the previous point and indicates a need for considering more targeted service offering. This is not an observation of program beneficiaries only. Program managers of growth programs have pointed to the particular success of activities that involve limited numbers of similar companies. Thus, there seems to be a common lesson learned at least in some of the programs - to achieve best results the services need to be sector and company size specific as well as consider maturity of the beneficiaries. This is further supported by comments

from beneficiaries who have pointed to overwhelming number of events which indicates that more targeted and fewer events would have been a better option.

Another issue emphasized by both program managers and beneficiaries is that for growth programs **the long-term perspective in target markets** is crucial for success and it is not always maintained with program activities (see beneficiary comment below). For the events organized abroad it was expected from some beneficiaries (Beautiful Beijing and Arctic Maritime and Offshore from Finland) that more time would be available for individual and direct meetings with potential clients.

> *"The problem with this kind of programs is that they are too short i.e. just that they start to produce results then financing ends. And in countries like China, perseverance and long personal relations are a must to have success. And this was also the problem of "Beautiful Beijing"*
>
> Beneficiary comment to open question of survey (Beautiful Beijing program)

Program managers have commented that **commitment of the companies is important** and it has not always been evident for all companies in all programs. Participation fee has increased commitment, but on the other hand it increased also the management workload. Participation fee or the amount of it was also mentioned in some of the survey answers as a factor preventing from participation in services. It was also pointed by beneficiaries that membership fee should have been adjusted based on company size acknowledging higher impact on program.

> *"We did not like that the pricing of the program was the same for bigger and smaller companies. Although bigger companies had much more effect on program strategy."*
>
> Beneficiary comment to open question of survey (Wood from Finland program)

For Tekes programs the funding element was considered the most relevant benefit and services are mostly seen as complementary benefit, but do not have a central role. Although the overall mix of services seems to be appropriate, there is also evidence that **some types of services were not offered** but would have helped the companies. For example, support for commercialization would be welcome as well as some training for pitching. The lack of support for commercialization after product development is a deficiency frequently identified in the Finnish technology support system[3]. When it comes to pitching,

[3] For example: Van Breugel, C., Sand, H., Adenfelt, M., Engström, D., Stavlöv, U., Berninger, K., Mehammer, B.S. ja Møller, K. Locomotive business: How can large companies be the catalyst for SMEs in exporting cleantech? TemaNord 532/2015. 103 s.

many cleantech actors have a research background, and they don't have experience in pitching. Thus, there is room for improving the service mix.

In terms of **ecosystem development as a specific service**, it was concluded that orchestration funding (first tested in BioNets program) has been successful and since has been regularly used in other ecosystem initiatives. Two-year orchestration can only work for ecosystems where the key actors are already networked and have prior collaboration experience. Furthermore, the orchestrator should have its own strong and long-term interest in the ecosystem and its development.

## 3.3 CHALLENGES IN PROGRAM GOVERNANCE

In general, the programs were governed and implemented in a manner that allowed to meet the objectives defined for the programs. Ecosystem development and program support for that is one of the examples of program success, BioNets in particular. However, evaluation identified three challenges in program governance that might have prevented from achieving the objectives better. First, the way changes in original program plans were made and coordinated, second, insufficient human resources and third, lack of monitoring mechanisms for sustainability impacts. All are elaborated below.

Desk research and interviews reveal that some programs made significant **changes to original plans**. For example, Beautiful Beijing started as a program to provide solutions to pollution, but later digressed to include winter sports. Beyond most likely not delivering significant sustainability benefits, the sidestep to sports raises questions about the strategic focus of the program. The program was not able to demonstrate immediate results in the difficult Chinese market and changed focus to winter sports despite potentially being successful in long term and having more good results in cleantech business support. Cleantech Finland program changed its focus from marketing to business promotion and new services were added. The focus in the Arctic Seas program shifted strongly from capturing the economic potential of the Arctic dimension into facilitating the development and recovery of the maritime sector.

Another example is Maritime and Offshore from Finland. Finpro had applied for funding for the program in late May 2016. Only five months later it submitted a revised application asking for major changes both in the quantity of the funding as well as how it was allocated. The Ministry submitted its decision in mid-November when less than 1.5 months of the financial year was left.

Some programs underwent major structural changes. For instance, what started as a sawmill export program first morphed into Wood from Finland and later continued under Finpro Bio-Cleantech theme Team Finland programs. Similarly Waste to Energy and Bioenergy was later merged into Smart Energy. The underlying process of

merging Tekes and Finpro probably contributed further to the complexity.

While changes may be justified, they are not always properly elaborated in documentation. The process for making significant and strategic changes is unclear, including if and how the program steering group has been involved and whether the Business Finland board has had a role to play. For some of the programs steering groups were discontinued mid-program. Interviews with policy makers confirm the above and reveal problems in considering and following-up steering group feedback. Interviews reveal that there is a communication gap between the ministries[4] and the Business Finland programs. The ministries feel that they do not get timely information on the progressor results of the programs.

According to program managers, **human resources allocated for managing of the innovation programs** as well as the support from the Business Finland management were not sufficient. Based on document review, it seems that changes in program personnel are rather a rule than exception. Beneficiaries have pointed to the fact that it is very important who is running the program: how active and competent the person is and how well the person knows the field and networks. In addition to that, program personnel are relevant for the delivery of good quality services especially in case demanding program objectives, for example ecosystem development, are defined. This might be difficult to achieve with insufficient resources and regular personnel change.

As is discussed in more detail in section 4.4. Contribution to sustainability, programs thematically addressed sustainability issues well, but nevertheless there were **no specific sustainability objectives nor a system to monitor sustainability effects**. The progress monitoring covers economic impacts, but it does not include sustainability related indicators.

[4] Policy makers from the Ministry of Economic Affairs and Employment, Ministry of the Environment and Ministry of Agriculture and Forestry were interviewed.

# 4 CONTRIBUTION OF THE PROGRAMS

## 4.1 RESULTS REPORTED FOR THE INNOVATION PROGRAMS

This section presents results self-reported by the beneficiaries of innovation programs. Data presented in this section is based on project end-reporting data provided by the beneficiaries. End-reporting data was systematically collected only for the innovation programs. Evidence on results generated by growth programs is presented in following sections and is based on beneficiary survey, interviews and quantitative analysis.

Beneficiaries of the three innovation programs (Arctic Seas, CleanWeb and BioNets) are reporting various results achieved because of the participation in the program. These results and effects are captured in the form of quantified results, which stem from the companies' own assessment and reporting.

As regards output engendered (see Figure 3), the programs contributed to **creating innovations**. A total of 146 patents created in the projects were generated across all three programs, complemented by 157 innovative energy and environmental services and 200 innovative energy and environmental products. Differences can naturally be noted between the respective programs, where the CleanWeb and BioNets programs have reported considerably greater output than the Arctic Seas program despite this program having a slightly higher number of projects (Arctic Seas n=78; CleanWeb n=77; BioNets n=62).

Zooming in on the type of innovation that has resulted from program participation, Figure 4 clearly shows that **new technologies** that were taken into use have been introduced by companies across all three programs, with an average of 58% of companies having checked this category. Particularly those companies that participated in the Arctic Seas program have pursued new technologies and their usage (63% of companies). An impact on the respective company's strategy, on the other hand, was registered considerably less frequently, with on average 17% of the companies reporting such an effect. Especially those that participated in the BioNets program experienced less impact in this regard (11% of companies). As overall positive feature merits to be mentioned that only

FIGURE 3. Number of outputs stemming from program participation. Source: Beneficiaries self-reported end reporting data provided by Business Finland

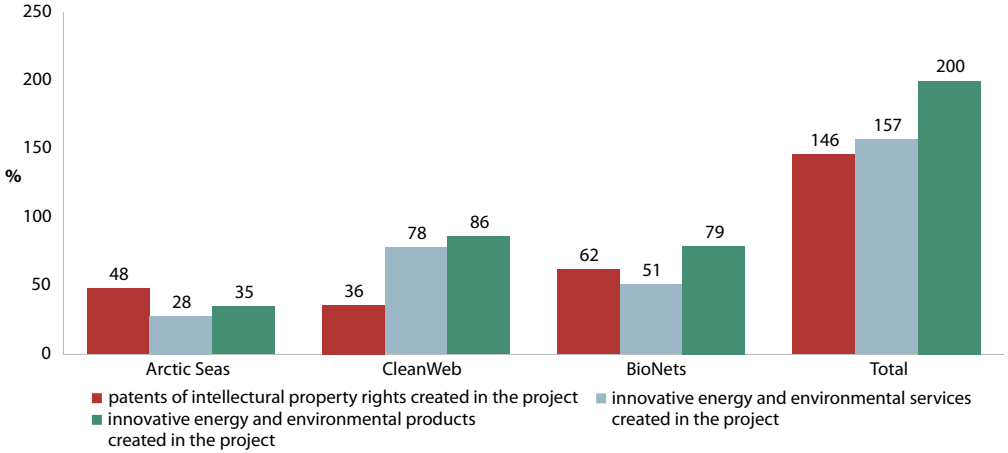
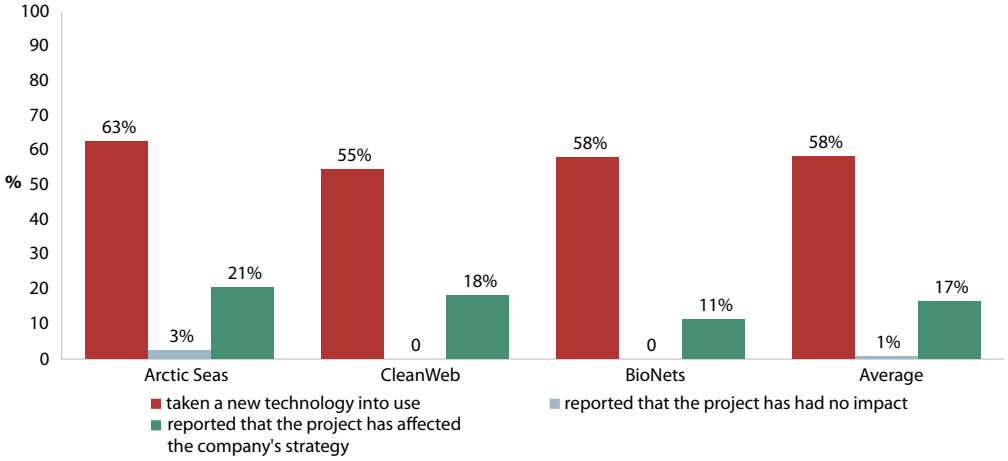



FIGURE 4. Share of companies that have introduced a new innovation, by type. Source: Beneficiaries self-reported end reporting data provided by Business Finland

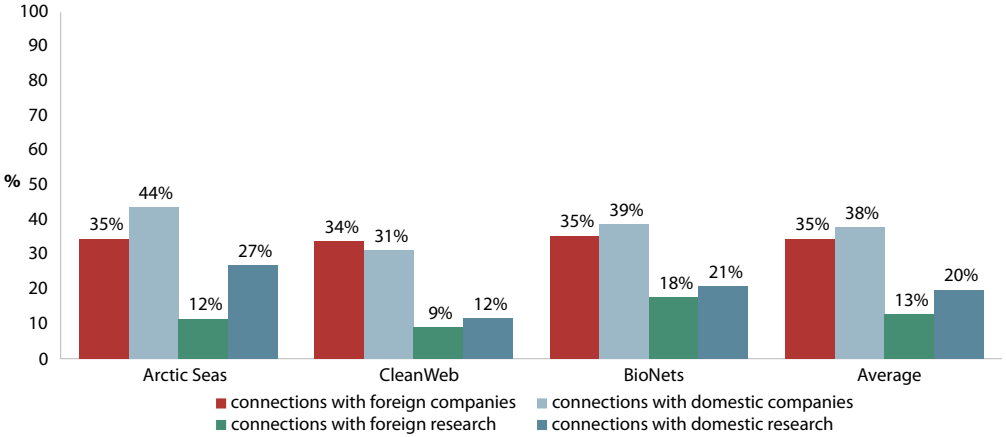



two companies (in the Arctic Seas program) across all programs considered did not report any impacts resulting from their participation.

A major intended effect of the presented programs has been to **foster cooperation** and develop a denser network among and between companies and research institutes, which ought to benefit the respective companies as well as the entire surrounding ecosystem, alike. Figure 5 clearly shows that most new connections were established with other companies, where the difference between foreign (38%) and domestic (35%) companies is rather marginal. Connections with foreign research, on the other hand, were sought considerably less frequently, with foreign institutes having been approached less (13% on average) as compared to domestic ones (20%). This difference is particularly apparent in the companies that participated in the Arctic Seas program, where links to domestic research (27%) were considerably more commonly established than to their foreign counterparts (12%).

Elaborating on the **innovation outcomes** stemming from program participation touched upon in Figure 6, one can see that new technologies or basic know-how with multiple potential applications was pointed at as a most common benefit arising from participation. Interestingly, participants in the CleanWeb program reported to experience this benefit less frequently than their counterparts in other programs. Instead, new products or ap-

FIGURE 5. Share of companies' established external relations, by type. Source: Beneficiaries self-reported end reporting data provided by Business Finland

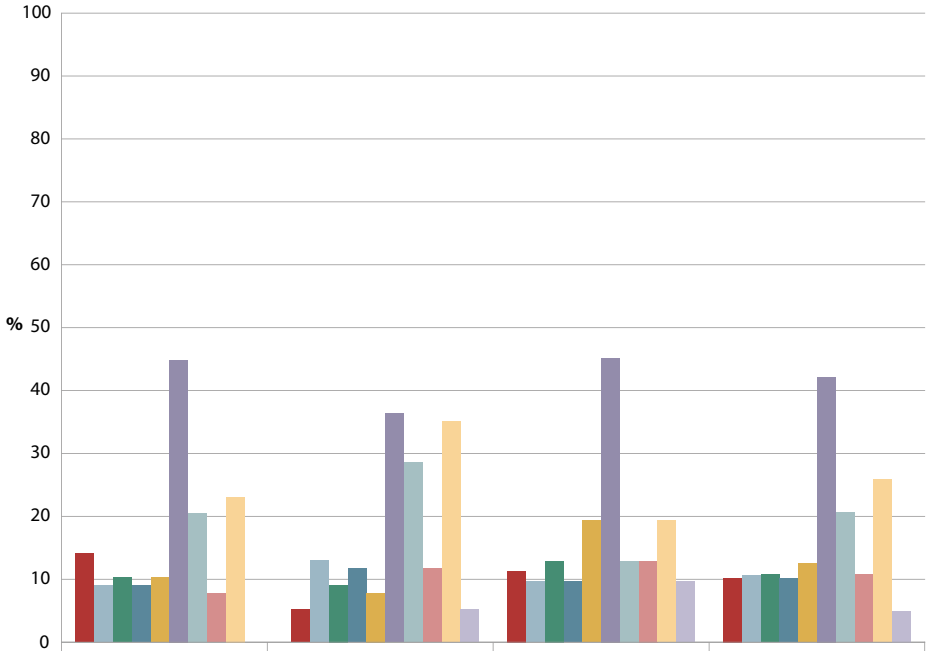



plications as well as new business concepts were proportionately more distinctively represented in the Cleanweb vis-à-vis the Arctic Seas and BioNets program, which is in line with the profiling of the Cleanweb program. Yet, all three categories are most commonly pointed at by companies across all the programs. On the other end of the spectrum, new processes have only been scarcely introduced, with no more than 5% of all companies claiming to have done so, and even none of those having participated in the Artic Seas program.

Mostly positive sentiments can be identified in terms of perceived impact on the companies' **market position**. In fact, almost half of all companies across all three programs registered a considerable improvement of their market position. Particularly CleanWeb participants express substantial satisfaction. On the other hand, about 10% of all companies did not perceive any impact on their market positions. This group of companies is biggest within the Arctic Seas program (17%). It should be noted that these self-reported results tend to suggest somewhat better outcomes than is found on the basis of companies' cumulative development of turnover as reported in section 4.3. Economic impact (Figure 12 and Figure 13).

Lastly, participating companies can be analysed for their perceived impact on their **competitiveness** thanks to program participation. The majority of companies indicated that their competitiveness has been boosted considerably as a result of participating in one of the three programs (61%). Once more, those companies having participated in the CleanWeb program are most positively tuned (77% indicating that their competitiveness has improved considerably). No impact on competitiveness, on the other hand, was noticed in only 3% of all companies, with the discontent being most visible amongst those companies that participated in the Arctic Seas program.

FIGURE 6. Share of companies' innovative introductions, by type. Source: Beneficiaries self-reported end reporting data provided by Business Finland




| | Arctic Seas | CleanWeb | BioNets | Average |
|---|---|---|---|---|
| co-operation berween public and private sector | 14% | 5% | 11% | 10% |
| improved service | 9% | 13% | 10% | 11% |
| improved process | 10% | 9% | 13% | 11% |
| improved product | 9% | 12% | 10% | 10% |
| pilot product or pilot facility | 10% | 8% | 19% | 12% |
| technology or basic know-how with multiple potential applications | 45% | 36% | 45% | 42% |
| new business concept | 21% | 29% | 13% | 21% |
| new service | 8% | 12% | 13% | 11% |
| new product or application | 23% | 35% | 19% | 26% |
| new process | 0 | 5% | 10% | 5% |

FIGURE 7. Share of companies' perceived impact on their market position. Source: Beneficiaries self-reported end reporting data provided by Business Finland

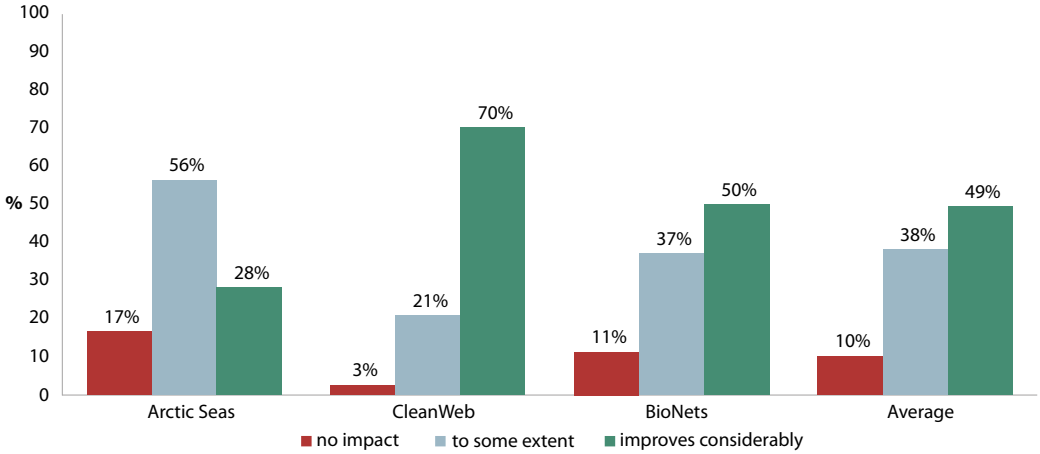
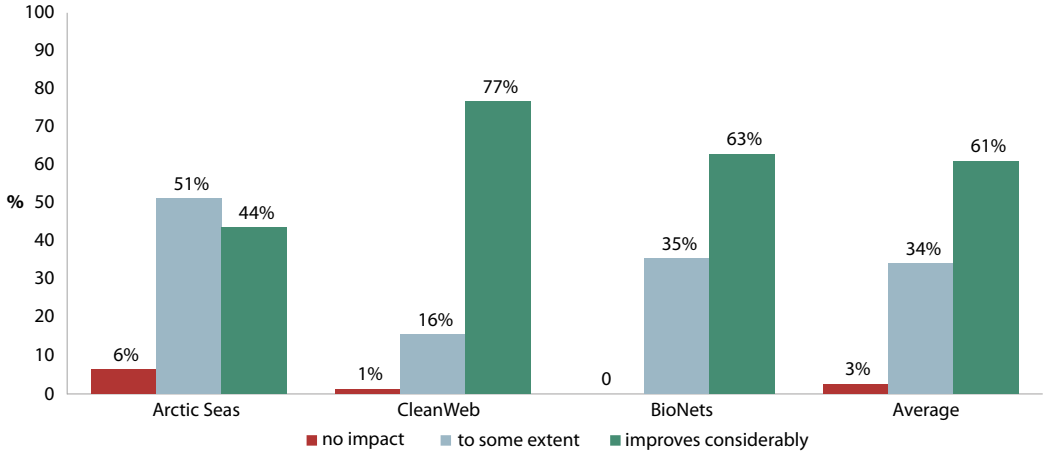



FIGURE 8. Share of companies' perceived impact on their competitiveness. Source: Beneficiaries self-reported end reporting data provided by Business Finland



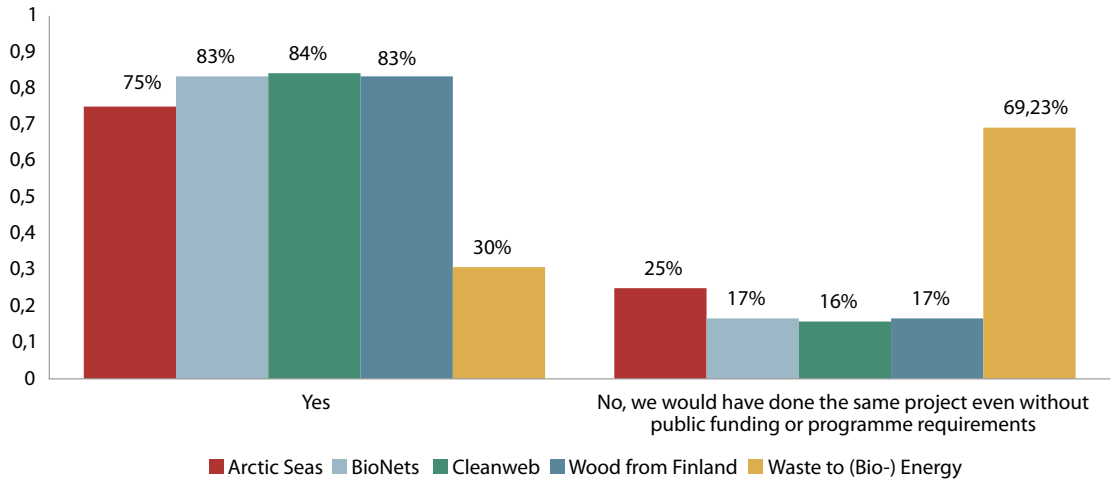
## 4.2 RELEVANCE, INCENTIVE EFFECT AND ADDED VALUE OF THE PROGRAMS

There is evidence (though not absolute) of the positive incentive effect created by the programs. Beneficiaries of the evaluated programs point at implementation of projects that would not have happened without program funding or support and requirements. The thematic relevance of innovation and growth programs was also praised by the participants.

