



# Financing SDG Transformations

Experiences from four sustainable  
finance pilot ecosystems

Offshore wind power

Sustainable protein

Climate smart water solutions

Vocational education

This report is a deliverable of the project “Developing Finland’s Sustainable Finance Ecosystems”.

# A Toolkit for Mobilising SDG-aligned Investments

*Experiences from four sustainable finance pilot ecosystems*

*Offshore wind power*

*Sustainable protein*

*Climate smart water solutions*

*Vocational education*

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Solar Water Solutions



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# Johdanto

YK:n kestävän kehityksen tavoitteiden saavuttaminen tällä vuosikymmenellä edellyttää merkittäviä muutoksia siihen, miten julkinen ja yksityinen sektori kohdentavat investointejaan.

Useat kansalliset ja kansainväliset aloitteet pyrkivät tukemaan finanssialan murrosta ja edistämään rahoituksen kokonaisvaltaista suuntaamista kestävän kehityksen tavoitteiden mukaisesti. EU on osoittanut merkittävää johtajuutta ja samanaikaisesti useat maat ovat laatineet kansallisia strategioita ja ohjelmia kestävän rahoituksen systemaattiseksi edistämiseksi.

Suomi käynnisti työn kestävämmän rahoitusjärjestelmän edistämiseksi jo vuosina 2018–2019. Vuodesta 2020 vauhti on kiihtynyt osana komission rahoittamaa hanketta “Developing Finland’s Sustainable Finance Ecosystem”, jonka puitteissa Suomelle on laadittu syksyllä 2021 julkaistu kestävän rahoituksen kansallinen tiekartta.

Tiekartta (Finnish Roadmap for Financing a Decade of SDG Action) tarjoaa suuntaviivoja suomalaisille toimijoille viedä käytäntöön tarvittavia muutoksia. Se tarjoaa mahdollisuuden eri toimijoille tunnistaa oman roolinsa kestävän rahoituksen edistämiseksi ja tehdä tarvittavia muutoksia mandaatteihinsa ja/tai toimintatapoihinsa.

Tiekartan toimeenpanon vauhdittamiseksi vuosina 2021–2022 rahoituksen pullonkauloja sekä ratkaisuja on tunnistettu neljässä temaattisessa rahoitusekosysteemissä, tiiviissä yhteistyössä keskeisten sidosryhmien kanssa (luku 1). Tämä raportti kokoaa yhteen tärkeimmät opit näistä neljästä ekosysteemistä, jotka pyrkivät löytämään ratkaisuja keskeisten kestävyysmurrosten rahoittamiseksi – tunnistuen tarpeen merkittäville kestävyysmurroksille niin Suomessa kuin maailmallakin.

Tämä raportti kuvaa neljän, hyvin erilaisen ekosysteemin rahoitusproblematiikan, esittelee prosessin, miten näitä haasteita voidaan lähteä ratkaisemaan ja tarjoaa suosituksia merituulivoiman (luku 2) ja kestävän proteiinituotannon (luku 3) skaalaamiseen Suomessa sekä ilmastoälykkäiden vesiratkaisujen (luku 4) ja ammatillisen koulutuksen (luku 5) kansainvälistymiseen.

Vaikka tarkastelu fokusoituu rahoitukseen, lähestymistapa pyrkii tunnistamaan myös olennaiset muut toimintaympäristön avaintekijät, koska kestävän rahoituksen mobilisoinnin haaste ei aina kilpisty puhtaasti rahoituksen puutteeseen. Usein rahoitusta suurempana ongelmana voi olla markkinaymmärryksen puute tai liiketoimintamallien rajallinen kyky tuottaa sekä SDG-vaikuttavuutta että kannattavuutta. Joissain tapauksissa esteenä SDG-ratkaisujen skaalaamiselle on toimijoiden haluttomuus tai taitamattomuus kantaa kestävyysmurrokseen liittyvää riskiä, sen kirrellisyydestä ja/tai merkittävästä vaikuttavuus potentiaalista huolimatta. Tästä syystä raportissa pyritään kuvaamaan kestävän rahoituksen pilottiekosysteemien rakentamisen prosessi ja keskeiset elementit tavalla, joka auttaa jatkossa jalostamaan kyseisiä ekosysteemejä tehokkaina kokonaisuuksina.

Pilottien kokemuksista on tehty yhteenveto, ja päätelmiä rahoitusekosysteemeille yhteisistä toimintatavoista ja haasteista, joihin tarvittaisiin mahdollistavia ratkaisuja. Työn vaiheistus ja elementtien sisällön kuvaaminen auttavat hyödyntämään oppeja myös muissa tämän vuosikymmenen elintärkeissä kestävyysmurroksissa - joiden rahoitushaasteet edellyttävät

saumatonta yhteispeliä yksityisen, julkisen ja kolmannen sektorin välillä, niin Suomessa kuin maailmalla.

Raportin tarjoama lähestymistapa ja prosessi voi tarjota konkreettisen työkalun ja manuaalin kestävämmän rahoituksen mobilisointiin, jota EU:n komissio pyrkii kokonaisvaltaisesti edistämään. Keskeinen mahdollistaja raportin tulosten kannalta on ollut tiivis yhteistyö, jota on tehty neljän pilottiekosysteemin sisällä ja kesken. Analyysin tuloksia on tuotu kansallisten työpajojen ruodittavaksi ja satoja asiantuntijoita ja sidosryhmiä on myös kuultu, samoin kansainvälisiltä edelläkävijöiltä haettu oppeja ja esimerkkejä hyvistä käytännöistä. Työn tuloksista iso kiitos kuuluu työhön aktiivisesti osallistuneille tahoille Suomessa ja ulkomailla, erityiskiitos pilottiekosysteemien puheenjohtajille ja jäsenille, sekä hankkeen kansalliselle koordinaatioryhmälle.

Toivomme että raportin havainnot ja suositukset voivat tukea Suomessa käynnissä olevia kestävyysmurroksia, erityisesti auttaen rahoituskentän epäjatkuroiden poistamiseen sekä suuntaamaan jatkossa rahoituksen nykyistä kestävämmiin. Kesällä 2022 päättyvän hankkeen puitteissa työn keskeisiä oppeja kootaan yhteen keväällä 2022 ja viestitään aktiivisesti asiasta kiinnostuneille Suomessa ja kansainvälisesti.



## Executive summary

The overall objective of the EU-funded Project “Developing Finland’s Sustainable Finance Ecosystems” is to contribute to increasing financing for ecosystems that provide solutions to the Sustainable Development Goals (SDGs) in Finland and globally, and in which Finland has strong expertise. The project supports national authorities, beneficiary institutions, and stakeholders in deploying and harmonising sustainable finance practices and identifying solutions on how to enhance information exchange, better coordinate their activities, and share lessons learned.

In parallel to finalizing and launching the [\*Finnish Roadmap for Financing a Decade of SDG Action 2021\*](#), the project has during 2021 focused on four pilot ecosystems, with the aim to concretely identify bottlenecks and solutions for mobilising SDG aligned investments. The purpose of this Report (Deliverable 3, D3) is to present the **key findings and recommendations from extensive work conducted within the four SDG finance pilot ecosystems in Finland in 2021**.

**The SDG finance approach and tools in Finland have been founded on two central building blocks**, with the aim to help create financing ecosystems that can produce investment pipelines of high-quality projects supporting the SDGs, that identify and serve suitable types and sizes of SDG (and EU Taxonomy) aligned finance, that help manage those investments credibly and successfully, and that can transparently report and communicate the achieved SDG impacts and profits.

**Firstly, the Roadmap has provided the overall framework for defining key elements that need to be in place to tackle the SDG finance gap at the required scale and pace.** The Roadmap provides a screening tool for understanding, analyzing and defining the SDG-alignment status of a finance ecosystem. It provides a national framework for bringing relevant key stakeholders together, from public, private, civil society, and research, in order to understand their respective roles in transforming the finance system in a region / country.

**Secondly, the process for defining and analysing the pilot ecosystems, in collaboration with the key ecosystem stakeholders, provides the essential component of the toolkit for putting things into action.** The “deep dives” into the four pilot ecosystems, together with knowledge holders, investors, and relevant public sector stakeholders, has allowed identify more specifically which kinds of financing modalities and instruments are needed, and who should take the lead in concretely addressing identified barriers and bottlenecks. Working within the ecosystems, closely with key ecosystem stakeholders, has also been central in building required commitment as well as capacity for putting the recommendations into action.

**In total, 46 recommendations have been elaborated within the four Finnish pilot ecosystems.** In addition to the core pilot ecosystem stakeholders, a wider group of stakeholders have been engaged through national workshops, bilateral consultations, and national and international interviews, in order to integrate lessons learned and experiences from forerunners and peers.



The ecosystems were chosen with the objective of learning from a range of different themes. Hence it is not surprising that **many of the recommendations are addressing ecosystem specific bottlenecks**. However, it is important also to note that several challenges in the Finnish SDG finance system are cross-cutting. Hence through successful implementation of selected recommendations, **certain common bottlenecks can be addressed cost-efficiently, strengthening the SDG mobilization potential of all the four pilot ecosystems**, also very likely boosting SDG aligned investments in other priority themes during this decade.

The recommendations **provide a comprehensive plan of action for accelerating SDG aligned finance through these pilot ecosystems**. The action plan contains initial timelines and phasing of required measures, with some of the recommendations being proposed for immediate action (during project period, continuing until June 2022), some for action during /by end 2022, and some to be addressed within the period of the next government programme (2023 onwards).