The following figures present findings from the survey[5] of program beneficiaries and some extra detail is added based on the in-depth interviews with selected beneficiaries. Surveys of Maritime and Offshore program, Innovative Bioproducts program, Cleantech Finland and Beautiful Beijing program had insufficient response rates and thus are not presented.

As evident in Figure 9 below, survey results demonstrate that with one exception the programs had stimulus effect on the participants and projects would not have

FIGURE 9. Answers to survey question "Did you change your project plan because of the funding or program requirements?"[6] Source: Evaluation survey of program beneficiaries




5 Full survey results are presented in Annex 1.

6 Surveys of Maritime and offshore program, Innovative bioproducts program, Cleantech Finland and Beautiful Beijing program had insufficient response rate and thus here and further on are not presented.

been implemented or would have been implemented on a smaller scale or over longer period. Only for the Waste to Energy and Bioenergy program most respondents indicated that they would have implemented the same project even without participation in public program.

For some other programs evidence is less positive. Though the insufficient response rate of the survey is not fully representative, out of 33 Cleantech Finland program beneficiaries that have responded to the survey, only 29% indicated that program funding or requirements made positive changes compared to initial project plan. Similarly, only around third of 36 Maritime and Offshore program survey respondents pointed that program requirements adjusted the initial project plan and thus have incentive effect.

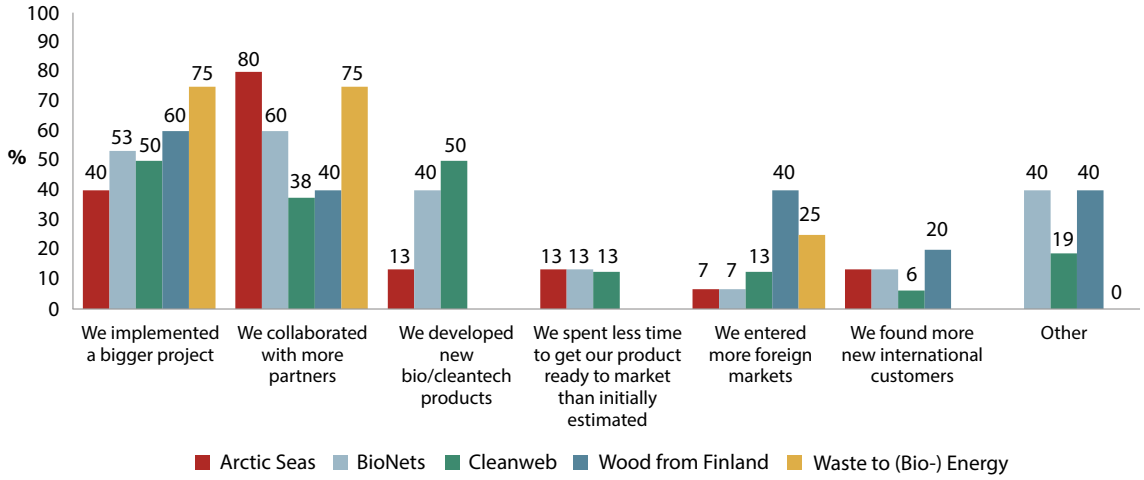
For some programs with insufficient survey response rate some evidence can be found in beneficiary feedback collected by the programs. For instance, 51% of Cleantech Finland program beneficiaries indicated that their business has benefited only a little or very little/not at all from the Cleantech Finland initiative[7]. However, this must be treated with caution because the data were collected after the first five years of program implementation and do not represent the whole program period.

When asked to explain how exactly the program funding or requirements has helped, beneficiaries most often point to the scale of project – the ability to implement a bigger project either in terms of budget or ambition, for example, targeted markets (see Figure 10 below). Another equally relevant benefit is the ability to collaborate with more partners. Partnerships with research institutions were often emphasized as relevant in innovation programs as well as business partnerships both in local and foreign markets. Development of new products has been relevant for the beneficiaries of innovation programs and this corresponds to the objectives defined for these programs. The implied success rates regarding entering new markets and finding new customers have the same order of magnitude as found in the international literature regarding effects of export promotion (Makioka 2019; Srhoj et al 2020).

Acknowledging specific program objectives, growth programs have helped more in entering foreign markets while have not been relevant in developing new products. It seems that programs did not have very significant impact on the time spent to get the product to the market. This might be explained by difficult target markets selected for the programs as well as potential technological intensity of the products or services supported by the programs. In general, it was more challenging for beneficiaries of growth programs to attribute positive develop-

[7] Program documentation provided by Business Finland.

FIGURE 10. Answers to survey question "How did your project plan change?" (multiple choice question).
Source: Evaluation survey of program beneficiaries




ments to the programs. For example, a beneficiary of the Innovative Bioproducts said:

> *"If we have been in a fair with Finpro in Japan and we meet a potential buyer or investor, it can take years before something actually happens. Thus, I cannot give credit to the program for the successful outcome even though the program may have helped to get the first contact."*

From the responses to open questions can be inferred that the most important other (not earlier discussed) benefit is the expanded effort for entering foreign markets. For innovation programs other benefits include improved or diversified products[8] and not just new project development. Considering the thematic focus of programs, this might be explained by potential sustainability improvements in already existing products or services.

[8] Note that survey answer options include introduction of new products, thus product improvement was indicated as other answer option in the text box.

Innovation programs were also relevant in a sense that they stimulated to consider extra new markets compared to the initial plan of the company. Possibility to work together with research institutions was often pointed as other benefit. Programs were instrumental also in helping to clarify project plan, objectives and business model. This illustrates good diversity of the program impacts.

Trends identified in the survey were further supported by evidence collected by in-depth interviews with selected beneficiaries. As illustrated in the quote below, program funding was relevant to increase the scale of the projects.

> *"Without the program and without such funding, we would not have been able to carry out the project at this stage. The program therefore had a major impact on the company's operations. Funding of this size category enables large development projects."*
>
> Quote from in-depth interview with Arctic Seas program beneficiary

## 4.3 ECONOMIC IMPACT

### METHODOLOGICAL CONSIDERATIONS

The quantitative analysis aims to assess whether participation in the programs made a difference for the participating companies in terms of key indicators such as turnover, value added, and exports, and to what extent these effects differ between the programs. As indicated earlier a part of these effects will probably occur later, i.e. after 2019 (the last year for which we could include company-level observations). From the dataset related to the Tekes programs, it can be inferred that many participating companies expect that stimulus effects of innovations developed in the projects occur with significant time lags, stretching up to six years after the end of the program.

Out of necessity the analysis focuses on effects on growth of the participating firms only. However, in the case of innovations and export led growth of production there will also be mostly positive spill-over effects to other companies, either benefitting from increased supplies to the participating company or benefitting from the innovations of the participating firms.

Based on the prevailing research on the inclination of firms and their chances for success regarding initiating or expanding exports, a set of assumptions can be made (Shroj et al 2020; Makioka 2019), including:

- Smaller firms are more likely to benefit from these services than larger firms, due to the partial fixed cost character of export activity (including the engagement with new export markets)
- Companies that are already exporting, but may want to expand the number of markets, may be selective regarding choice of export promotion ser-

vices, as expected benefits are often smaller
- Companies with moderate to weak productivity may face higher failure risk when starting to export, as it may take time before the efforts and extra costs pay off
- Companies may improve program benefits, if they can subsequently or even partly simultaneously take part in innovation and export promotion programs, which address the same product domains

These notions hint at the need for selection or screening of interested participants, either in relation to admission to a program or in relation to recommendations of which service elements to use. Indeed, Business Finland is to a varying extent applying such practices in the evaluated programs.

Different export promotion programs apply different recruitment and admission mechanisms, this may cause selection bias issues in the programs and the attribution of their effectiveness. Especially in those cases where voluntariness is combined with eligibility screening, the participating companies may have above-average capabilities compared to other non-participating companies from the same sector or cluster. Under such conditions a part of the above average performance observed is probably attributable to (non-observed) company characteristics instead of to the program participation only.

On the other hand, some programs of Business Finland, such as Maritime and Offshore and Wood from Finland, are not intended in the first place to enable Finnish firms to be in the forefront of new product developments and new market opportunities. Instead, they try to assist sectors to transform more thoroughly so as to reduce or even terminate dependence on stagnating and shrinking product-market segments or at least get decisively stronger positions in those market segments. For programs that include such orientation the observed company-level performance of participating companies may not stand out from non-participating companies, even if economic activity in new markets or products develops favourably. As the quantitative analysis is intentionally designed to use external verified performance data only (i.e. from Statistics Finland and by necessity at firm level), it is not possible to provide clear evidence from the quantitative analysis for all programs screened.

The assessment focuses on turnover and exports, even though value added is to some extent taken into account as well. New firms in particular may experience low or even negative value added in their early years. For this reason, turnover better reflects activity under those circumstances.

## MAIN RESULTS OF QUANTITATIVE ANALYSIS

Performance of the participating companies is compared by grouping them both by program and by sector. As the programs of Business Finland are particularly, but not exclusively, targeting small and medium sized firms (SME's), the performance of this segment is shown in addition to aggregate performance of all participating firms by program. The change in aggregate turnover of all Finnish firms in the period 2013–2019 was about 16%, and about 14% for industrial firms. National level turnover in 2016 was lower than in 2013 owing to the ongoing contraction in many sectors in 2014 and to a milder extent in 2015.

The performance of programs, when considering all firms, can be – loosely – compared with the national average for businesses. For SME's participating in the programs, performance in 2016 is much less characterized by the national dip, except to some extent in the Cleantech Finland program. In all Tekes programs and in the Innovative Bioproducts and Wood from Finland (Finpro) programs SME's are clearly performing better than the group averages. It is however fair to add that for the Innovative Bioproducts program the stark difference is entirely attributable to one large participating firm in a relatively small program. Another qualification is the difference in participation dynamics between the programs and the way this is reflected in the performance monitoring data. For example, in the cases of Cleanweb and Cleantech Finland some of the change is attributable to varying representation of firms in the reported performance of the different years.

One can observe large differences between programs, as can also be inferred from the program descriptions in section 1. Background and objectives. It should be realized that the Tekes innovation programs are not in the first place meant to boost company performance regarding turnover in the short run. The innovation efforts may even to some extent (initially) drain the resources for short term growth enhancement.

The groupings by sector are compared with the corresponding national sector figures of Statistics Finland.This provides a clearer basis for comparison than the program figures, especially because a detailed sector level is used, making firms more comparable. Furthermore, it avoids overlaps (several companies took part in various programs). Only sectors with sufficient representation in the programs (N10) are included.

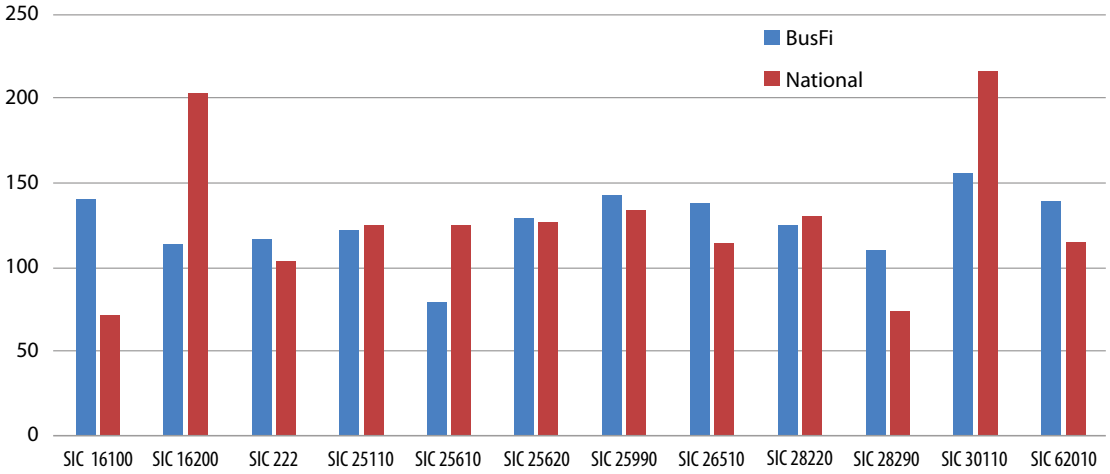
Figure 11 suggests rather mixed results. For sawmills (16100), measurement equipment (26510), 'other' machinery (28290), and software development (62010) the companies in the program seem to fare clearly better than the corresponding sector on average. Conversely, for wooden (construction) products (16200), metal processing (25610) and shipbuilding (30010) the opposite seems to be the case.

TABLE 2. Indexes for turnover development in 2016 and 2019 (2013=100) for all participating firms and small and medium sized^ firms (SME's) by program, and national level developments as reference.

| | | Volumein billion € in 2013 | 2016 | | 2019 | |
|---|---|---|---|---|---|---|
| | | | All | SMEs | All | SMEs |
| **National*** | **All firms** | **394** | **98.3** | **104.8** | **115.8** | **119.1** |
| | **All industrial firms** | **135** | **90.2** | | **113.6** | |
| **Tekes#** | Arctic Seas (2014-2017) | 6.7 | 96.6 | 148.5 | 105.3 | 146.8 |
| | Bionets (2016-2018) | 12.6 | 93.3 | 137.5 | 88.8 | 142.1 |
| | Cleanweb (2016-2018) | 2.2 | 141.8 | 136.2 | 192.8 | 230.5 |
| **Finpro#** | Beautiful Beijing (2013-2017) | 1.0 | 160.4 | 108.6 | 203.8 | 105.3 |
| | Cleantech Finland (2008-2019) | 27.0 | 76.8 | 85.5 | 92.2 | 86.7 |
| | Maritime & Offshore (2015-2017) | 11.7 | 103.0 | 106.2 | 110.0 | 111.3 |
| | Innovative bioproducts (2016-2018) | 0.3 | 88.5 | 234.4 | 33.0 | 410.0 |
| | W2E & Bionergy (2015-2017) | 1.7 | 167.9 | 133.9 | 228.3 | 115.0 |
| | Wood from Finland (2015-2018) | 1.4 | 114.2 | 124.6 | 129.9 | 135.6 |

*) source: Statistics Finland – Structural Business and Financial Statement statistics;
#) based on the data provided by Business Finland;
^) SME's are defined as firms with less than 250 people employed (Eurostat)

FIGURE 11. Development of turnover from 2013 (=100%) to 2019 by sector as represented in the programs compared to corresponding sector performance at national level.




16100 sawmills
16200 wooden products (e.g. building elements)
222 plastic products
25110 metal construction elements
25610 metal processing & coating
25620 metal working
25990 remaining metal products
26510 measurement & navigation equipment
28220 hoisting and conveyor systems
28290 other machinery (not in previous cat.)
30110 shipbuilding
62010 software development and production

In addition, the aggregate values for turnover and exports were assessed for 2013 and 2019 (see Table 3). It should be recognized that the collection of active companies in 2013 is not exactly the same as in 2019, but nevertheless the figures give a reasonable impression of the net changes between 2013 and 2019. The growth in turnover of the entire collection of participating firms is clearly less than for all companies in Finland as shown in Table 2. In contrast the development for the participating SMEs is much closer to the national growth between 2013 and 2019. For export development the contrast between SMEs and the entire group of participating firms is even larger. The overall share of SME's in the overall group of participating firms is about 90%, with some variation over the programmes. Yet, SME's share in the involved turnover hovers around 15%.

TABLE 3. Key economic indicators for the aggregate of the participating firms in all evaluated programs (in billion EUR).

| | Aggregate turnover | | Aggregate exports | |
|---|---|---|---|---|
| | All | SME | All | SME |
| **2013** | 47.0 | 7.0 | 25.5 | 2.9 |
| **2019** | 47.9 | 8.2 | 24.6 | 3.4 |
| **%-change** | 1.7% | 16% | -3.3% | 16.5% |

The above figures give a first impression of relative performance, but do not actually assess to what extent differences are attributable to program efforts or company characteristics. As explained above the data used for performance per company (turnover and export) are realizations of recent year performance and therefore

by definition do not capture the future growth potential of innovations and export enhancement efforts. On the other hand, self-reported expectations are arguably not a good source for evaluating actual performance. A part of the stated expectations concerns years for which observations of realized turnover and exports are available. To this end, we compared expectations for specified years regarding new turnover based on product and service innovations funded by a Tekes program with realizations of entire firm turnover in the same years, for companies with eligible data. All in all, the analysis indicates that the expected turnover is not a good indicator for realized performance for the purpose of ex-post evaluation. The details are presented in Annex 4 Comparing realized and expected turnover.

## RESULTS BY PROGRAM

The significance of the program types (Finpro export promotion, Tekes innovation support, participation in both programs) with respect to company performance was first tested for the entire group of participating firms, supplemented with a small selection of non-participating firms (see Annex 3 for further explanation) in order to get an overall impression of the relative position of the key explanatory variables. Subsequently, program specific tests were also carried out for most programs. The Innovative Bioproducts program is too small for meaningful testing, whereas the Wood from Finland program, as a single sub-sector-oriented program, was shown indeed to have the desirable effects by simply comparing the participating companies with the entire sector.

The richer dataset for the Tekes programs enabled in fact two types of estimations: one with the same limited set of variables used in the estimations of the Finpro programs and another which uses additional variables from the Tekes program dataset, pertaining to program management information. In the first type non-participating companies can be included as a reference base. In the second type only the participating firms can be included, which means that those results tell more about the relative significance of company characteristics (and program management information) for success rather than about the overall effect of the programs.

The objective of the analysis is to examine the evidence that the cumulative growth of turnover and export from 2013[9] to 2019 is higher on average for companies which took part in one of more programs, as compared to those that did not participate at all. Arguably, when taking part in such focused efforts one could expect that on average among the participating firms one would find some stimulus effect. As explained in this chapter and

[9] Or a more recent year, if the company's data do not reach until 2013.

preceding ones, there are numerous other factors that could significantly affect growth. As the effects of the evaluated programs can be expected to be often relatively weak, it is important to capture major factors in the estimations and thereby reduce risks for vastly over- or under-attributing effects to program participation. A part of the used variables has a so-called dummy character, representing presence or absence of a certain condition, which makes the indicative value of parameters values rather coarse.

Therefore, Table 4 reports only the direction of the influence (enhancing or diminishing) and the statistical significance, with more detailed estimation results shown in Annex 3 Results of quantitative analysis. The annex contains a list of variables, including a brief explanation of their meaning and coverage, as well as the numerical results of the estimates. Here we focus on the summary table with its qualitative synthesis of the results.

In the applied estimations the variables of prime interest for the evaluation are the variables indicating

TABLE 4. Results for regression analyses including all participating companies.

| **Variable** | **Effect on cumulative growth rate in 2019** | **Statistical significance*** | |
|---|---|---|---|
| | | **Growth 2014 excluded** | **Growth 2014 included** |
| Young firms (firm age < 6 years) | Enhancing growth | marginally | strong |
| Growth in 2014 | Enhancing growth | | strong |
| In Finpro program (only) | Diminishing growth | insignificant | marginally |
| In Tekes program (only) | Diminishing growth | Highly insignificant | insignificant |
| In both Finpro + Tekes program(s) | Enhancing growth | Highly insignificant | marginally |
| Number of employed | Diminishing growth | quite | insignificant |
| N = 632, R2: ~0.02 (without 'growth in 2014'); N = 571, R2: ~0.12 (including 'growth in 2014') | | | |

*) The textual indications of statistical significance are based on the reported t-values (at 95% confidence levels) in the estimation results (see Annex 3; 'strong' means very significant; 'quite' to clearly beyond the significance threshold value; 'sufficient' to somewhat above threshold value; 'just' to being approx. on the threshold value; 'marginally' to under, but near to threshold value; 'insignificant' to well below the threshold value; 'highly insignificant' very low t-values (i.e. < 0.5))

whether a firm has been in at least one Finpro program, at least one Tekes program, and in both Tekes and Finpro programs. The other variables represent factors that tend to systematically increase or decrease the cumulative growth rate. It should be noted that the number of employed persons is largely to correct for scale differences. The larger the firm the harder it is to achieve very high growth rates.

The inclusion of the 'growth rate for 2014' makes a significant difference as it represents whether a firm started the program participation on an unfavourable footing[10].

The results presented in Table 4 appear at first to also suggest that participation in only one program was ineffective. However, given data and methodological limitations, the main finding suggested is rather that **more active firms combining the different elements of growth enhancement tend to fare better**. The current analysis cannot infer the causal direction of this relation. The more favourable growth effect of companies with combined program participation may be attributable to the participation, but the combined participation may also be a proxy for high ambitions of a firm, meaning that more ambitious firms achieve higher cumulative growth rates and – inter alia – are inclined to take part in more programs. Furthermore, as intended, young firms tend to benefit more than average (when measured as cumulative growth in percentage, rather than in aggregate volume of euros)[11].

A supplementary assessment looks at the distribution of the cumulative growth in turnover of firms which took part in the evaluated programs and compares it to the same type of distribution of firms which took part in other programs of Business Finland, applying a selection of sectors which are strongly represented among the participating firms of the evaluated programs. The comparison is shown in the Figure 12 below. On the left-hand side the distribution is shown for the firms in the evaluated programs. The percentage share of firms with shrinking turnover (cumulative growth rate < 1) is mentioned in both graphs. The percentage share of firms with a shrinking cumulative growth rate is appreciably larger for the evaluated programs (31% vs. 14%).

The results can also be compared with the biannual business barometer of the Finnish Association of Entrepreneurs (Suomen Yrittäjät), which includes indicators depicting the distribution of turnover expectations among companies. Depending on the phase in the business cycle the share of companies with contracting turn-

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10 The inclusion of that variable reduces the number of valid cases in the estimation, whereas there are also technical issues arising from using a lagged version of the dependent variable, even though the time lag is large in this case. Therefore, in table 4 we also present estimation results without that variable.

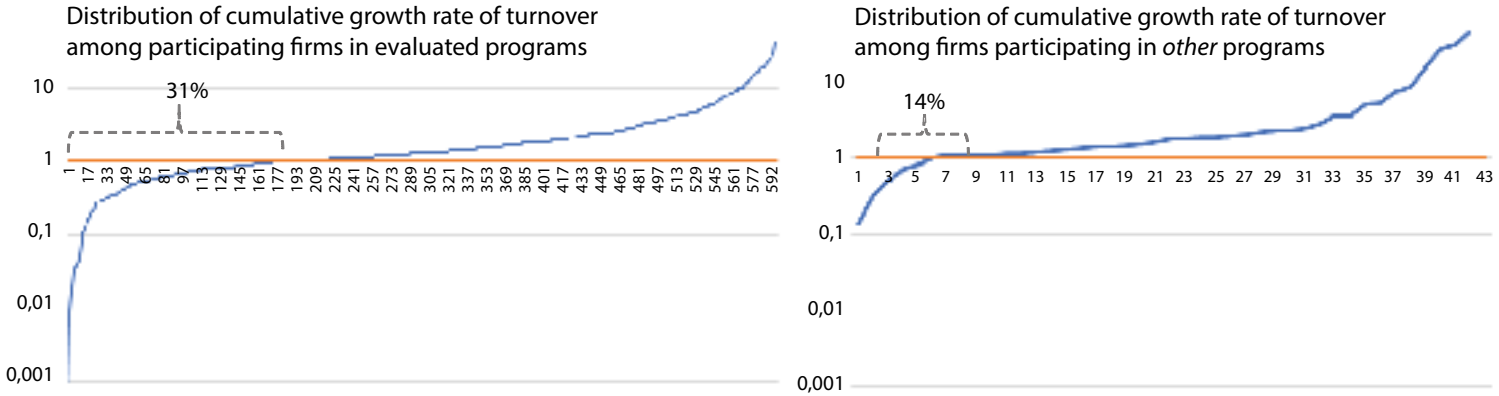
11 It should be noted that most of the variables are simple binary indicators, i.e. a certain characteristic applies (indicator = 1) or not (indicator = 0). In fact, only the number of employees of a firm (in 2013 or the first next year available) and 'growth rate in 2014' are continuous variables.

over prospects varies between 5% and 35%. The barometers published between fall 2018 and fall 2019 indicate rates of around 18%. In other words when considering the entire collection of firms which participated in the evaluated programs, the share with contracting turnover (31%) is evidently higher than the barometer scores of that time. In the next section distributions per program will be included.

These figures illustrate that the test for statistical significance applied above on the effect on turnover is very strict and likely excessive. In fact, one may expect that a part of the participating firms will not achieve the objectives. Depending on program intentions the fraction of less favoured firms may deviate from the overall average that can be expected. If the fraction of not so successful firms is substantial (i.e. over 30%), whereas other factors are of notable influence as well, it is possible that for various programs variables representing participation may turn out to not have a statistically significant effect. However, if a notable segment of the firms does achieve enhanced growth, even if many others do not, it is likely that the engendered benefits outweigh the program costs. On the other hand, neither the quantitative nor the qualitative assessments in this report can indicate precisely how significant the contribution of the programs has been for those companies with favourable outcomes.

The cumulative growth on the y-axis is shown in logarithmic scale. The x-axis shows the number of firms.

FIGURE 12. Distribution of cumulative growth rate of turnover among participating firms in evaluated programs and of firms participating in other programs of Business Finland.



## RESULTS FOR FINPRO PROGRAMS

Results are presented for the Finpro programs Cleantech Finland and Maritime and Offshore. For the programs Beautiful Beijing, W2E/Bioenergy, and Innovative Bioproducts no adequate estimation results could be produced, given the small sample sizes. Furthermore, given the strong sectoral focus of Wood from Finland, the sector comparison shown in figure 11 provides already sufficiently clear evidence, while no adequate counterfactual was available for estimates in this particular case.

In general, the status of young firms (company age < 6 years) and the company's growth in 2014 (at or before the beginning of program participation in most cases) have very significant influence on the cumulative growth rates. For a significant number of the participating firms 2014 has been not a very good year, and this explains to some extent that no stimulus effect is found in the cumulative growth rates of turnover or export. Interestingly, the results for impacts on exports on the Cleantech program indicates statistically significant effects of program participation. This is also the longest running program and therefore more likely to show engendered effects.

The contribution of program participation seems to vary across the two programs analyzed. The dominant significance of other variables, the notion of not yet observed growth due to lagging mechanisms, and the significant variation in success across firms within a program, leave little room for statistical significance of program participation, except for SMEs in the Maritime and Offshore program and for exports in the Cleantech program.

Company size (in terms of employees) mostly does not entail a significant difference in achieved growth rates. As explained earlier this is mainly due to the fact that it is harder in any case for larger companies to achieve high (cumulative) growth rates.

Both in the Cleantech Finland and in the Maritime and Offshore programs about 33% of the participating firms experienced a contraction in cumulative turnover between 2013 and 2019. In the case of Cleantech Finland this figure reflects the large diversity of firms admitted to the program, while in the case of Maritime and Offshore the shipbuilding sector's transformation requirement is reflected in figure 13.

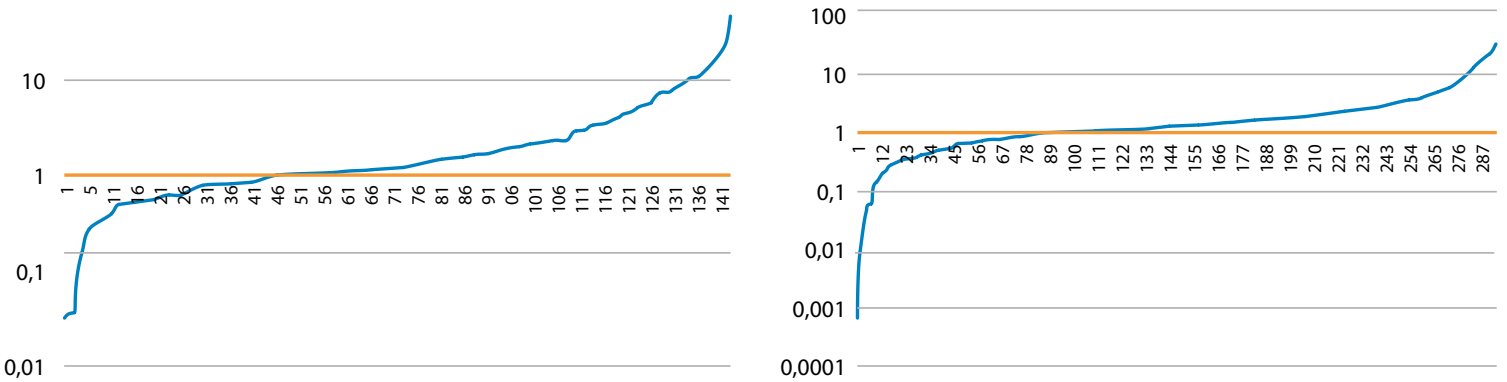
TABLE 5. Results for regression analysis by Finpro program (companies with eligible data).

| **Cleantech Finland** | | |
|---|---|---|
| **Turnover (N = 156); R2 = 0.19; F = 0.00002)** | | |
| **variable** | **effect** | **statistical significance** |
| In Finpro program (only) | Diminishing growth | insignificant |
| Growth in 2014 | Enhancing growth | strong |
| No export in base year | Enhancing growth | insignificant |
| In both Finpro + Tekes program(s) | Enhancing growth | insignificant |
| Young firms (< 6 years) | Enhancing growth | strong |
| Number of employees | Diminishing growth | insignificant |
| **Export (N = 136; R2 = 0.07; F = 0.04)** | | |
| **variable** | **effect** | **statistical significance** |
| In both Finpro + Tekes program(s) | Enhancing growth | quite |
| In several Finpro programs | Diminishing growth | just |
| Young firms (< 6 years) | Diminishing growth | insignificant |
| Number of employees | Diminishing growth | highly insignificant |

*) The textual indications of statistical significance are based on the reported t-values (at 95% confidence levels) in the estimation results (see Annex 3; 'strong' means very significant; 'quite' to clearly beyond the significance threshold value; 'sufficient' to somewhat above threshold value; 'just' to being approx. on the threshold value; 'marginally' to under, but near to threshold value; 'insignificant' to well below the threshold value; 'highly insignificant' very low t-values (i.e. < 0.5))

| **Maritime & Offshore** | | |
|---|---|---|
| **Turnover (N = 300; R2 = 0.14; F = 0)** | | |
| **variable** | **effect** | **statistical significance** |
| In Finpro program (only) | Diminishing growth | marginally |
| Growth in 2014 | Enhancing growth | strong |
| No export in base year | Diminishing growth | insignificant |
| In both Finpro + Tekes program(s) | Diminishing growth | highly insignificant |
| Young firms (< 6 years) | Enhancing growth | quite |
| Number of employees | Diminishing growth | insignificant |
| **Turnover SMEs (staff < 250) (N = 279; R2 = 0.11; F = 0)** | | |
| **variable** | **effect** | **statistical significance** |
| In Finpro program (only) | Diminishing growth | insignificant |
| Growth in 2014 | Enhancing growth | strong |
| No export in base year | Diminishing growth | insignificant |
| In both Finpro + Tekes program(s) | Enhancing growth | quite |
| Young firms (< 6 years) | Enhancing growth | quite |
| Number of employees | Diminishing growth | insignificant |
| **Export (N = 257; R2 = 0.04; F = 0.08)** | | |
| **variable** | **effect** | **statistical significance** |
| No export in base year | Diminishing growth | quite |
| Young firms (< 6 years) | Enhancing growth | marginally |
| In both Finpro + Tekes program(s) | Enhancing growth | insignificant |
| In several Finpro | Diminishing growth | insignificant |
| Number of employees | Diminishing growth | highly insignificant |

FIGURE 13. Distribution of cumulative growth rate of turnover among participating firms in Cleantech Finland (left) and Maritime and Offshore (right).




## RESULTS FOR TEKES PROGRAMS

In the Tekes programs the status of young firms (young) company tends to be even more important for favourable outcomes in terms of growth in turnover and exports than in the Finpro programs. Indirectly, this functions also as indicator for the effect of profiling of the Business Finland programs being in the first place meant for young firms and SME's (which are significantly overlapping firm characteristics). This finding also confirms the message from Table 2, regarding the stronger growth experienced by SMEs in the evaluated programs, as compared to all firms. For a significant portion of the participating firms 2014 was not a very good year, and this explains to some extent that no stimulus effect is found in the cumulative growth rates in turnover or exports. The absence of export performance before program participation started has a similar influence on the results, but this effect is less prevalent across the board.

The fact that the positive, but often not significant, effect of participation in both Tekes and Finpro programs is accompanied by a negative, but neither significant, effect of another participation indicator, must be understood in relative terms. The participation in both types of programs is an indication of the usefulness for supporting innovation efforts with market expansion efforts and vice versa, entering new markets may have higher chances of success if supported by (target market relevant) innovations. Participation in both types of programs could also be an indicator of a relatively ambitious company culture and hence a tendency to achieve more volume growth.

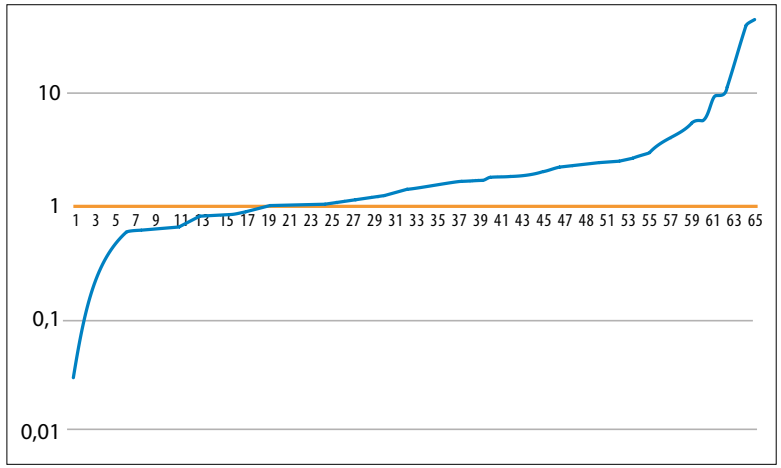
TABLE 6. Results for regression analysis by Tekes program (companies with eligible data).

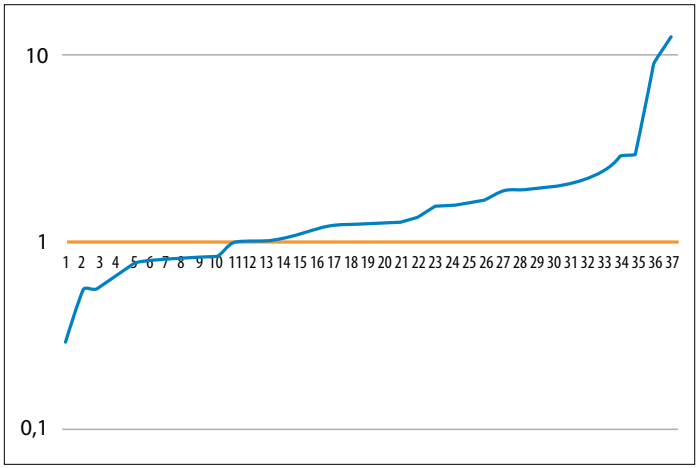
| **Bionets** | | |
|---|---|---|
| **Turnover (N = 71; R2 = 0.18; F = 0.02)** | | |
| **variable** | **effect** | **statistical significance** |
| No export in base year | Diminishing growth | quite |
| In several Tekes | Enhancing growth | entirely insignificant |
| Young firms (< 6 years) | Enhancing growth | strong |
| In both Finpro + Tekes program | Diminishing growth | insignificant |
| Number of employees | Diminishing growth | insignificant |
| **Arctic Seas** | | |
| **Turnover (N = 85; R2 = 0.2; F = 0.002)** | | |
| **variable** | **effect** | **statistical significance** |
| Growth in 2014 | Enhancing growth | strong |
| In several Tekes | Diminishing growth | entirely insignificant |
| Young firms (< 6 years) | Enhancing growth | marginally |
| In both Finpro + Tekes program | Enhancing growth | entirely insignificant |
| Number of employees | Diminishing growth | marginally |
| **Export (N = 67; R2 = 0.22; F = 0.004)** | | |
| **variable** | **effect** | **statistical significance** |
| In several Tekes | Diminishing growth | entirely insignificant |
| Young firms (< 6 years) | Enhancing growth | quite |
| In both Finpro + Tekes program | Enhancing growth | insignificant |
| Number of employees | Diminishing growth | sufficient |

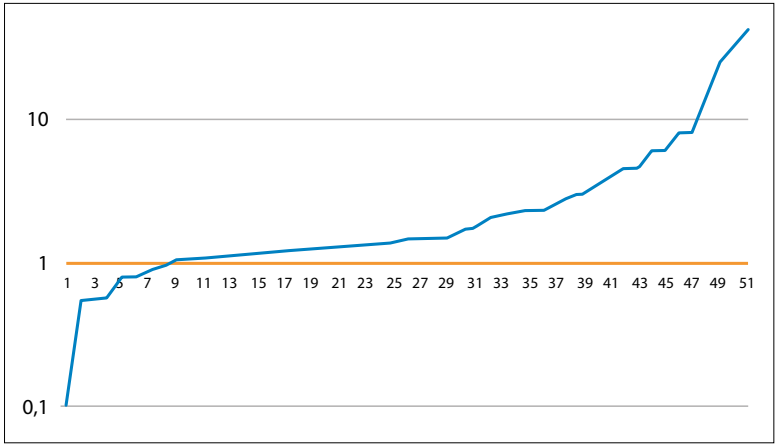
| **Cleanweb** | | |
|---|---|---|
| **Turnover (N = 74; R2 = 0.32; F = 0.0** | | |
| **variable** | **effect** | **statistical significance** |
| Growth in 2014 | Enhancing growth | insignificant |
| In several Tekes | Diminishing growth | insignificant |
| Young firms (< 6 years) | Enhancing growth | strong |
| In both Finpro + Tekes program | Enhancing growth | insignificant |
| Number of employees | Enhancing growth | insignificant |
| **Export (N = 42; R2 = 0.16; F = 0.17)** | | |
| **variable** | **effect** | **statistical significance** |
| In several Tekes | Diminishing growth | insignificant |
| Young firms (< 6 years) | Enhancing growth | strong |
| In both Finpro + Tekes program | Enhancing growth | sufficient |
| Number of employees | Diminishing growth | insignificant |

*) The textual indications of statistical significance are based on the reported t-values (at 95% confidence levels) in the estimation results (see Annex 3; 'strong' means very significant; 'quite' to clearly beyond the significance threshold value; 'sufficient' to somewhat above threshold value; 'just' to being approx. on the threshold value; 'marginally' to under, but near to threshold value; 'insignificant' to well below the threshold value)

FIGURE 14. Distribution of cumulative growth rate of turnover among participating firms in the Tekes programs Arctic Seas (upper left), Bionets (upper right), and Cleanweb.



In other estimations (see Annex 3 Results of quantitative analysis), information generated from participation in the Tekes program was also assessed with regards to possible differences in outcomes. This information includes regional location of the firm (or of its statutory main headquarters, in case of multi-location firms), and several risk indicators used during the application phase to evaluate the expected prospects for innovation success by the company. Inclusion of these variables meant that no outside comparison firms could be included. The different risk classifications applied during the evaluation of project proposals seem to have some signalling relevance with respect to expected innovation success in terms of activity growth of the company.

It should be noted that the Bionets and Arctic Seas programs were also motivated for sector transformational reasons, and hence it was harder to achieve high cumulative growth rates across the board. The shares of firms with contracting growth (see Figure 14) are somewhat smaller than those found for companies participating in the Finpro programs, and amount to about 30% for the Arctic seas and Bionets programs and about 15% for the Cleanweb program. This finding concurs with the idea that the Cleanweb program was most explicitly geared towards market expansion, with particular emphasis on SME's.

## 4.4 CONTRIBUTION TO SUSTAINABILITY

The evaluated programs had a specific focus on sustainability, albeit from different perspectives. The evaluation tried to establish what results and impacts have been achieved in this respect.

The rationale behind several programs relies on sustainability megatrends such as climate change and resource scarcity. Sustainability also played a central role in the narrative of most of the programs. In many programs sustainability was integrated into thematic and sectoral priorities – and for Cleantech Finland it is arguably the very foundation. It is also clear that many of the supported activities help directly in addressing global sustainability challenges. This is evident in areas such as energy efficiency, air quality and nutrient recycling.

However, sustainability is often simply assumed on the merits of the sector or segment alone. For instance, cleantech and bioeconomy solutions and companies are implied to be sustainable by definition, without closer inspection, reasoning or criteria. This brushes aside the critical discussion around for example climate and biodiversity challenges related to the growing use of forest biomass or concerns about rare metals in electrification.

Some programs have also supported sectors with high sustainability risks without adequately addressing them.

This is particularly evident in the way Arctic Seas and Maritime and Offshore Finland targeted the offshore sector (i.e. oil and gas exploration and production at sea). Other segments of concern highlighted by the programs include Arctic subsea mining, peat fibres as a material and furs. In the rare occasion sustainability risks were explicitly addressed, they were seen as relatively minor issues which may be addressed with communications, rather than substantive changes.

Program objectives had a focus on economic outcomes in terms of growth and restructuring. Innovation programs objectives were mainly related to inputs (funds allocated, number of projects supported, etc.) and economic impacts (turnover, exports) and/or ecosystem characteristics (number of participating companies, networks established).

Some programs had specific sustainability-related selection criteria or program-level indicators. In Cleantech Finland addressing environmental challenges was defined as one membership criterion for companies, concrete environmental impacts were mentioned as part of criteria and there were references to assessing and demonstrating impacts. Moreover, the criteria explicitly recognised reducing environmental impacts and risks. Even though there was no specification provided for rating such risks, at least sustainability was raised to the level of operational action. However, project selection using environmental impact criteria was not without its challenges. Some interviewed companies criticised the program for supporting some companies that they did not consider sustainable.

For Cleanweb someprogram level indicators were defined for environmental sustainability,but the focus in monitoring was on inputs and economic impacts. Environmental sustainability was identified as important and considered during project selection, but it was hardly ever used as a deciding criterion. The Wood from Finland, Maritime and Offshore and Cleantech Finland programs used environmental arguments in marketing Finnish products, for example certified wood and green shipping.

By and large the programs did not have clear goals, priorities or key performance indicators related to sustainability. Program documentation does not clarify what kind of sustainability criteria, if any, was applied in the programs.

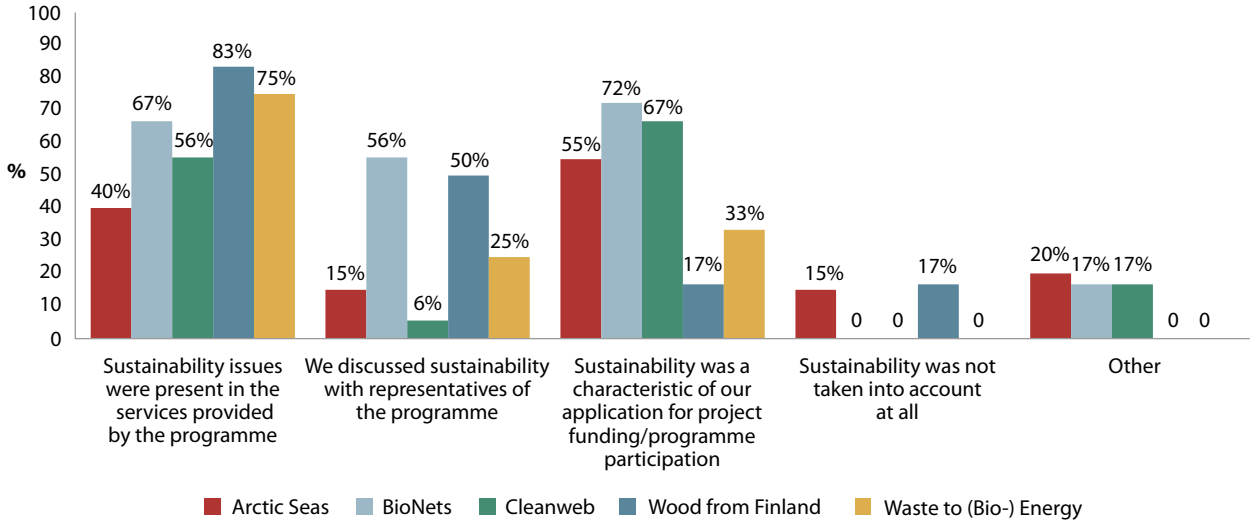
This finding is supported by an earlier evaluation of Tekes programs by the National Audit Office of Finland[12]. The evaluation recommended already in 2011 that Tekes should estimate emissions, energy saving and renewable energy in its programs. In its response, Tekes argued that it has developed the ex-post reporting of environmental

[12] Tuloksellisuustarkastuskertomus 227/2011: Energia- ja ilmastoteknologian tukeminen.

impacts, including on energy efficiency, recycling, renewable energy use and air quality[13]. However, the documentation does not suggest this would apply to the analysed programs.

According to the judgement of program beneficiaries, sustainability issues were present in the services provided by the program (Figure 15 below). Beneficiary comments most often point to thematic focus of services as relevant for addressing sustainability. In-depth interviews clarified that in some cases services were targeted at sustainable technologies and in that way were relevant for sustainability. For innovation programs sustainability was a characteristic of companies' application for program participation indicating that programs were successful in attracting projects with strong sustainability component and thus very likely contributed to sustainability. This was less evident in growth programs probably because they did not focus on product development.

FIGURE 15. Answers to survey question "How were issues concerning sustainability taken into account in your interaction with the program" (multiple choice question). Source: Evaluation survey of program beneficiaries




[13] Jälkiseurantaraportti: Tuloksellisuustarkastuskertomus 227/2011: Energia- ja ilmastoteknologian tukeminen.

Beneficiaries pointed to other ways sustainability was present in the programs. Response to EU legislation and other international standards is a topic reflected by beneficiaries and indicates that the program helped to address this external development (see beneficiary comment below).

> *"The project supported us in developing a product that meets new international standards of environmental impact. Alternative fuels is the future and in our understanding that was the whole Bionets idea to support projects that aim to develop alternative materials, fuels and so on."*
>
> Beneficiary comment to open question of survey (Bionets program)

As a general benefit collaboration with research institutions was mentioned as relevant in achieving sustainability goals of projects. For innovation programs ecosystems were relevant in acknowledging sustainability aspects (see quote from beneficiary below).

> *"Digitalization in the marine sector can improve sustainability aspects, for example, decrease environmental footprint. This is what the program supported ecosystem was about."*
>
> Beneficiary comment to open question of survey (Arctic Seas program)

Considering the evidence from the survey as well as program thematic focus and design, evaluated programs **presumably had positive sustainability impacts** (as developed products, services and solutions have potential to improve sustainability). However, estimating these impacts is not possible due to lack of monitoring and the fact that practically all these impacts are indirect and depend entirely on the adoption of the developed products, services and solutions by the clients of the participating companies and what earlier products, services and solutions they may replace. The **awareness of environmental sustainability**, circular economy, etc. and especially what opportunities they can offer in international markets seems to have increased.

## 4.5 ADDED VALUE OF PROGRAM SERVICES

Innovation programs provided both funding and services whereas export promotion programs provided only services. Examples of innovation program services include thematic events and seminars, assistance with attracting EU funding and support for ecosystems (orchestration, roadmap development, etc.). Cleanweb had a focus on market entry services. Typical services of growth programs were B2B seminars, exhibitions, business delegation trips abroad and to Finland, meetings with buyers in Finland, targeted training, marketing in target markets, market research and similar.

Detailed survey results indicating most valued services in each program, as well as specification of the benefits these services provided, are presented in Annex 2 Survey results. For innovation programs benefits varied between programs and specific services provided. For Arctic Seas program thematic events were relevant in finding new collaboration partners and all services were relevant also for product development. In Arctic Seas events focusing on digitalization helped most in product development.

Cleanweb program services were more relevant for finding new collaboration partners and developing products, while out of the wide range of internationalization services only selected services targeting foreign markets were relevant for entering these markets[14]. In this respect delegation trips are most valued.

According to the survey, Bionets services focusing on ecosystems have been most helpful in project planning and solving project problems, but service contribution to product development is less relevant. Interviews reveal that ecosystem orchestration works best for companies that have already been to some extent networked. There is also some evidence that not all ecosystem members benefit from the ecosystem or value the operations of ecosystem due to limited understanding of the ecosystem objectives.

A trend observed across innovation programs is that beneficiaries most value the funding received from programs. Although extra services are valued, in-depth interviews as well as open survey responses point that funding is most relevant. This is understandable since as discussed before, funding provided in innovation programs helps companies develop larger and more ambitious projects. Yet, other results of the evaluation (interviews, survey responses, quantitative analysis) seem to suggest that the implied potential for project budget expansion may not correlate so strongly with better economic performance later on.

Among the beneficiaries of growth programs delegation trips, exhibitions as well as branding of country are repeatedly reported as relevant for entering foreign markets. According to the survey and in-depth interviews, the value of delegation trips that involve government institutions was pointed as especially relevant in countries were building strong and trusted relationships is valued (e.g. China). It helped to strengthen credibility and open doors to this market. Also, companies that were already present at the target markets, said that the presence of Finpro or Tekes increased their credibility.

[14] Although survey response rate for this program was sufficient, it might be that participants of some services were not part of the respondents.

In all growth programs beneficiaries point that services have been relevant for finding partners which most likely implies that foreign trade markets have been identified with the help of program services. In-depth interviews with Beautiful Beijing and Wood from Finland beneficiaries point to value of common stands in trade fairs. These were useful since Finnish companies are small and in China it would be difficult to have visibility alone.

> *"The advantage that Finpro had in China was that usually customers were members of an association (furniture manufacturers' associations, etc.), and they are somehow state-related. Thanks to the people of Finpro and the embassy, we were able to get in touch with those associations and during almost every trip we visited an association, which increased the awareness of Finnish sawn timber in China and helped to find customers."*
>
> Quote from in-depth interview with beneficiary (Wood from Finland program)

Interviewees from the Waste to Energy and Bioenergy highlighted the visit to Vietnam in 2016 as an excellent example of a successful and well organized and planned trip. Companies met relevant organizations, it opened new business opportunities and changed companies' plans. The trip even changed attitudes towards such trips:

> *"For a long time, I was skeptical towards any export promotion trips but visit to Vietnam changed this. During the trip, it was clear that companies were listened, and they have had an opportunity to influence what kind of services or events were provided."*
>
> Quote from in-depth interview with beneficiary (Waste to Energy and Bioenergy program)

When beneficiaries indicated that they had not used some of the services, the most common reasons for that were either lack of awareness that the service was available or irrelevance of the service for the company. Since programs offered several services this finding should be interpreted with care and does not indicate irrelevance of some services, because most likely companies chose offering that was the most appropriate. However, indication that information about some services was missing should be taken into account in future programs.

Beneficiaries were asked about general satisfaction with program services. Most interviewees said that information on services was well communicated and they did learn about the services on time. Many interviewees said that they had an active contact person from Finpro or Tekes, so they were also directly contacted when there were suitable services for them. Many interviewees emphasized the importance of activeness and competence of the personnel who are running programs. Some said

that the active contact person or the leader of the program was the most important reason why the participation in the program was so successful.

Beneficiaries of both innovation and growth programs agree with the statement that participation in the services was easy and non-bureaucratic. Only for Cleanweb there was slightly higher share of beneficiaries who pointed that they neither agree nor disagree with this statement. This might be explained with slightly different services (more targeting foreign markets) provided in this program.

Beneficiaries were also asked to indicate whether services met their needs. Most beneficiaries of innovation program Cleanweb as well as beneficiaries of growth programs stated that their needs were met. For innovation programs Arctic Seas and Bionets there was an equal share of respondents who pointed that they neither agree nor disagree with this statement thus indicating slightly less convincing benefit from services.

In terms of service quality growth programs were assessed as having high quality, although most beneficiaries of Waste to Energy and Bioenergy pointed that they can neither agree nor disagree with this statement. Service quality was also appreciated by beneficiaries of innovation programs. Arctic Seas was the only where most beneficiaries pointed that they can neither agree nor disagree with this statement.

For some programs with insufficient survey response rate some evidence on satisfaction with services can be found in beneficiary feedback collected by the programs. Based on this material, most participants in events organized by Beautiful Beijing were satisfied with the events and would recommend the program to other companies[15]. Internal survey of Maritime and Offshore beneficiaries is very much in line with the survey results of this evaluation. As with other growth programs, also for Maritime and Offshore beneficiaries most value the contribution of services in finding new partners which is followed by contribution to market entrance.

[15] Program documentation provided by Business Finland.

## 4.6 EXAMPLES OF SUCCESSFUL PROJECTS

Program's results, contribution and specific impact mechanisms can be observed based on examples of successful projects. Some successful cases across programs are presented below.

### AEROMON / ARCTIC SEAS

Aeromon is a company providing emission monitoring as a service. Aeromon participated in Tekes program Arctic Seas as a part of the HyperGlobal project that aimed at establishing innovative and cost-effective solutions for monitoring maritime emissions. Aeromon was established in 2015 and this project was the first development activity for the company. Thus, Arctic Seas provided a unique opportunity to a new company to develop a new monitoring system and build their first prototype. The project enabled Aeromon to collaborate with the top specialists from the Technical Research Centre of Finland (VTT) and the Finnish Meteorological Institute (FMI). Moreover, Aeromon received an access to the national reference laboratories to test and validate their monitoring system's performance. Currently, the product is ready and the company's business is based on the developed solution. Besides the maritime sector, the monitoring system is also used in other fields. ■

### BOLDAN / CLEANWEB

Boldan is a company providing service concept for pipe renovation. Boldan uses cured-in-place method to repair existing pipelines meaning that there's no need for excavation and digging up the existing pipes. Boldan participated in Tekes program Cleanweb with an aim to internationalize their business and to understand the local corporate culture in USA. As part of the program the company attended the LACI incubator in Los Angeles to receive training and sparring on how to enter the US market. Services provided by the program and the incubator were highly useful as the customs in USA differs a lot from the Finnish way of doing business. As a result, Boldan increased their understanding of the US market and established an office in Florida. Networking opportunities were also appreciated and knowhow of the Boldan's technology has distributed in the US. ■

## SOILFOOD / BIONETS

Soilfood is a company that uses side-streams to produce recycled fertilizers. Soilfood was established in 2015 and they participated in the Bionets program's nutrient recycling ecosystem in 2018. Soilfood received funding to develop a recycled liquid fertilizer and the project enabled Soilfood, for example, to research and develop the product, examine the export potential and carry out field tests. Field tests and piloting were especially important as it is challenging to sell a new product without them. Some farmers were also involved in the piloting process and they are still Soilfood's customers. Before the program, the product wasn't commercialized and there had only been some small experiments with concentrated liquid fertilizer. Nowadays, the developed product represents a significant proportion of Soilfood's business. Additionally, in 2019, Soilfood launched a new product with higher added value that was also piloted in the project. ■

## ICEBREAKER BROCHURE / MARITIME AND OFFSHORE

Arctic Maritime and Offshore from Finland aimed at networking and cooperating among companies and approaching market in larger company units. An excellent example of this cluster thinking is a brochure called "Finnish solutions for the entire icebreaking value chain". The icebreaker brochure presents several Finnish companies and organizations covering the whole value chain from research to maintenance. Another version of the brochure was also produced targeting the US market. Two participant companies of the program were interviewed and both mentioned the brochure and were highly satisfied with the outcome. Brochure was seen as successful investment where several operators were brought together. ■

## GREENSTREAM / BEAUTIFUL BEIJING

GreenStream Network Ltd is an investor and investment management company that focuses on energy efficiency and climate finance. GreenStream participated in the Beautiful Beijing program. Even though the company's target area is China and they had already been on the Chinese market for years, they benefited from the program. During the program the company, in addition to expanding its energy efficiency project portfolio in China, started a new initiative targeting Chinese schools and daycares. The intention was to have a pilot school to showcase Finnish solutions, for example solutions improving the quality of indoor air, and to make the school environment more comfortable. These projects were large and promising, and they negotiated with different parties for several years. Although the energy efficiency business expanded successfully, the school project unfortunately, in the end, was not realized as there was no further funding from the Finnish side. ■

## JPJ-WOOD / WOOD FROM FINLAND

JPJ-Wood is a family-owned sawmill with over 25 years of experience in producing sawn and timber. JPJ-Wood took part in the Finpro's program Wood from Finland and was also involved in the planning of the program. The program helped the company to enter the Chinese market, get new contacts and better understand how the Chinese market works. Also, they learned more about competitors and what the products that Finnish companies should concentrate on are. Program's support was highly valuable as Finnish sawmill companies are too small to attend the Chinese trade fairs by themselves but together, companies are more visible. JPJ-Wood had some Chinese clients before the program, but during Wood from Finland they found more clients that are suitable for their products. JPJ-Wood is still exporting their products to China. ■

# 5 PROGRAMS AS TOOLS FOR ADVANCING NATIONAL STRATEGIES

Finland has a rich tradition of presenting policy priorities through national strategy documents. Strategies mostly frame their visions and priorities in the context of sustainable development, recognising economic, social and environmental goals. The analysed strategies do not explicitly refer to the Business Finland programs covered by this evaluation, except for the Maritime Strategy and the Arctic Seas program. However, most strategies include at least some references to Business Finland predecessors, most notably Tekes. More broadly strategies recognise the role of innovation and export support.

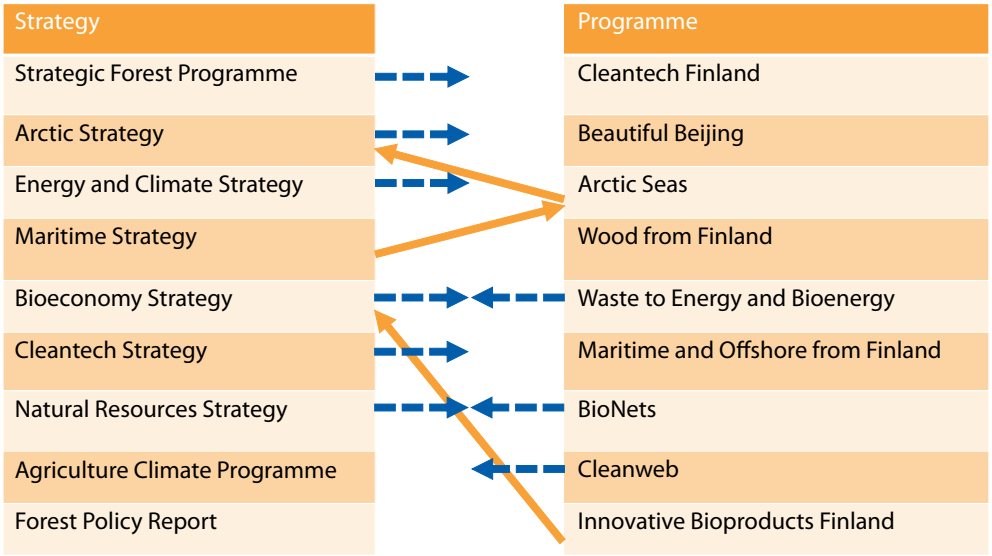
Similarly, out of the nine analysed programs, only two include explicit references to national strategies. The lack of recognition of policy documents is particularly striking in the case of programs which immediately followed national strategies on the same issues, such as Maritime and Offshore Finland (2015–17) launched after the Maritime Strategy (2014).

The main exception is Arctic Seas. Program documentation includes both direct quotes from and multiple references to the Arctic Strategy. Strategy priority areas are also explicitly recognised. The other exception is Innovative Bioproducts Finland which refers to the Bioeconomy Strategy.

Some other programs do recognise other government policies and documents. For example, BioNets and Cleanweb mention the Sipilä government spearhead projects (kärkihankkeet). The Cleantech Finland program prepared knowledge base for the Cleantech Strategy. It produced data on the Cleantech sector, which is not a category in the official Finnish statistics. Connections between strategies and evaluated programs are summarized in Figure 16 below.

Orange lines represent direct references in strategies to programs and vice versa. The dashed blue lines represent broader/indirect references in strategies to Busi-

FIGURE 16. Connections between strategies and evaluated programs.




ness Finland or in program documentation to government policy documents.

Several growth programs were more linked to sectoral competitiveness policies. Wood from Finland was based on the need to save Finnish sawmill industry by finding new markets in times when the regular markets were down. The work was carried out in cooperation with the Ministry of Economic Affairs and Employment.Maritime and Offshore Finland and Arctic Seaswas based on the Ministry working group on the competitiveness of maritime industry, the objective was to save Finnish maritime industry in difficult times.

Programs and strategies can be aligned even without an explicit reference in the documentation. At a very high level the themes and priorities of strategies and programs seem to align quite well as both emphasise sustainability. The central role of bioeconomy in national strategies is mirrored well in the focus areas of several programs. The Arctic Strategy is quite logically followed by Arctic Seas and the Maritime Strategy by Maritime and Offshore from Finland. This was confirmed in interviews with policy makers.

According to interviews with policy makers, innovation funding and export promotion have always been part of the implementation of climate and energy strategies, but their role has been strengthened lately. This is partially due to EU reporting commitment, where also research and innovation needs to be reported, and partially due to the strengthening of export promotion as a task of the Ministry of Economic Affairs and Employment energy department. Business Finland and its predecessors have been in a very central role in the implementation of the Bioeconomy Strategy. During the previous government, significant amount of funding was directed to bioeconomy and Tekes was at the centre of this through the government's key projects, and through Finpro support for export promotion. In the Bioeconomy Strategy innovation funding and export promotion play a central role. It

is partially due to EU Bioeconomy strategy being coordinated by DG Research, and thus R&D is very strong in the EU strategy.

The primary rationale of the programs was economic rather than cleantech or environmental.The mechanism for economic strategies (bioeconomy, Arctic) was direct, whereas for the clean and environmental strategies the impact was indirect, mainly through the adoption of the products, services and solution developed in these programs in most cases by the clients of the participating companies.

Strategies and programs tend to have different perspectives due to their very nature. Strategies are focused on solving societal challenges and achieving economic, social and environmental impact. Programs, on the other hand, mostly concentrate on delivering business outcomes such as sales, turnover and exports. Aligning the two better would probably require that the programs set more clearly defined goals also on the impacts and monitor them.

One structural way to ensure alignment between strategies and programs is to involve government representatives in program management. The programs have included ministries in their steering groups – at least until some of the groups were eventually disbanded. However, except for Beautiful Beijing, only the Ministry of Economic Affairs and Employment was involved.

# 6 CONCLUSIONS AND RECOMMENDATIONS

## 6.1 CONCLUSIONS ON PROGRAM GOVERNANCE AND SERVICES

As discussed in the report, programs were **timely, thematically relevant and somewhat aligned internally as well with national strategies**. Programs had a clear delineation of impact domains with distinct focus on innovation and growth and further narrowed by specific sectors as well as target markets. In addition to environmental sustainability thematic focus, several programs had a substantial adjacent role in supporting troubled sectors by transforming their product and market orientation as a means to enable their recovery. Some programs practiced new approaches (e.g. ecosystem orchestration in BioNets) and developed ground for new programs where the themes are continued.

However, the evaluation identified several **challenges in program governance** that may have made achievement of objectives more difficult. First, the way changes in original program plans were made and coordinated was not transparent and lacked full endorsement from all parties involved in program governance. This might have missed relevant strategic considerations. Previous evaluation evidence illustrates similar issues with other programs as well (Business Finland, 2019).

Second, securing sufficient human resources to manage the programs is reported as very relevant both by program beneficiaries and program managers. This has not been fully achieved and insufficient resources for management of programs have been reported. Finally, sustainability impacts of the programs cannot be estimated due to the lack of systemic monitoring mechanisms for these impacts.

In terms of program contribution to national strategies, the main conclusion is that **programs and strategies are relatively well aligned** though that is not always very evident or documented in specific program documentation. Programs and strategies can be aligned

even without an explicit reference in the documentation. Broadly speaking the themes and priorities of strategies and programs seem to align quite well as both emphasise sustainability. The central role of bioeconomy and cleantech in national strategies is mirrored well in the focus areas of several programs. At the same time, the prevailing rationale of the programs was economic rather than environmental. The mechanism for reaching economic objectives (bioeconomy, Arctic) was direct, whereas for the environmental strategies the impact was indirect, mainly through the adoption of the products, services and solution developed in these programs in most cases by the clients of the participating companies.

According to the beneficiaries, **program services have been relevant**. Beneficiaries are satisfied with the information provided about the services and are in general happy with the quality of services. Beneficiaries point out that competence and active engagement of program coordinators and managers is very relevant for the success of services. Although for innovation programs funding was considered the most important part of the program, there is evidence that services contributed to product or service development. For growth programs delegation trips, exhibitions and country branding were reported as most relevant services. Detailed provision of these services and benefits though differ among different types of companies. For instance, individual stands in exhibitions are preferred by large companies while small businesses are content with common stands.

Despite general satisfaction, there is still **room for improvement in program services**, especially in growth programs. Beneficiaries often reported that services should be more targeted to specific types of companies or have narrower focus. Too often events organized by the growth programs try to capture a very diverse set of companies and this is suboptimal.

## 6.2 CONCLUSIONS ON RESULTS, RELEVANCE AND IMPACT OF THE PROGRAMS

In general, the programs have **succeeded in achieving defined objectives**. There is evidence that in most of the programs a majority of the beneficiaries have introduced new products or entered new markets, or established new partnerships and networks. International competitiveness has possibly been strengthened as demonstrated by increased exports and turnover compared to industry averages in most business sectors supported by the program.

According to the survey and in-depth interviews with beneficiaries, the **programs had positive incentive effects** – the projects might not have been implemented or

would have been implemented at a smaller scale without program engagement. This applies both to innovation and growth programs. Growth programs were reported to be instrumental in increasing and pursuing ambition for entering more foreign markets. Programs did not though have much impact on reducing the time needed to enter new markets, which might be due to programs having targeted difficult markets. Innovation programs helped to develop the business plan, develop new products or services or improve the financial sustainability of existing ones.

The positive evidence collected by survey and in-depth interviews with beneficiaries is supported to some extent by **economic impact** analysis, though this is not equally evident across all programs or supported sectors. Considering the programs as a whole, firms participating in both growth and innovation programs tended to perform better than non-participants or those participating in only one program, with respect to growth in turnover, and with young firms benefitting more than average. The analysis supports the view that more active firms combining the different elements of growth enhancement tended to fare better. It is harder to identify fully robust evidence of effects from participation in only one program, but as explained above, this may well be due to methodological and data limitations, as well as the reality that benefits may only materialize later in the future.

The quantitative assessment indicates that, on the whole, the companies in the Cleanweb, Beautiful Beijing, and Waste to Energy and Bioenergy programs have been performing better in the period 2013–2019 than companies in general in Finland. At the same time, small and medium sized firms (SME's) in Beautiful Beijing performed somewhat below the national average. The companies in Wood from Finland did no better than the overall national average, but when comparing them to their counterparts, being all in the wood product sector, a positive effect is observed. The companies in other programs (Arctic Seas, Bionets, Cleantech Finland, Innovative Bioproducts) had *at aggregate level,* weaker performance than the overall national average, whereas those in Maritime and Offshore scored in aggregate only somewhat lower than the national average. When considering the performance of SME's the stated emphasis of Business Finland on those firms clearly shows. In all three Tekes programs and in two of the Finpro programs SME's performed on average better than the national average.

Recognizing that only a part of the stimulus effects could be captured in the analysis for this evaluation, as it is still too early for these effects to have fully material-

ized, and also acknowledging that success cannot be expected for every participating company, the programs appear to have facilitated some clear winners. Even though the quantitative analysis could not always prove statistical significance of program participation, the results hint at the significance of combined, or at least linked, efforts regarding innovation and export promotion, that is, participation in both innovation and export promotion programs. Notably with respect to export promotion, it is important to realize that expansion to new export markets without backing of some form of innovation, even modest, is less likely to succeed.

As regards pursuit of other objectives, programs also aimed to **build networks** in relevant cleantech and bioeconomy areas. Survey and in-depth interviews indicate that programs have succeeded in this and helped beneficiaries to develop new partnerships and networks both in Finland and abroad.

Considering the collected evidence and program design, evaluated programs **presumably had positive sustainability impacts** (as developed products, services and solutions have potential to improve sustainability). However, estimating these impacts is not possible due to lack of monitoring. Practically all these impacts are also indirect and depend entirely on the adoption of the developed products, services and solutions by the clients of the participating companies and what earlier products, services and solutions they may replace. It can be assumed that the **awareness of environmental sustainability**, circular economy, etc.and especially what opportunities they can offer in international markets has increased.

Table 7 below summarizes key results and impacts of the programs.

TABLE 7. Summary of conclusions across evaluated programs.

| PROGRAM | OBJECTIVES | RESULTS AND IMPACT OF THE PROGRAMS |
|---|---|---|
| **Tekes innovation programs** | | |
| **BioNets** | Create new bio-economy solutions, services, and networks in Finland, and enhance innovative international business. | • 53% of surveyed beneficiaries implemented bigger project because of program funding<br>• 60% of surveyed beneficiaries collaborated with more partners because of program funding<br>• For 72% of surveyed beneficiaries sustainability was a characteristic of program application<br>• Successful testing of ecosystem orchestration funding later developed in other programs<br>• 58% of companies reported to have taken a new technology into use<br>• External connections were established in 39% of the surveyed companies with domestic, and in 35% with foreign companies<br>• Altogether participating SMEs in this program achieved 42% growth from 2013 to 2019<br>• About 71% of participating firms enjoyed at least some growth |
| **Cleanweb** | The program aimed to create rapidly scalable cleantech business operations and accelerate the market entry of SMEs in the sector. | • 50 % of surveyed beneficiaries implemented bigger project because of program funding<br>• For 67% of surveyed beneficiaries sustainability was a characteristic of program application<br>• Value added of program beneficiaries has increased compared to national control group<br>• As evidenced by successful cases (e.g. Boldan presented in the report and others) the program has been instrumental in internationalizing the company offering and entering new markets<br>• 55% of companies reported to have taken a new technology into use<br>• External connections were established in 31% of the surveyed companies with domestic, and in 34% with foreign companies.<br>• Altogether participating SMEs in this program achieved 130% growth from 2013 to 2019<br>• About 84% of participating firms enjoyed at least some growth |
| **Arctic Seas** | The program aimed to promote the creation of new businesses in eco-efficient marine solutions and the sustainable use of marine resources. | • 80% of surveyed beneficiaries collaborated with more partners because of program funding<br>• 40 % of surveyed beneficiaries implemented bigger project because of program funding<br>• For 55% of surveyed beneficiaries sustainability was a characteristic of program application<br>• Export volumes of program beneficiaries has increased compared to national control group<br>• 63% of companies reported to have taken a new technology into use<br>• External connections were established in 44% of the surveyed companies with domestic, and in 35% with foreign companies<br>• Altogether participating SMEs in this program achieved 47% growth from 2013 to 2019<br>• About 71% of the participating firms enjoyed at least some growth |

...TABLE 7.

| PROGRAM | OBJECTIVES | RESULTS AND IMPACT OF THE PROGRAMS |
|---|---|---|
| **Finpro export promotion programs** | | |
| **Cleantech Finland** | Aimed to support growth of Finnish companies operative in the cleantech sector and environmental technology. | • Value added of program beneficiaries has increased compared to national control group<br>• Addressing environmental challenges was defined as one membership criterion for companies and based on the experience practice can be developed further<br>• Program was instrumental in marketing Finnish offering and raising awareness of environmental sustainability<br>• Altogether participating SMEs in this program achieved -13% growth from 2013 to 2019<br>• About 67% of the participating firms enjoyed at least some growth |
| **Innovative Bioproducts Finland** | Aimed to help Finnish companies producing bioproducts to enter growing markets, accelerate their international growth, and support companies' capabilities to be successful internationally. | • In-depth interviews reveal that the program helped most of the beneficiaries to understand target markets, enter new markets and in general accelerate their internationalization. |
| **Wood from Finland** | Aimed to help mechanical forest industry companies find new growing markets and customers and increase the sales. | • 60% of surveyed beneficiaries implemented bigger project because of program requirements<br>• Value added of program beneficiaries has increased compared to national control group<br>• Program was instrumental in marketing Finnish offering<br>• As evidenced by successful cases (e.g. JPJ-Wood presented in the report and others) the program has been instrumental in entering new markets and finding new customers<br>• Altogether participating SMEs in this program achieved 36% growth from 2013 to 2019 |
| **Waste to Energy and Bioenergy** | The program had the goal of opening new markets and accelerating Finnish exports and company growth in the energy and bioenergy areas. | • Value added of program beneficiaries has significantly increased compared to national control group<br>• 75% of surveyed beneficiaries collaborated with more partners because of program requirements<br>• Altogether participating SMEs in this program achieved 15% growth from 2013 to 2019<br>• About 72% of the participating firms enjoyed at least some growth |
| **Beautiful Beijing** | Aimed to help Finnish cleantech providers enter Chinese value networks and gain customers and sales in China. | • Export volumes of program beneficiaries has increased compared to national control group<br>• Common stands in trade fairs have been helpful in building country and company reputation and have helped to establish new partnerships and enter new markets<br>• Altogether participating SMEs in this program achieved 5% growth from 2013 to 2019<br>• About 75% of the participating firms enjoyed at least some growth |
| **Arctic Maritime and Offshore from Finland** | Aimed to accelerate the growth of Finnish maritime business and to enable a joint offering by building a network of Finnish companies. | • Export volumes of program beneficiaries has increased compared to national control group<br>• Altogether participating SMEs in this program achieved 11% growth from 2013 to 2019<br>• About 67% of the participating firms enjoyed at least some growth |

## 6.3 RECOMMENDATIONS

### PROGRAM GOVERNANCE

Business Finland should consider setting **specific goals for the broader societal impact** the programs strive to achieve. Explicitly defining the desired impact would guide setting more specific goals for program outcomes and outputs. One possibility is to align with the UN Sustainable Development Goals and their associated targets. Vinnova's program Challenge-Driven Innovation where applicants need to clarify how their project will contribute to achieving at least one of the SDG's might be considered as example.

As part of the desired societal impact, programs should define **goals for sustainability impact**. The goals should focus on the most relevant issues for each sector, but could include for instance climate change, natural resources or biodiversity. In most cases the impact would probably relate to the handprint of the products and services provided by participating companies.

**Fundamental changes to program priorities, scope or structure** should undergo a similar level of scrutiny and decision-making process as launching the programs in the first place. Sometimes pivoting during the program may be helpful and even necessary, but it must be justified with a sufficiently strong case and must be supported by program steering group or other relevant actors interested in program objectives (e.g. policy makers responsible for related national strategies). There is a need for a more systematic reporting of changes mid-program. If the governance model of programs includes a steering group, effort should be made to make sure that steering group members are up to date with recent developments and proposals related to operational management of the programs.

If programs are to be seen as important **tools to implement national strategies**, they need to be better aligned. This would require a more explicit recognition of the connection both in the strategies and programs. The strategies could more clearly present expectations for Business Finland and the programs could elaborate on how different activities contribute to implementing the strategies.

Success of the programs and impacts they generate depend very much on **sufficient and qualified program personnel**. This is especially the case for programs with networking and ecosystem building objectives where program personnel have a key role in initiating and guiding these developments. Sufficient resources should be devoted to attracting and maintaining highly qualified personnel as well as ensuring enough personnel is engaged in program implementation. This issue is particularly important with regards to skills and experience in sus-

tainability. A good starting point would be to survey the sustainability skills of the current staff.

## DATA AND DOCUMENTATION

Business Finland should consider developing a systematic **monitoring, evaluation and learning (MEL) framework**. This would include the expected outputs, outcomes and impacts of the programs. A MEL framework would also detail the procedures (including content and processes) for monitoring of services provided by the programs and information reported by participating companies. The implementation of this framework would prescribe standardized forms and documentation, enabling efficient and effective monitoring, evaluation and learning.

A MEL framework would support the generation of a better understanding of orders of magnitude of economic effects, and of the different mechanisms, contexts and company characteristics influencing the observed and inferred effects. A mapping and analysis of the complementarity and competition across available forms of support from private and public sources may also help to enhance the design, organisation and resourcing of such support services.

Impact goals (as mentioned above) would inform setting more specific **objectives for sustainability** at the level of outputs and outcomes. Depending on the program, they could specify metrics such as greenhouse gas emissions, energy or resource use or air and water pollutants. Key performance indicators should build on established tools (e.g. GRI, CDP) and focus on areas where measuring is feasible. Results should be reviewed annually, with additional measures taken if necessary. Reporting should happen both at the level of individual programs as well as jointly for the Business Finland board.

## PROGRAM SERVICES

Although in general beneficiaries reported satisfaction with program services and attributed several important developments to the value of services, several challenges were highlighted as well. It has become clear that **growth program services** targeting foreign markets have to be more specific and narrower. First, it seems more beneficial to organize the services for smaller groups of companies. Second, tailored services should be available for companies having first steps in export and more experienced exporters. Third, to avoid overcrowding of events the programs should not focus on outputs (number of events), but outcomes (e.g. company satisfaction, new partnerships established). Finally, tailored and focused services should be well advertised among the potential beneficiaries.

From the survey and interviews it can be inferred that **ecosystem orchestration** works best for companies that have already been to some extent networked. There is also some evidence that not all members benefit from or value the operations of the ecosystem. This suggests that some preliminary screening and feasibility analysis could be performed by program before proceeding with new ecosystem support and new members.

Furthermore, some degree of **tailoring of program elements** could improve overall effectiveness. On the other hand, a totally open and liberal approach regarding participation can also reduce effectiveness owing to larger shares of less fitting and less motivated companies. Several studies hint at advantages of program approaches over loose service portfolios in terms of eventual overall effects on export performance or economic performance in general (Volpe Martincus & Caballo 2019). Yet, as noted above and also indicated in the survey and the interviews some degree of company-specific tailoring options within programs seems recommendable.

## SUSTAINABILITY

The process of choosing program priorities should routinely include an assessment of **key sustainability risks** and measures to mitigate them. Sectors should not be simply assumed sustainable even if companies operating in them provide solutions to particular challenges. If any activities are considered in high-risk sectors, they should undergo thorough scrutiny, with an explicit decision by the Business Finland board.

Business Finland should consider **quantitative targets for funding** allocated to addressing sustainability challenges. This could be similar to the targets set earlier by the government for Tekes to provide a certain percentage of funding to cleantech, but broader in scope and more ambitious in scale. The targets could be gradually increased over time.

Companies and activities selected to participate in programs should be screened against **clear and transparent sustainability criteria**. These should include both contributing to positive impacts as well as reducing negative impacts and managing risks. Priority should be given to companies and activities that can manifest the largest and broadest positive impact.

Requirements and criteria could be **differentiated based on the size of the company or project**. Special attention should be paid to limit the administrative burden for SMEs. Business Finland could consider tools (e.g. standard reporting formats), training and advice for smaller companies on measuring and reporting their sustainability impact.

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Volpe Martincus, C. and Carballo, J. (2010). Export Promotion: Bundled Services Work Better, *The World Economy,* doi: 10.1111/j.1467-9701.2010.01296.x

# ANNEX 1. DETAILED METHODOLOGY

## DESK RESEARCH

Desk research analysed various written documents relevant for the evaluation. The texts can be grouped into two main categories: national strategies and their evaluations and program documentation.

TABLE 8. National strategies included in the analysis.

| YEAR | STRATEGY | IN FINNISH |
|---|---|---|
| 2012 | Strategic Program for the Forest Sector 2011–2015 | Metsäalan strateginen ohjelma 2011–2015 |
| 2013 | Finland's Strategy for the Arctic Region 2013 | Suomen arktinen strategia 2013 |
| 2013 | National Energy and Climate Strategy | Kansallinen energia- ja ilmastostrategia |
| 2014 | Maritime Transport Strategy for Finland 2014–2022 | Suomen meriliikennestrategia 2014–2022 |
| 2014 | The Finnish Bioeconomy Strategy | Suomen biotalousstrategia |
| 2014 | Government's Strategy to Promote Cleantech Business in Finland | Valtioneuvoston strategia cleantech-liiketoiminnan edistämisestä |
| 2014 | Finland as the path setter for natural resources economy in 2050 | Suomi kestävän luonnonvaratalouden edelläkävijäksi 2050 |
| 2014 | Agriculture climate program | Maatalouden ilmasto-ohjelma |
| 2014 | Government forest policy report 2050 | Valtioneuvoston metsäpoliittinen selonteko 2050 |

**National strategies** were analysed to understand if and how programs contribute to implementing national policy priorities. The analysis covers official policy documents at the national government level with varying titles, including strategies, programs (ohjelma) and government reports (selonteko). We used the English versions of the documents when available.

Strategies were selected primarily based on topical and temporal fit. Topically we selected strategies that were directly or mostly relevant to the themes of the analysed programs. Temporally we included strategies that either preceded the programs or coincided with their launch and first steps so that they could have, at least in principle, affected the programs.

The strategies were analysed by reading the documents and noting down key elements in a spreadsheet in English. Main topics covered were

- the vision of the strategy
- key priorities and sectors
- references to the analysed programs and Business Finland

- other elements related to innovation and export promotion

Due to the fairly large text mass, additional word analysis was carried out using the service Wordclouds.com. The full texts of all strategies were entered into the tool, either using the original English text or a machine-translated version. The resulting word lists were screened manually, removing nonsensical and irrelevant words (e.g. "page" and "also"). For the purposes of this analysis, morphologically different but conceptually similar words (e.g. "sustainable" and "sustainability") were merged. For each strategy, the 50 most frequent words were included.

The material also included evaluation documents of the included strategies.

TABLE 9. Strategy evaluations included in the analysis.

| YEAR | DOCUMENT | IN FINNISH |
|---|---|---|
| 2016 | Bioeconomy and cleantech in Finland – Assessment of Strategies and development of suggestions | Biotalous ja cleantech Suomessa – strategioiden arviointi ja toimenpidesuositukset |
| 2018 | Preparation of the government bioeconomy strategy | Valtioneuvoston biotalousstrategian valmistelu |
| 2018 | Implementation of the government cleantech strategy | Valtioneuvoston cleantech-strategian toimeenpano |
| 2020 | Follow-up evaluation report: Implementation of the government cleantech strategy | Jälkiseurantaraportti: Tarkastuskertomus 5/2018 Valtioneuvoston cleantech-strategian toimeenpano |

**Program documentation** included documents provided by Business Finland. The total number of documents is close to 2,000.

TABLE 10. Number of documents provided for each program.

| PROGRAMS | NUMBER OF DOCUMENTS |
|---|---|
| **Tekes programs** | |
| BioNets | ~220 |
| Cleanweb | ~80 |
| Arctic Seas | ~1,200 |
| **Finpro programs** | |
| Cleantech Finland | ~50 |
| Innovative Bioproducts Finland | ~70 |
| Wood from Finland | ~60 |
| Waste to Energy and Bioenergy | ~70 |
| Beautiful Beijing | ~20 |
| Maritime and Offshore from Finland | ~150 |
| **Total** | ~1,900 |

There is a lot of variety in the documentation both in terms of technical properties and substantive quality. This includes different formats (e.g. Word documents, PowerPoint presentations and PDF files), languages (Finnish and English) and text genres (e.g. funding proposals, reports, presentations, meeting minutes and brochures). The material also covers both public and in-

ternal documents, texts in machine-readable format and scans of printed documents as well as documents at various levels of readiness (including drafts and multiple iterations of the same texts).

The sheer number and variety of material made it impossible to analyse everything within the scope of this project. The analysis prioritised primarily the following types of documents:

- program applications outlining original plans
- annual and final reports outlining results and lessons learnt
- presentations, publicity material, steering group minutes and the like outlining progress and narratives

Observations were noted down in a spreadsheet applying a common format to all programs. Additional documents were included in the analysis sample until sufficient information for all programs had been reached.

## QUANTITATIVE ANALYSIS

The quantitative analysis aims to answer three questions:

1. establish whether the various forms of monetary and non-monetary support do make a difference for the receiving companies as compared to non-receiving companies, and to what extent that varies across program types;
2. establish what forms of support (or combinations of these) seem more crucial for success of receiving firms, and to what extent that varies across program types;
3. and establish to what extent quantitative objectives of the programs on for example employment, turnover, export shares, number of patents and estimated contribution to environmental goals have been achieved.

Business Finland has been very helpful with data collection, nonetheless the obtained data imply limitations on the feasibility to infer meaningful relations. For the firms which participated in the Tekes programs more characteristics can be taken into account than for the firms in the Finpro programs.

As regards the definition of control groups, these consist of disaggregated economic sectors (5-digit) and firms from other Business Finland programs. We have, however, no data of firms using other similar public and private services, nor can the effect of green public procurement be assessed.

Some notes regarding interpretation of results have to be made. For many programs a part of the effects on growth in value added and export is likely to emerge after 2019. Due to the different timing of programs there was different exposure to the general decline and recovery of the economy (decline until 2015, recovery from 2016 onwards). Some programs have more dynamics in compo-

sition of participating group over time (in- and outflow) than others.

## INTERNET-BASED SURVEY AND TELEPHONE INTERVIEWS

Beneficiary companies of all evaluated programs were identified from Business Finland data base and program documentation. Web-based survey was designed for each program. All surveys contained the same questions, but answer options for the questions covering program services were adjusted for each program based on specific services offered. Invitation to respond to the survey was sent to e-mail addresses of companies contact persons. Survey invitation explained the context for the survey and a support letter from Business Finland was attached to the invitation. The survey was open for one month and three reminders were sent to encourage response.

In addition, telephone interviews were performed with companies that had not responded to the on-line survey. For telephone interviews the same questionnaire was used as for the on-line survey. To ensure representativeness of final sample, telephone interviews were made with companies representing diverse industry sectors and sizes.

Despite the effort made to collect more responses with the help of telephone survey, surveys of Maritime and Offshore, Innovative Bioproducts, Cleantech Finland and Beautiful Beijing had insufficient response rate (below 20%) and the results are not presented in this report. According to the feedback received from beneficiaries (mainly during the telephone interviews) low response rates can be explained by change of personnel in the company, inability of beneficiaries to recall the details of participation or inability to recognize or distinguish the programs as well as general survey fatigue.

To compensate for the lack of survey results extra effort was made to review the documentation of relevant programs and summarize the results of beneficiary surveys performed during the implementation of the programs. These surveys reveal some information on satisfaction with specific program services.

## IN-DEPTH INTERVIEWS

The evaluation team conducted in-depth interviews with three different target groups:

1. program managers and coordinators to ensure we have all the relevant information, material and feedback so that the analysis is based on correct understanding of the programs;
2. selected beneficiaries to gain further insight and evidence on the evaluation questions; and
3. policy makers to understand the role of the programs within the wider context of national strategies (e.g. expectations, perceptions of the importance, added value and impact)

The in-depth interviews were conducted as semi-structured theme interviews with slightly different templates for the beneficiaries of Tekes and Finpro programs. Each interview with program managers and policy makers took about one hour, and with beneficiaries about 30 minutes. The templates for each target group and program are presented below. Interviews were conducted online in Zoom or Teams. The language of the interviews was Finnish.

The program managers were interviewed twice, first to ensure that the evaluation team had all relevant material regarding the program and second, to discuss the background, success factors, challenges and lessons learned of the programs. In the first phase, 11 interviews were conducted, since gathering all relevant information required interviewing several persons from the same programs. As the first phase was to gather documents and material, no template was used. In the second phase, 9 interviews were conducted with the program managers.

20 interviews were conducted with program beneficiaries, at least two interviews per program. The interviews covered several topics from results and impact of the program through quality of the program services to recommendations for future programs.

Five interviews were conducted with policy makers, which included persons from Ministry of Economic Affairs and Employment, Ministry of Agriculture and Forestry and Ministry of the Environment. These interviews concentrate especially on the role and added value of the programs in implementing national strategies.

Templates used to guide the interviews are presented below.

## TEMPLATE FOR THE INTERVIEWS WITH PROGRAM MANAGERS

**Rationale and strategic fit**

- Why was the program launched?
- How did national strategies X (the specific strategies relevant to this program) guide the planning and implementation of the program?
- Did the program succeed in contributing to implementing the strategies? If yes, in what way?

**Program objectives and environmental sustainability**

- What were the program objectives?
- How was environmental sustainability taken into account in the program?

For example:

- Were environmental sustainability issues present in the services provided to beneficiaries by the program? If yes, how? Or if no, reasons why?
- Was environmental sustainability a criterion of project funding/program participation?

- Were environmental sustainability issues monitored during the program? For example: How the program changed the climate impacts of the beneficiaries.
- Did the program have positive (or negative) sustainability impacts?

**Implementation**

- Was the program implemented as planned or was it redirected during its implementation? If redirected, why and with what consequences?
- What were the key lessons learned during the implementation of the program? What worked and what didn't work?
- Looking back, what would you do differently?
- How were the results of the program monitored?
- How was the impact of the program measured?
- What kind of reporting (specific information, frequency) was required of beneficiaries?

**Meeting objectives, results and impact of the program**

- From your perspective, to which extent were the program objectives met?
- What do you think were the most important concrete results of the program?
- What was the impact of the program in the society after it ended *(Note to interviewer: please ensure the answers are at the level of outcome or impact, not just restating of results)*?
- Has the impact been sustained after the program?
- What was the added value of the program to the broader society compared to the impact of other policies and programs?

**Recommendations**

Any future development ideas for Business Finland Programs? Particularly with respect to environmental sustainability?

## TEMPLATE FOR THE INTERVIEWS WITH BENEFICIARIES OF THE TEKES PROGRAMS

**Behavioural impact**

Motivation/reasons for participation

- Why did you participate in the program(s)?
- What did you expect from the program(s)?

What changed because of the program?

- What changes did you make to your plans because of the program(s)?
- Was a new project/activity initiated because of the program(s)? Was an already existing project/activity redesigned/how?
- Were plans changed during implementation because of program services? How?

**Value of program services**

Use and added value of program and related services

- Which program services did you use?
- How did the program services help you?
- Did you participate in any other initiatives at the same time? How useful were these?

Information about services

- Was information on services well communicated?
- Did you learn about the services on time?

Missing services

- Did you experience particular challenges with your project? What kind of challenges?
- How did you address these challenges?
- Could or should there have been additional program activities/services that would have helped you to address these challenges?
- Were some program services missing or of poor quality?
- What services would you suggest for future programs?

**Impact**

Outcome and next steps

- What did you develop during the program(s)? A new or improved product/service/process? Something else/what?
- Is what you developed already commercialized and/or taken into use? If not, when will it be commercialized/taken into use? If yes, what is its role/share of your business?
- Did you seek further funding or support for your commercialisation/utilization effort? What?
- To what extent are your original economic projections/calculations still valid?

**Program benefits**

- What benefits did you get in participating in the program(s) or in other related activities?
- Were the benefits as expected or different?

**Sustainability**

- How was sustainability taken into account in the program?
- Were sustainability issues present in the services provided by the program?
- Did you talk about sustainability in your discussions with representatives of the program?
- Was sustainability a criterion of project funding/program participation?
- Were sustainability issues, for example climate impacts, monitored during the program?

**Other benefits**

- Are there others (e.g. collaborators, business partners, clients, etc.) who may benefit from your participation in the program(s) either directly or indirectly? How?

## TEMPLATE FOR THE INTERVIEWS WITH BENEFICIARIES OF THE FINPRO PROGRAMS

**Behavioural impact**

Motivation/reasons for participation

- Why did you participate in the program(s)?
- What did you expect from the program(s)?

What changed because of the program?

- What changes did you make to your plans because of the program(s)?
- Was a new activity initiated because of the program(s)? Was an already existing activity redesigned/how?
- Were plans changed during implementation because of program services? How?

**Value of program services**

Use and added value of program and related services

- Which program services did you use?
- How did the program services help you?
- Did you participate in any other initiatives at the same time? How useful were these?

Information about services

- Was information on services well communicated?
- Did you learn about the services on time?

Missing services

- Did you experience particular challenges with your activity? What kind of challenges?
- How did you address these challenges?
- Could or should there have been additional program activities/services that would have helped you to address these challenges?
- Were some program services missing or of poor quality?
- What services would you suggest for future programs?

**Impact**

Outcome and next steps

- What did you do during the participation in the program(s)? Did you enter new markets/get new investors? Something else/what?
- Did you seek further funding or support for your internationalization effort? What?
- To what extent are your original economic projections/calculations still valid?

**Program benefits**

- What benefits did you get in participating in the program(s) or in other related activities?
- Were the benefits as expected or different?

**Sustainability**

- How was sustainability taken into account in the program?
- Were sustainability issues present in the services provided by the program?
- Did you talk about sustainability in your discussions with representatives of the program?
- Was sustainability a criterion of program participation?
- Were sustainability issues, for example climate impacts, monitored during the program?

**Other benefits**

- Are there others (e.g. collaborators, business partners, clients, etc.) who may benefit from your participation in the program(s) either directly or indirectly? How?

## TEMPLATE FOR THE INTERVIEWS WITH CIVIL SERVANTS IN KEY MINISTRIES AND OTHER RELEVANT PERSONS

**Definitions**

Business Finland = Business Finland and its predecessors Tekes and Finpro
Strategies = Diverse set of national level policy documents, including strategies, programs and action plans

**Strategic fit**

- What is the role of innovation funding and export promotion in general in the implementation of national strategies/specific strategies under your ministry's responsibility?
- What is the role of Business Finland or its predecessors Tekes and Finpro in the implementation of national strategies/ specific strategies under your ministry's responsibility?
- What has been their added value compared to other measures?
- How have the Business Finland/Tekes/ Finpro programs helped to fulfil the sustainability objectives of the National Strategies?

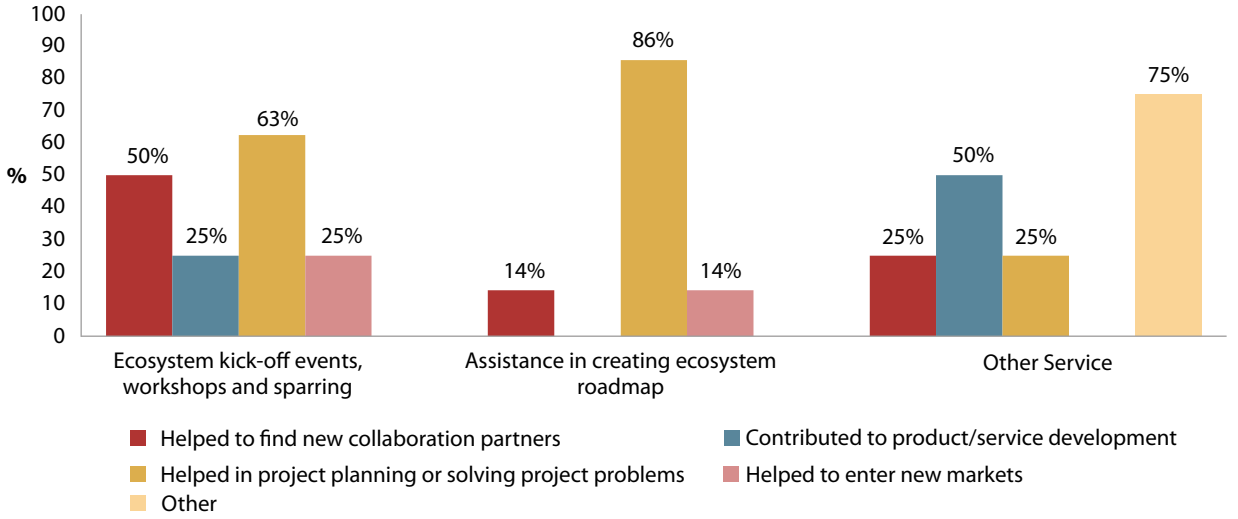
- Can you provide an example relating to a specific program?
- Is this contribution dependent on other policies or government initiatives?
- Have the Business Finland/Tekes/ Finpro programs had an impact on the development of National Strategies?
- What kind of dialogue has your ministry had with Business Finland/Tekes/ Finpro on the implementation of strategies?
- Has Business Finland been involved in the drafting process of strategies?
- Have you (or someone from the ministry) been involved in drafting the programs of Business Finland?
- What kind of challenges, if any, have you encountered in the alignment of Business Finland/Tekes/Finpro programs with National Strategies?
- How could the programs and strategies be better aligned with each other?
- How could Business Finland better be used in the implementation of national strategies?

# ANNEX 2. SURVEY RESULTS

The following figures illustrate survey results on the value of specific program services for each evaluated program. Only programs with sufficient survey response rate are presented.

## BIONETS PROGRAM SURVEY RESULTS ON THE VALUE OF SPECIFIC SERVICES

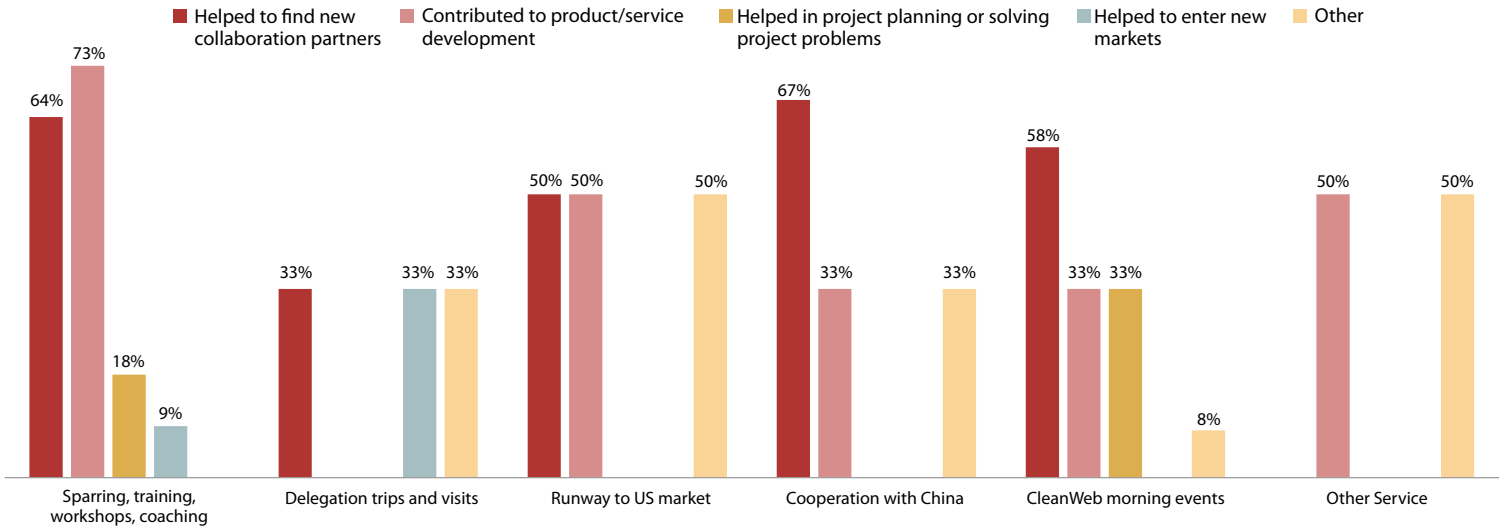
FIGURE 17. Answers to question "You indicated you found the following program services useful. How did they support you?"




Other services listed by the respondents include reference to Tekes loans and research performed by research partners. Other benefits attributed to the services are assistance in starting piloting and gaining better understanding of ecosystem functioning and benefits.

## CLEANWEB PROGRAM SURVEY RESULTS ON THE VALUE OF SPECIFIC SERVICES

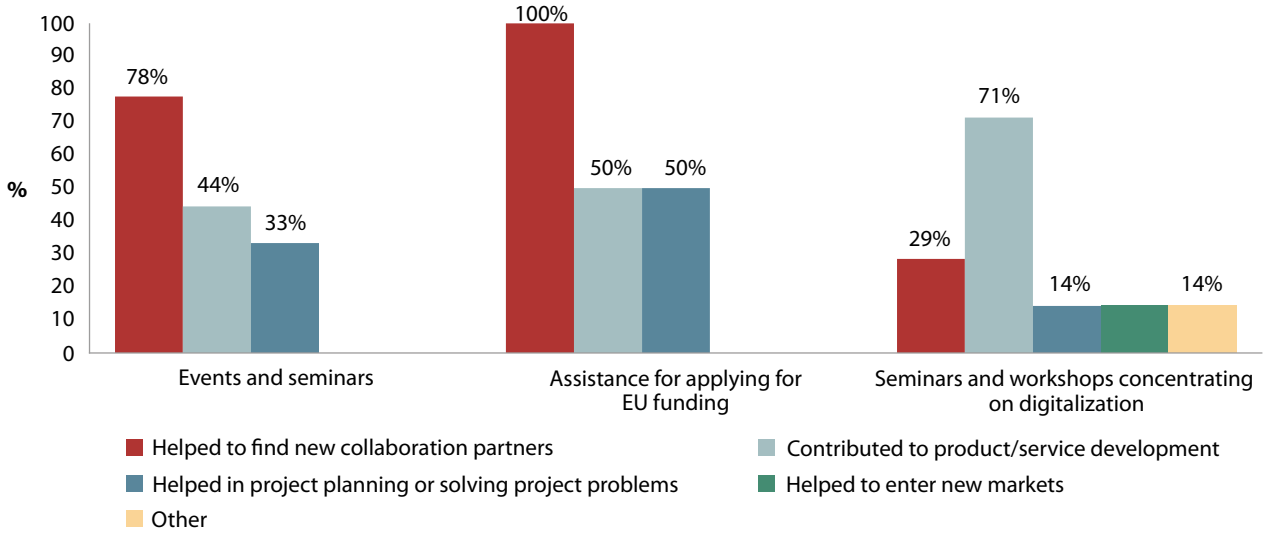
FIGURE 18. Answers to question "You indicated you found the following program services useful. How did they support you?"




Other services listed by the respondents include reference to research conducted by project partners, some specific activities towards USA market and start-up funding.

## ARCTIC SEAS PROGRAM SURVEY RESULTS ON THE VALUE OF SPECIFIC SERVICES

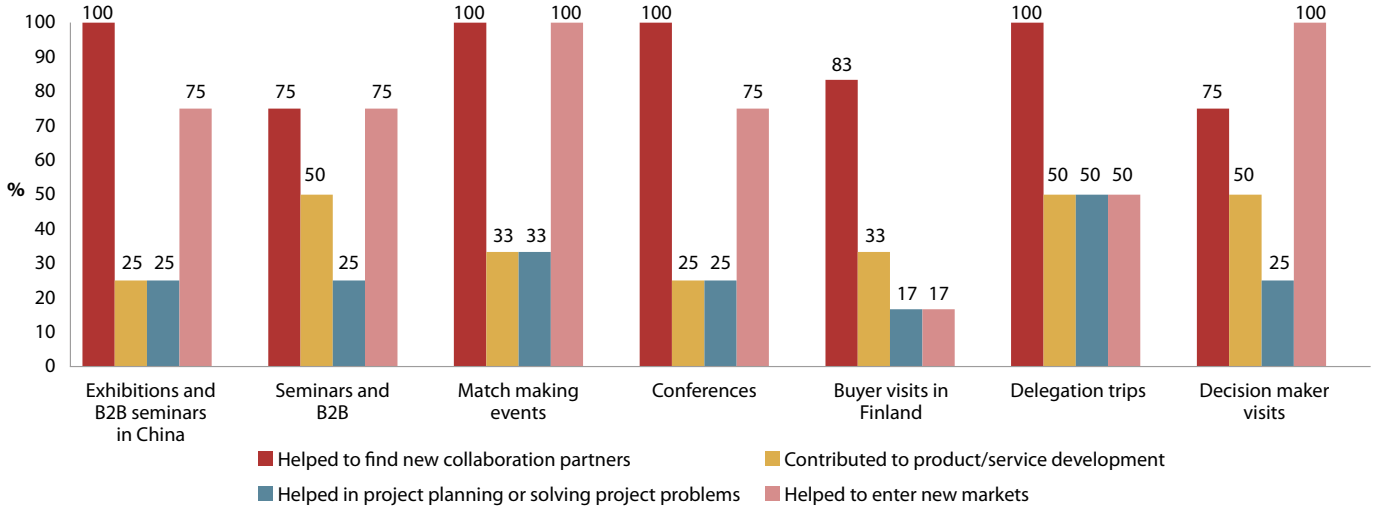
FIGURE 19. Answers to question "You indicated you found following program services useful. How did they support you?"




When survey respondents indicated they had other benefits from the services, the comment pointed to actual value of some services and other specific benefits were not listed.

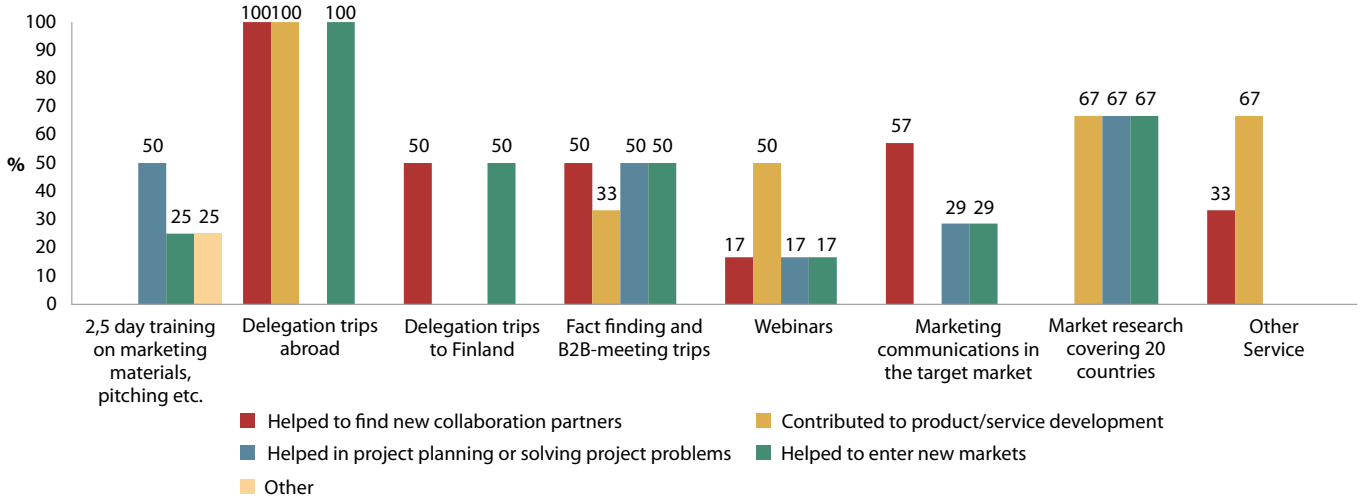
## WOOD FROM FINLAND PROGRAM SURVEY RESULTS ON THE VALUE OF SPECIFIC SERVICES

FIGURE 20. Answers to question “You indicated you found the following program services useful. How did they support you?”



## WASTE TO ENERGY AND BIOENERGY PROGRAM SURVEY RESULTS ON THE VALUE OF SPECIFIC SERVICES

FIGURE 21. Answers to question "You indicated you found the following program services useful. How did they support you?"




When survey respondents indicated they had other benefits from the services, the comments pointed to broadening the understanding of target markets and help in shaping marketing message.

# ANNEX 3. RESULTS OF QUANTITATIVE ANALYSIS

## A SUMMARY OF AVAILABLE DATA, ENCOUNTERED LIMITATIONS, AND CONSEQUENCES FOR INTERPRETATION

Business Finland provided various datasets with information regarding admission to and participation in the evaluated programs, where usually each record represented one participating organisation (companies, research organisations, and some other organisations such as associations). For the Finpro programs, with one exception, no systemized information on the extent of participation per company was available in these datasets. Yet, for some Finpro programs participating firms were rated as active member or (just) member. Furthermore, for all participating firms next to name and company register number the economic sector classification code (ISIC at 3/5 digit level) as well as data on turnover, value added, operating profit, export, and number of employees, within the period 2010-2019 in *as far as these data were available for the included companies*. For the companies taking part in the Tekes programs more information was available at company level, such as assessment of different domains of risk regarding innovation success of a proposed project, the age of the company, and the location of (the involved segments of) the company, denoted by province and municipality. Comparable data for a small amount of non-participating companies was available. Similarly, comparable data were collected from Statistics Finland at (sub)sector level (at 3/5 digit level) as another option for comparison. These subsector data of Statistics Finland were used for: (1) comparison of aggregate performance of collections of participating firms from the same subsector with performance of the subsector as reported by Statistics Finland (Figure 11 in section 4.3), and (2) supplementing the collection of comparison firms of non-participating firms by using the subsector averages as synthetic firm representations.

For many companies there are years with (partly) missing data because of the establishment of the company during the period, changes in the company, reporting errors, limitations on disclosure, etc. Furthermore, the evaluated programs have started and ended in different years over the past decade, whereas about 13% of the firms has participated in more than one program. The consequence is that there is no clear single base year for comparison with a final year. Since effects of program participation will build up over the course of several years (say varying between 3 and 7 years), a larger time dif-

ference between base year and end year of comparison would seem recommendable. Yet, with that approach quite some starting firms would drop out of the analysis, whereas supporting start-ups and new firms is as a crucial task of Business Finland. Therefore, in the analysis also performance over shorter time spans (i.e. 3 years) are taken into account. Key dependent variables tested are cumulative growth of turnover and cumulative growth of export. Especially for smaller firms cumulative growth can attain high levels, i.e. a factor 10 or 20 and more. This feature may bias the influence of small firms in the estimates and therefore several levels of truncation have been explored. Usually, truncation is applied at a factor 40. For the same reason, the base year is sometimes not 2012 or 2013, but a later year, as the first year or even years of a company output can be very low, resulting in misleadingly high growth factors. In this way the total number of comparison firms rose from 19 to 34 (see also the tables of variable characteristics of participating and comparison firms on page 75).

Altogether the nature of the data nevertheless implies quite significant restrictions on applicable methods. More advanced methods, such as difference-in-differences estimations (Munch and Schaur 2018) are not feasible or would demand additional data collection and pre-processing. Such endeavours are not feasible within the context of this type of evaluation assignments. In the future this obstacle could be attenuated, perhaps even to a fair extent, if systematic and rigorous data collection and performance monitoring are developed into an own domain within Business Finland. As discussed in section 2.3 and Annex regarding limitations, data collection and performance monitoring should also cover activities and participating companies of other significant innovation and export promotion support services.

## APPLIED ESTIMATIONS: ORDINARY LEAST SQUARES (OLS)

**Explanatory variables:**

- binary indicators (0 – 1) referring to: (1) single or multiple program participation (several indicators), (2) being a young firm or not, (3) being rated as an active member in a program (only some Finpro programs), (4) firm location in Uusimaa province or elsewhere, and (5) the firm having no exports in the base year (usually 2014)
- number of employees in the firm (often the natural logarithm of the number is used, to better represent non-linear effects of this characteristic)
- growth rate of turnover in the year 2014 i.e. $(T_{2014} - T_{2013})/T_{2013}$
- risk rating of the project-company combination to be granted (Tekes programs only) with respect to resourcing, technology, the firm's economic condition, and aspired markets

**Dependent variables:**

- cumulative growth index of turnover (default 2013 = 100; for a part of the firms more recent years are base year (2015 or 2016)) – growth index = $T_{2019}/T_{2013}*100$
- cumulative growth index of export (default 2013 = 100; for a part of the firms more recent years are base year (2015 or 2016)) – growth index = $X_{2019}/X_{2013}*100$

## VARIABLE LIST

| VARIABLE (AS NAMED IN SECTION 4.2) | SHORT VARIABLE NAMES IN ESTIMATIONS |
|---|---|
| **Binary variables (0 not valid; 1 valid)** | |
| Active member rating | Active member |
| Firm location Uusimaa | Uusimaa? |
| No export by that firm in 2014 (2015 or 2016, if these are base year) | No export in T0 |
| In Tekes (only one program) | Any Tekes |
| In Finpro (only one program) | Any Finpro |
| In both Finpro + Tekes program(s) | Finpro + Tekes |
| In several Finpro programs | 2+ Finpro |
| Young firms (< 6 years) | Young firms |
| **Other variables** | |
| Number of employees | N_empl (or ln(N_empl) |
| % change in turnover from 2013 to 2014 | danT 2014 |
| Resourcing risk | (same) |
| Economic risk | (same) |
| Technology risk | (same) |
| Market risk | (same) |

Please note that for estimations *at single program level* the variables referring to participation in only program are either pointless (if belonging to the considered program type) or is in fact same as the variable referring to participartion in both Finpro and Tekes program.

The risk rating variables, used in the Tekes programs, are based on indications included in the administrative information considered during the application for funding, i.e. the prevailing conditions in the program's starting year or its preceding year.

## ESTIMATION RESULTS

### All programs together – cumulative growth index of turnover

Alternative including variable for growth in 2014

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.345299 |
| R Square | 0.119231 |
| Adjusted R Square | 0.109861 |
| Standard Error | 4.209191 |
| Observations | 571 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 6 | 1352.711 | 225.4518 | 12.72496 | 1.70043E-13 |
| Residual | 564 | 9992.55 | 17.71729 | | |
| Total | 570 | 11345.26 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 3.692 | 0.782 | 4.719 | 0.000 | 2.155 | 5.229 |
| young firms | 3.101 | 1.052 | 2.948 | 0.003 | 1.035 | 5.168 |
| danT_2014 | 0.888 | 0.118 | 7.528 | 0.000 | 0.656 | 1.120 |
| any Finpro | -1.313 | 0.745 | -1.761 | 0.079 | -2.777 | 0.152 |
| Tekes + Finpro | 1.675 | 1.089 | 1.538 | 0.125 | -0.464 | 3.814 |
| any Tekes | -1.061 | 0.866 | -1.225 | 0.221 | -2.763 | 0.640 |
| ln (N_empl) | -0.133 | 0.095 | -1.399 | 0.162 | -0.319 | 0.054 |

Alternative without variable for growth in 2014

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.141097 |
| R Square | 0.019908 |
| Adjusted R Square | 0.01208 |
| Standard Error | 4.821296 |
| Observations | 632 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 5 | 295.5787 | 59.11573 | 2.543171 | 0.027228409 |
| Residual | 626 | 14551.3 | 23.24489 | | |
| Total | 631 | 14846.88 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 4.2592 | 0.8847 | 4.8141 | 0.0000 | 2.5218 | 5.9966 |
| Tekes + Finpro | 0.4737 | 1.1868 | 0.3991 | 0.6900 | -1.8570 | 2.8044 |
| Young firms | 1.1038 | 0.7546 | 1.4629 | 0.1440 | -0.3780 | 2.5856 |
| any Finpro | -0.9752 | 0.8471 | -1.1512 | 0.2501 | -2.6387 | 0.6884 |
| any Tekes | -0.3400 | 0.9509 | -0.3576 | 0.7208 | -2.2073 | 1.5273 |
| ln (N_empl) | -0.2555 | 0.1034 | -2.4703 | 0.0138 | -0.4587 | -0.0524 |

## All firms – Characteristics of used variables

| Participating firms | any Tekes | any Finpro | 2+ Finpro | 2+ Tekes | Tekes + Finpro |
|---|---|---|---|---|---|
| minimum | 0 | 0 | 0 | 0 | 0 |
| maximum | 1 | 1 | 1 | 1 | 1 |
| average | 0.262 | 0.818 | 0.048 | 0.009 | 0.080 |
| *dCuT< 40* | 0.250 | 0.836 | 0.059 | 0.010 | 0.087 |
| median | | | | | |
| *dCuT< 40* | | | | | |
| standard deviation | 0.440 | 0.386 | 0.214 | 0.092 | 0.271 |
| *dCuT< 40* | 0.433 | 0.371 | 0.235 | 0.100 | 0.282 |

| Participating firms | no export in T0 | starter | N_employed | cum. growth Turnover | cum. growth Export |
|---|---|---|---|---|---|
| minimum | 0 | 0 | 0 | 0.001 | 0.000 |
| maximum | 1 | 1 | 4894 | 31.460 | 38.394 |
| average | 0.198 | 0.155 | 112 | 7.808 | 12.725 |
| *dCuT< 40* | 0.114 | 0.074 | 147 | 2.573 | 3.726 |
| median | | | 13 | 1.324 | 1.523 |
| *dCuT< 40* | | | 23 | 1.301 | 1.416 |
| standard deviation | 0.399 | 0.362 | 416 | 52.991 | 53.470 |
| *dCuT< 40* | 0.318 | 0.262 | 480 | 3.952 | 6.308 |

| Comparison firms | any Tekes | any Finpro | 2+ Finpro | 2+ Tekes | Tekes + Finpro |
|---|---|---|---|---|---|
| minimum | 0 | 0 | 0 | 0 | 0 |
| maximum | 0 | 0 | 0 | 0 | 0 |
| average | | | | | |
| median | | | | | |
| standard deviation | | | | | |

| Comparison firms | no export in T0 | starter | N_employed | cum. growth Turnover | cum. growth Export |
|---|---|---|---|---|---|
| minimum | 0 | 0 | 2 | 0.316 | 0.637 |
| maximum | 0 | 1 | 1368 | 52.480 | 33.471 |
| average | | 0.09 | 79 | 3.210 | 4.832 |
| median | | | 19 | 1.270 | 1.508 |
| standard deviation | | 0.29 | 236 | 8.816 | 8.795 |

## Beautiful Beijing – cumulative growth index of turnover

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.370129 |
| R Square | 0.136995 |
| Adjusted R Square | 0.048934 |
| Standard Error | 8.63491 |
| Observations | 55 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 5 | 579.9685 | 115.9937 | 1.555675 | 0.190235 |
| Residual | 49 | 3653.522 | 74.56167 | | |
| Total | 54 | 4233.49 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 3.17 | 3.02 | 1.05 | 0.30 | -2.90 | 9.24 |
| danT_2014 | -6.23 | 3.53 | -1.76 | 0.08 | -13.33 | 0.87 |
| young firms | 6.50 | 4.12 | 1.58 | 0.12 | -1.78 | 14.78 |
| any Finpro | 0.19 | 2.57 | 0.07 | 0.94 | -4.98 | 5.36 |
| Tekes + Finpro | 0.69 | 6.10 | 0.11 | 0.91 | -11.58 | 12.95 |
| ln(Nempl) | -0.21 | 0.90 | -0.24 | 0.81 | -2.01 | 1.59 |

## Characteristics of used variables

| | 2+ Finpro | 2+ Tekes | Tekes + Finpro | danT_ 2014 | STARTER | active member | N_ employed | cum. growth Turnover | cum. growth Export |
|---|---|---|---|---|---|---|---|---|---|
| minimum | 0 | 0 | 0 | -0.929 | 0 | 0 | 1 | 0.02 | 0.00 |
| maximum | 1 | 0 | 1 | 0.894 | 1 | 1 | 4080 | 43.10 | 110.38 |
| average | 0.381 | | 0.143 | -0.001 | 0.143 | 0.81 | 291 | 3.63 | 9.51 |
| *dCuT< 40* | 0.4 | | 0.15 | 0.045 | 0.15 | 0.85 | 305 | 1.66 | 1.41 |
| median | | | | -0.011 | | | 30 | 1.36 | 1.58 |
| *dCuT< 40* | | | | -0.011 | | | 40 | 1.28 | 1.31 |
| standard deviation | 0.50 | | 0.36 | 0.418 | 0.36 | 0.40 | 899 | 9.13 | 26.54 |
| *dCuT< 40* | 0.50 | | 0.37 | 0.369 | 0.37 | 0.37 | 920 | 1.27 | 1.21 |

## Cleantech – turnover

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.435887 |
| R Square | 0.189997 |
| Adjusted R Square | 0.15738 |
| Standard Error | 5.432828 |
| Observations | 156 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 6 | 1031.572 | 171.9287 | 5.825007 | 0.000018 |
| Residual | 149 | 4397.827 | 29.51562 | | |
| Total | 155 | 5429.399 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 2.579 | 1.228 | 2.099 | 0.037 | 0.151 | 5.006 |
| any Finpro | -0.877 | 1.111 | -0.789 | 0.431 | -3.072 | 1.319 |
| danT_2014 | 0.875 | 0.190 | 4.612 | 0.000 | 0.500 | 1.250 |
| no export in T0 | 1.803 | 1.628 | 1.108 | 0.270 | -1.413 | 5.020 |
| Tekes + Finpro | 0.734 | 1.595 | 0.460 | 0.646 | -2.417 | 3.885 |
| young firms | 7.635 | 2.329 | 3.279 | 0.001 | 3.034 | 12.237 |
| ln (N_empl) | -0.011 | 0.239 | -0.048 | 0.962 | -0.484 | 0.461 |

## Cleantech – export

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.272193 |
| R Square | 0.074089 |
| Adjusted R Square | 0.045817 |
| Standard Error | 8.045154 |
| Observations | 136 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 4 | 678.4589 | 169.6147 | 2.620564 | 0.037814241 |
| Residual | 131 | 8478.911 | 64.72451 | | |
| Total | 135 | 9157.37 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 5.722 | 1.242 | 4.606 | 0.000 | 3.265 | 8.179 |
| 2+ Finpro | -3.244 | 1.848 | -1.755 | 0.082 | -6.900 | 0.412 |
| Tekes + Finpro | 6.020 | 2.272 | 2.649 | 0.009 | 1.524 | 10.515 |
| young firms | -2.136 | 4.110 | -0.520 | 0.604 | -10.266 | 5.995 |
| ln (N_empl) | -0.322 | 0.327 | -0.986 | 0.326 | -0.969 | 0.324 |

## Cleantech – characteristics of used variables

| | 2+ Finpro | 2+ Tekes | Tekes + Finpro | danT_ 2014 | no export in T0 | starter | N_ employed | cum. growth Turnover | cum. growth Export |
|---|---|---|---|---|---|---|---|---|---|
| minimum | 0 | 0 | 0 | -0.716 | 0 | 0 | 0 | 0.034 | 0.00 |
| maximum | 1 | 1 | 1 | 22.667 | 1 | 1 | 4894 | 23.788 | 241.07 |
| average | 0.176 | 0.007 | 0.115 | 0.679 | 0.108 | 0.047 | 245 | 5.705 | 10.13 |
| *dCuT< 40* | 0.183 | 0.007 | 0.113 | 0.593 | 0.113 | 0.049 | 254 | 2.629 | 4.33 |
| median | | | | 0.044 | | | 21 | 1.267 | 1.46 |
| *dCuT< 40* | | | | 0.043 | | | 21 | 1.198 | 1.31 |
| standard deviation | 0.382 | 0.082 | 0.320 | 2.632 | 0.312 | 0.213 | 749 | 20.377 | 27.70 |
| *dCuT< 40* | 0.388 | 0.084 | 0.317 | 2.467 | 0.317 | 0.217 | 763 | 3.677 | 7.06 |

## Maritime & Offshore – turnover

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.369851 |
| R Square | 0.13679 |
| Adjusted R Square | 0.119113 |
| Standard Error | 4.272301 |
| Observations | 300 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 6 | 847.4796 | 141.2466 | 7.738455 | 9.76714E-08 |
| Residual | 293 | 5348 | 18.25256 | | |
| Total | 299 | 6195.479 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 3.620 | 0.890 | 4.067 | 0.000 | 1.868 | 5.372 |
| danT_2014 | 1.395 | 0.239 | 5.839 | 0.000 | 0.924 | 1.865 |
| no export in T0 | -1.185 | 0.913 | -1.297 | 0.196 | -2.982 | 0.613 |
| young firms | 4.276 | 1.588 | 2.693 | 0.007 | 1.152 | 7.400 |
| any Finpro | -1.263 | 0.790 | -1.600 | 0.111 | -2.817 | 0.291 |
| Tekes + Finpro | -0.050 | 0.919 | -0.054 | 0.957 | -1.858 | 1.758 |
| ln(Nempl) | -0.143 | 0.153 | -0.938 | 0.349 | -0.443 | 0.157 |

## Maritime & Offshore – turnover – SMEs (< 250 employees)

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.333906 |
| R Square | 0.111493 |
| Adjusted R Square | 0.091894 |
| Standard Error | 5.365413 |
| Observations | 279 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 6 | 982.569 | 163.7615 | 5.688602 | 1.37508E-05 |
| Residual | 272 | 7830.242 | 28.78765 | | |
| Total | 278 | 8812.811 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 3.337 | 1.181 | 2.826 | 0.005 | 1.012 | 5.661 |
| danT_2014 | 1.387 | 0.301 | 4.606 | 0.000 | 0.794 | 1.979 |
| no export in T0 | -1.491 | 1.150 | -1.297 | 0.196 | -3.755 | 0.773 |
| young firms | 4.468 | 1.999 | 2.236 | 0.026 | 0.534 | 8.403 |
| Tekes + Finpro | 3.185 | 1.181 | 2.697 | 0.007 | 0.860 | 5.510 |
| any Finpro | -0.936 | 1.038 | -0.902 | 0.368 | -2.980 | 1.107 |
| ln(Nempl) | -0.139 | 0.227 | -0.612 | 0.541 | -0.586 | 0.308 |

## Maritime & Offshore – export

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.193854 |
| R Square | 0.037579 |
| Adjusted R Square | 0.018408 |
| Standard Error | 3.92071 |
| Observations | 257 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 5 | 150.6561 | 30.13121 | 1.96014 | 0.085101712 |
| Residual | 251 | 3858.364 | 15.37197 | | |
| Total | 256 | 4009.02 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 2.772 | 0.277 | 9.992 | 0.000 | 2.225 | 3.318 |
| no_export T0 | -3.005 | 1.211 | -2.481 | 0.014 | -5.390 | -0.620 |
| young firms | 1.786 | 1.118 | 1.597 | 0.111 | -0.416 | 3.988 |
| Tekes&Finpro | 0.814 | 0.828 | 0.984 | 0.326 | -0.816 | 2.445 |
| 2+ Finpro | -1.228 | 2.335 | -0.526 | 0.600 | -5.827 | 3.372 |
| N_empl | 0.000 | 0.001 | -0.267 | 0.789 | -0.002 | 0.001 |

## Marine & Offshore – characteristics of used variables

| | 2+ Finpro | 2+ Tekes | Tekes + Finpro | danT_ 2014 | no export in T0 | starter | N_ employed | cum. growth Turnover | cum. growth Export |
|---|---|---|---|---|---|---|---|---|---|
| minimum | 0 | 0 | 0 | -0.90 | 0 | 0 | 0 | 0.00 | 0.00 |
| maximum | 1 | 1 | 1 | 129.73 | 1 | 1 | 4894 | 520.00 | 543.73 |
| average | 0.02 | 0.00 | 0.11 | 0.77 | 0.10 | 0.05 | 112 | 4.83 | 13.29 |
| *dCuT< 40* | 0.02 | 0.00 | 0.11 | 0.29 | 0.10 | 0.04 | 113 | 2.47 | 3.79 |
| median | 0 | 0 | 0 | 0.06 | 0 | 0 | 24 | 1.29 | 1.78 |
| *dCuT< 40* | 0 | 0 | 0 | 0.05 | 0 | 0 | 24 | 1.28 | 1.54 |
| standard deviation | 0.14 | 0.06 | 0.32 | 7.94 | 0.30 | 0.21 | 380 | 30.93 | 48.32 |
| *dCuT< 40* | 0.14 | 0.06 | 0.31 | 1.10 | 0.30 | 0.21 | 382 | 4.08 | 6.07 |

## Arctic seas – turnover

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.452958 |
| R Square | 0.205171 |
| Adjusted R Square | 0.154865 |
| Standard Error | 7.857474 |
| Observations | 85 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 5 | 1259.025 | 251.805 | 4.078481 | 0.00240541 |
| Residual | 79 | 4877.452 | 61.7399 | | |
| Total | 84 | 6136.477 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 5.764 | 2.111 | 2.731 | 0.008 | 1.563 | 9.966 |
| danT_2014 | 4.617 | 1.461 | 3.159 | 0.002 | 1.708 | 7.526 |
| 2+ Tekes | -0.041 | 5.654 | -0.007 | 0.994 | -11.296 | 11.213 |
| Tekes + Finpro | 0.309 | 1.976 | 0.156 | 0.876 | -3.624 | 4.242 |
| young firms | 5.482 | 3.277 | 1.673 | 0.098 | -1.041 | 12.004 |
| N_employed | -0.970 | 0.529 | -1.833 | 0.071 | -2.024 | 0.083 |

## Arctic seas – turnover – using internal programme variables

| *Regression Statistics* | |
|---|---|
| Multiple R | 0,5522 |
| R Square | 0,3049 |
| Adjusted R Square | 0,2586 |
| Standard Error | 6,7556 |
| Observations | 65 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 4 | 1201,217 | 300,304 | 6,580 | 0,00019 |
| Residual | 60 | 2738,301 | 45,638 | | |
| Total | 64 | 3939,518 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 11,78 | 5,16 | 2,28 | 0,03 | 1,46 | 22,11 |
| econ_condition_risk | 11,38 | 5,81 | 1,96 | 0,05 | -0,25 | 23,00 |
| technology_risk | -35,96 | 10,41 | -3,45 | 0,00 | -56,78 | -15,13 |
| resourcing_risk | -17,78 | 8,63 | -2,06 | 0,04 | -35,05 | -0,51 |
| commercial_risk | 20,38 | 10,40 | 1,96 | 0,05 | -0,43 | 41,19 |

## Arctic seas – turnover – using internal programme variables + standard variables

| *Regression Statistics* | |
|---|---|
| Multiple R | 0,528041 |
| R Square | 0,278828 |
| Adjusted R Square | 0,164958 |
| Standard Error | 60,78522 |
| Observations | 67 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 9 | 81426,8174 | 9047,424153 | 2,4486629 | 0,019670017 |
| Residual | 57 | 210606,028 | 3694,842598 | | |
| Total | 66 | 292032,845 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 75,25 | 48,66 | 1,55 | 0,13 | -22,19 | 172,68 |
| 2+ Tekes | 17,35 | 29,32 | 0,59 | 0,56 | -41,36 | 76,05 |
| Tekes + Finpro | 11,17 | 15,98 | 0,70 | 0,49 | -20,83 | 43,17 |
| young firms | -9,15 | 20,24 | -0,45 | 0,65 | -49,69 | 31,38 |
| challenge level | -11,80 | 22,16 | -0,53 | 0,60 | -56,18 | 32,58 |
| econ_condition_risk | -62,79 | 56,36 | -1,11 | 0,27 | -175,66 | 50,07 |
| technology_risk | -107,03 | 83,65 | -1,28 | 0,21 | -274,54 | 60,48 |
| resourcing_risk | -319,10 | 95,20 | -3,35 | 0,00 | -509,74 | -128,46 |
| market_risk | 265,91 | 88,04 | 3,02 | 0,00 | 89,62 | 442,20 |
| N_employed | 0,00 | 0,01 | 0,11 | 0,92 | -0,02 | 0,02 |

## Arctic seas – export

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.465654 |
| R Square | 0.216834 |
| Adjusted R Square | 0.166307 |
| Standard Error | 7.122333 |
| Observations | 67 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 4 | 870.7809 | 217.6952 | 4.291453 | 0.003955448 |
| Residual | 62 | 3145.113 | 50.72763 | | |
| Total | 66 | 4015.894 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 6.509 | 2.253 | 2.890 | 0.005 | 2.006 | 11.012 |
| 2+ Tekes | -0.808 | 3.340 | -0.242 | 0.810 | -7.484 | 5.867 |
| Tekes + Finpro | 1.330 | 1.786 | 0.745 | 0.459 | -2.240 | 4.900 |
| young firms | 6.996 | 2.452 | 2.853 | 0.006 | 2.095 | 11.896 |
| N_employed | -1.055 | 0.525 | -2.008 | 0.049 | -2.104 | -0.005 |

## Arctic Seas – characteristics of used variables

| | any Tekes | any Finpro | 2+ Finpro | 2+ Tekes | Tekes + Finpro | danT_ 2014 | no export in T0 | starter | N_ employed |
|---|---|---|---|---|---|---|---|---|---|
| minimum | 1 | 0 | 0 | 0 | 0 | -0.4372 | 0.0000 | 0 | 0 |
| maximum | 1 | 1 | 1 | 1 | 1 | 3.7794 | 1.0000 | 1 | 5000 |
| average | | 0.5075 | 0.0299 | 0.0746 | 0.4925 | 0.2704 | 0.2090 | 0.209 | 259 |
| *dCuT< 40* | | 0.4921 | 0.0317 | 0.0635 | 0.4921 | 0.1593 | 0.1905 | 0.222 | 275 |
| median | | 1.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0159 | 0.0000 | 0.000 | 47 |
| *dCuT< 40* | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0120 | 0.0000 | 0.000 | 52 |
| standard deviation | | 0.5037 | 0.1715 | 0.2648 | 0.5037 | 0.7652 | 0.4096 | 0.410 | 756 |
| *dCuT< 40* | | 0.5040 | 0.1767 | 0.2458 | 0.5040 | 0.5138 | 0.3958 | 0.419 | 777 |

| | economic risk | technology risk | resourcing risk | market risk | challenge level | cum. growth Turnover | cum. growth Export |
|---|---|---|---|---|---|---|---|
| minimum | 0.000 | 0.200 | 0.200 | 0.200 | 0.000 | 0.03 | 0.00 |
| maximum | 0.800 | 0.600 | 0.600 | 0.800 | 1.000 | 520.00 | 788.71 |
| average | 0.264 | 0.432 | 0.278 | 0.459 | 0.385 | 13.67 | 26.59 |
| *dCuT< 40* | 0.256 | 0.441 | 0.283 | 0.453 | 0.400 | 2.16 | 4.25 |
| median | 0.200 | 0.400 | 0.200 | 0.400 | 0.040 | 1.50 | 1.87 |
| *dCuT< 40* | 0.200 | 0.400 | 0.200 | 0.400 | 0.080 | 1.42 | 1.54 |
| standard deviation | 0.166 | 0.092 | 0.102 | 0.104 | 0.413 | 66.52 | 104.25 |
| *dCuT< 40* | 0.159 | 0.085 | 0.103 | 0.102 | 0.416 | 2.93 | 7.63 |

## Bionets – turnover

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.422487 |
| R Square | 0.178496 |
| Adjusted R Square | 0.115303 |
| Standard Error | 5.934277 |
| Observations | 71 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 5 | 497.3553 | 99.47107 | 2.824627 | 0.022752687 |
| Residual | 65 | 2289.017 | 35.21564 | | |
| Total | 70 | 2786.372 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 2.874 | 1.717 | 1.674 | 0.099 | -0.556 | 6.303 |
| no export in T0 | -5.298 | 2.434 | -2.177 | 0.033 | -10.160 | -0.437 |
| 2+ Tekes | 0.531 | 3.811 | 0.139 | 0.890 | -7.080 | 8.142 |
| young firms | 7.397 | 2.317 | 3.192 | 0.002 | 2.769 | 12.025 |
| Tekes + Finpro | -1.385 | 2.461 | -0.563 | 0.575 | -6.299 | 3.529 |
| ln (N_empl) | -0.245 | 0.404 | -0.608 | 0.546 | -1.052 | 0.561 |

## Bionets – turnover – using internal programme variables + standard variables

| *Regression Statistics* | |
|---|---|
| Multiple R | 0,759 |
| R Square | 0,576 |
| Adjusted R Square | 0,455 |
| Standard Error | 1,696 |
| Observations | 37 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 8 | 109,513 | 13,689 | 4,762 | 0,001 |
| Residual | 28 | 80,498 | 2,875 | | |
| Total | 36 | 190,012 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 1,61 | 2,12 | 0,76 | 0,45 | -2,73 | 5,94 |
| Uusimaa | -1,34 | 0,60 | -2,23 | 0,03 | -2,57 | -0,11 |
| young firms | 1,60 | 0,79 | 2,03 | 0,05 | -0,01 | 3,21 |
| Tekes+Finpro | -1,18 | 0,70 | -1,68 | 0,10 | -2,62 | 0,26 |
| ln(N_empl) | 0,25 | 0,16 | 1,60 | 0,12 | -0,07 | 0,57 |
| resourcing risk | 4,05 | 3,16 | 1,28 | 0,21 | -2,43 | 10,53 |
| economic risk | 8,16 | 2,49 | 3,28 | 0,00 | 3,06 | 13,26 |
| technology risk | -1,75 | 4,64 | -0,38 | 0,71 | -11,25 | 7,74 |
| market risk | -4,21 | 2,55 | -1,65 | 0,11 | -9,44 | 1,02 |

## Bionets – characteristics of used variables

| | any Tekes | any Finpro | 2+ Finpro | 2+ Tekes | Tekes + Finpro | danT_ 2014 | no export in T0 | starter | N_ employed |
|---|---|---|---|---|---|---|---|---|---|
| minimum | 1 | 0 | 0 | 0 | 0 | -0.627 | 0 | 0 | 1 |
| maximum | 1 | 1 | 0 | 1 | 1 | 1.400 | 1 | 1 | 3251 |
| average | | 0.237 | | 0.105 | 0.211 | 0.006 | 0.263 | 0.263 | 377 |
| *dCuT< 40* | | 0.216 | | 0.081 | 0.216 | 0.019 | 0.270 | 0.270 | 388 |
| median | | 0 | | 0 | 0 | -0.058 | 0 | 0 | 33 |
| *dCuT< 40* | | 0 | | 0 | 0 | -0.055 | 0 | 0 | 34 |
| standard deviation | | 0.431 | | 0.311 | 0.413 | 0.355 | 0.446 | 0.446 | 846 |
| *dCuT< 40* | | 0.417 | | 0.277 | 0.417 | 0.355 | 0.450 | 0.450 | 855 |

| | In Uusimaa | economic risk | technology risk | resourcing risk | market risk | cum. growth Turnover | cum. growth Export |
|---|---|---|---|---|---|---|---|
| minimum | 0 | 0.2 | 0 | 0 | 0.371 | 0.30 | 0.01 |
| maximum | 1 | 0.8 | 0.6 | 0.6 | 0.600 | 171.57 | 515.51 |
| average | 0.553 | 0.426 | 0.224 | 0.195 | 0.442 | 6.34 | 17.88 |
| *dCuT< 40* | 0.568 | 0.427 | 0.225 | 0.195 | 0.444 | 1.88 | 2.80 |
| median | 1 | 0.4 | 0.2 | 0.2 | 0.400 | 1.27 | 1.27 |
| *dCuT< 40* | 1 | 0.4 | 0.2 | 0.2 | 0.400 | 1.27 | 1.24 |
| standard deviation | 0.504 | 0.125 | 0.120 | 0.153 | 0.083 | 27.62 | 88.12 |
| *dCuT< 40* | 0.502 | 0.126 | 0.122 | 0.155 | 0.084 | 2.30 | 5.81 |

## Cleanweb – turnover

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.563508 |
| R Square | 0.317542 |
| Adjusted R Square | 0.267361 |
| Standard Error | 15.69738 |
| Observations | 74 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 5 | 7796.292 | 1559.258 | 6.327961 | 7.04191E-05 |
| Residual | 68 | 16755.72 | 246.4077 | | |
| Total | 73 | 24552.01 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* |
|---|---|---|---|---|---|
| Intercept | -1.056 | 4.167 | -0.253 | 0.801 | -9.370 |
| danT_2014 | 0.939 | 2.501 | 0.375 | 0.709 | -4.052 |
| young firms | 35.714 | 6.700 | 5.331 | 0.000 | 22.345 |
| 2+ Tekes | -5.497 | 10.248 | -0.536 | 0.593 | -25.947 |
| Tekes + Finpro | 2.455 | 5.392 | 0.455 | 0.650 | -8.305 |
| ln(Nempl) | 1.129 | 1.138 | 0.992 | 0.325 | -1.142 |

## Cleanweb – turnover – using internal programme variables + standard variables

| *Regression Statistics* | |
|---|---|
| Multiple R | 0,634634 |
| R Square | 0,402761 |
| Adjusted R Square | 0,264936 |
| Standard Error | 3,450869 |
| Observations | 49 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 9 | 313,199 | 34,800 | 2,922 | 0,00957 |
| Residual | 39 | 464,431 | 11,908 | | |
| Total | 48 | 777,630 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 3,056 | 2,954 | 1,035 | 0,307 | -2,918 | 9,031 |
| no export in T0 | -2,628 | 1,376 | -1,909 | 0,064 | -5,412 | 0,156 |
| any Finpro | -0,630 | 1,319 | -0,478 | 0,636 | -3,298 | 2,038 |
| in uusimaa | 1,375 | 1,169 | 1,177 | 0,246 | -0,989 | 3,739 |
| young firms | 1,766 | 1,112 | 1,588 | 0,120 | -0,483 | 4,016 |
| economic risk | 3,958 | 3,843 | 1,030 | 0,309 | -3,815 | 11,731 |
| technology risk | -2,994 | 4,985 | -0,601 | 0,552 | -13,077 | 7,090 |
| resourcing risk | -23,107 | 6,080 | -3,800 | 0,000 | -35,405 | -10,808 |
| market risk | 11,556 | 5,481 | 2,108 | 0,041 | 0,470 | 22,642 |
| N_employed | 0,000 | 0,001 | 0,122 | 0,903 | -0,002 | 0,002 |

## Cleanweb – export

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.4024 |
| R Square | 0.1619 |
| Adjusted R Square | 0.0455 |
| Standard Error | 9.0130 |
| Observations | 42 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 5 | 564.8874 | 112.9775 | 1.390774 | 0.250902084 |
| Residual | 36 | 2924.408 | 81.23355 | | |
| Total | 41 | 3489.295 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* |
|---|---|---|---|---|---|---|
| Intercept | 6.291 | 3.568 | 1.763 | 0.086 | -0.944 | 13.527 |
| danT_2014 | -1.148 | 1.970 | -0.583 | 0.564 | -5.143 | 2.847 |
| young firms | 8.069 | 5.764 | 1.400 | 0.170 | -3.621 | 19.758 |
| 2+ Tekes | -7.125 | 5.934 | -1.201 | 0.238 | -19.159 | 4.909 |
| Tekes + Finpro | 7.376 | 3.548 | 2.079 | 0.045 | 0.180 | 14.573 |
| ln(Nempl) | -0.779 | 0.883 | -0.882 | 0.383 | -2.571 | 1.012 |

## Cleanweb – characteristics of used variables

| | any Tekes | any Finpro | 2+ Finpro | 2+ Tekes | Tekes + Finpro | danT_ 2014 | no export in T0 | starter | N_ employed |
|---|---|---|---|---|---|---|---|---|---|
| minimum | 1 | 0 | 0 | 0 | 0 | -0.755 | 0 | 0 | 0 |
| maximum | 1 | 1 | 1 | 1 | 1 | 5.000 | 1 | 1 | 4080 |
| average | | 0.315 | 0.073 | 0.055 | 0.315 | 0.381 | 0.2 | 0.333 | 171 |
| *dCuT< 40* | | 0.320 | 0.078 | 0.059 | 0.320 | 0.387 | 0.196 | 0.3 | 183 |
| median | | | | | | 0.104 | | | 21 |
| *dCuT< 40* | | | | | | 0.099 | | | 26 |
| standard deviation | | 0.47 | 0.26 | 0.23 | 0.47 | 0.957 | 0.404 | 0.476 | 585 |
| *dCuT< 40* | | 0.47 | 0.27 | 0.24 | 0.47 | 0.995 | 0.401 | 0.463 | 607 |

| | In Uusimaa | economic risk | technology risk | resourcing risk | market risk | cum. growth Turnover | cum. growth Export |
|---|---|---|---|---|---|---|---|
| minimum | 0 | 0 | 0.2 | 0 | 0.2 | 0.11 | 0.04 |
| maximum | 1 | 0.6 | 0.6 | 0.4 | 0.6 | 132.93 | 57.54 |
| average | 0.370 | 0.315 | 0.400 | 0.248 | 0.448 | 8.17 | 7.65 |
| *dCuT< 40* | 0.36 | 0.316 | 0.400 | 0.252 | 0.452 | 3.43 | 5.37 |
| median | | 0.4 | 0.4 | 0.2 | 0.4 | 1.50 | 2.01 |
| *dCuT< 40* | | 0.4 | 0.4 | 0.2 | 0.4 | 1.48 | 1.90 |
| standard deviation | 0.487 | 0.163 | 0.103 | 0.095 | 0.102 | 20.61 | 12.26 |
| *dCuT< 40* | 0.485 | 0.162 | 0.107 | 0.097 | 0.105 | 5.63 | 7.23 |

# ANNEX 4. COMPARING REALIZED AND EXPECTED TURNOVER

The results for comparing realized and expected turnover are shown in the table below by applying the assumption that the expected turnover in year T equals the observed turnover of the previous year (T-1) corrected for the difference between the expected turnover of the new activity in the considered year (T) and the previous year (T-1). In other words, starting from year T-1 (often the year at the end of the project or the following year) all the growth in turnover of the company would be contained by the new activity. As can be seen in Table 11 in many cases the deviations from the hypothesized equation are large, whereas also quite often the expected new turnover is large compared to the existing turnover of the company. All in all, this analysis indicates that the expected turnover is not a good indicator for realized performance for the purpose of ex-post evaluation.

TABLE 11. Comparing realized and expected turnover as performance indicators (turnover in million €).

| Turnover 2018 | Expected* turnover 2018 | % deviation | Turnover 2019 | Expected turnover 2019 | % deviation |
|---|---|---|---|---|---|
| 9,7 | 10,7 | -11 % | 9,8 | 12,7 | -30 % |
| 9,4 | 9,8 | -4 % | 6,8 | 12,3 | -81 % |
| 0,1 | 4,6 | -4005 % | 0,0 | 9,6 | -23895 % |
| 48,0 | 41,0 | 15 % | 44,4 | 41,0 | 8 % |
| 0,4 | 0,7 | -105 % | 0,4 | 1,2 | -216 % |
| 2273,7 | 2262,0 | 1 % | 2220,7 | 2262,1 | -2 % |
| 5,2 | 2,6 | 51 % | 9,5 | 2,6 | 73 % |
| 3,4 | 2,7 | 20 % | 4,1 | 2,8 | 31 % |
| 44,1 | 31,6 | 28 % | 39,1 | 31,9 | 19 % |
| 1,4 | 2,6 | -78 % | 1,6 | 5,6 | -256 % |
| 6,1 | 4,5 | 27 % | 15,2 | 4,7 | 69 % |
| 0,3 | 0,2 | 39 % | 0,4 | 0,3 | 14 % |
| 0,2 | 0,1 | 57 % | 0,1 | 0,2 | -46 % |
| 29,1 | 25,0 | 14 % | 28,5 | 27,2 | 4 % |
| 3,1 | 3,9 | -25 % | 3,2 | 4,2 | -32 % |
| 1,3 | 1,4 | -12 % | 1,0 | 1,7 | -73 % |
| 13,8 | 25,7 | -86 % | 13,3 | 26,7 | -101 % |
| 0,4 | 0,3 | 41 % | 0,7 | 0,3 | 54 % |
| 2484,0 | 2217,1 | 11 % | 2318,0 | 2217,9 | 4 % |
| 217,7 | 203,7 | 6 % | 147,9 | 206,7 | -40 % |
| 0,2 | 0,2 | 16 % | 0,1 | 0,2 | -26 % |
| 9,6 | 2,2 | -246 % |  | 5,0 | % |
| 0,0 | 0,0 | 100 % | 0,7 | 110,9 | -15173 % |
| 0,1 | 0,0 | 100 % | 0,0 | 1,2 | -3224 % |
| 19,5 | 22,3 | -15 % | 17,9 | 24,3 | -36 % |
| 0,1 | 0,9 | -661 % | 0,2 | 1,9 | -1025 % |
| 0,9 | 2,1 | -139 % | 0,4 | 3,1 | -727 % |
| 0,9 | 1,1 | -22 % | 1,0 | 1,4 | -40 % |
| 0,1 | 1,0 | -984 % | 0,1 | 4,5 | -5079 % |
| 1,1 | 7,8 | -584 % | 2,1 | 21,6 | -926 % |
| 0,1 | 0,1 | -47 % | 0,2 | 0,2 | -18 % |
| 0,0 | 7,0 | -700452 % | 0,0 | 16,5 | -1650359 % |
| 0,0 | 0,3 |  | 0,0 | 2,7 |  |

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