In order to further help uptake and **implementation of the recommended actions**, during **early 2022 the project will focus** on i) **refining and communicating the recommendations** and facilitate information exchange and coordination between key partners, and on ii) **compiling and refining the main lessons learned from the pilot ecosystems**, with the view to help apply and tailor the recommended actions across ecosystems more broadly in Finland, while also sharing lessons learned to help scale up SDG finance more widely by EU peers and other international partners.

## Acronyms and abbreviations

BOP	Balance of plants
CAP	The EU Common Agriculture Policy
CEF	The Connecting Europe Facility
CPI	Climate Policy Initiative
DevPlat	Developing Markets Platform
DFCD	Dutch Fund for Climate & Development
DNSH	Do No Significant Harm
DRR	Drought and disaster risk reduction
EEAS	European External Action Service
EEP	Energy and Environment Partnership
EFSA	European Food Safety Authority
EIB	European Investment Bank
EIC Accelerator	European Innovation Council Accelerator
EIF	European Investment Fund
EIT FAN	EIT Food Accelerator Networks
FAO	Food and Agriculture Organization
FCA	Finn Church Aid
FCAI	Finn Church Aid Investments
FMI	The Finnish Meteorological Institute
FMO	Dutch entrepreneurial development bank
FTE	Forecast to full time employed
GHG	Greenhouse Gas
GIS	Geographical Information System
HFC	hydrofluorocarbon
IF	The Innovation Fund
InvestEU	The InvestEU Programme
KPI	Key Performance Indicator
MDB	Multilateral Development Banks
NDICI	Neighbourhood, Development and International Cooperation Instrument
NEFCO	Nordic Environment Finance Corporation

NGO	Non-governmental organization
NIB	Nordic Investment Bank
NIS	Network Information System
NWFF	National water financing facility
O&M	Operations and maintenance
OWF	offshore wind farms
PIF	The Public Sector Investment Facility
PLA	polylactic acid
PPA	Power Purchase Agreement
PPF	project preparation facility
PPP	public-private-partnership
RDI	Research, Development and Innovation
RRF	EU Recovery and Resilience Facility
SDG	Sustainable Development Goal
SIB	Social Impact Bond
SME	Small and medium-sized enterprise
SPC	Soy Protein Concentrate
SPV	special purpose vehicles
TA	Technical Assistance
TRL	Technology Readiness Level
TVET	technical and vocational education and training
VET	vocational education and training
WASH	water, sanitation and hygiene
WEFFI	Worldwide Educating for the Future Index
WFF	Water Financing Facility
WWFF	World Water Financing Facility

# 1. Introduction

## 1.1 Pilot finance ecosystems for accelerating mobilisation of SDG finance

The overall objective of the EU-funded Project “Developing Finland’s Sustainable Finance Ecosystems” is to contribute to increasing financing for ecosystems that provide solutions to the Sustainable Development Goals (SDGs) in Finland and globally, and in which Finland has strong expertise. In parallel to finalizing and launching the [Finnish Roadmap for Financing a Decade of SDG Action 2021](#),<sup>2</sup> the project has during 2021 focused on four pilot ecosystems, with the aim to concretely identify bottlenecks and solutions for mobilising SDG aligned investments.

The SDG finance roadmap provides a national framework and strategic guidance for Finnish policy makers, for ownership steering and SDG finance stakeholders in Finland overall. The pilot ecosystems have allowed to analyse in more detail the required changes in the Finnish finance ecosystems and engage key stakeholders for building capacity and commitment for boosting necessary transformations in SDG finance.

The four pilot ecosystems were selected through a transparent and participatory process in late 2020 – early 2021, with the aim to learn as much as possible from different kinds of ecosystems. The work in four different ecosystems has enabled the identification of financing bottlenecks and solutions from various perspectives, taking note of differences in market focus, types of SDG solutions and impacts targeted, maturity of SDG products and services within the finance ecosystems, level of turnover and size of key actors within the ecosystem as well as type and mandate of funding agencies and investors (Figure 1).<sup>3</sup>



Figure 1. The four pilots address SDG challenges of national and international relevance.

This chapter describes the approach and focus of work conducted in 2021 with the pilot ecosystem core groups, as well as how a wider group of stakeholders, including national and international peers and experts, have been engaged. The four pilots have been presented in more detail in chapters 2-5, with each chapter detailing the processes, participants, the particular analyses conducted as well as the main outcomes of each pilot ecosystem.

Work organized within four pilot ecosystems has helped define in more detail what kind of bottlenecks are of particular concern for different kinds of SDG investments, and how best

<sup>2</sup> Sustainable Development Goals Finance Roadmap - Finnish Roadmap for Financing a Decade of SDG Action 2021. Available at <https://tem.fi/en/developing-finlands-sustainable-finance-ecosystems>

<sup>3</sup> The selection process and criteria are presented in more detail in previous project report, Deliverable 2 (D2).

to address those challenges (Figure 2) in order to help mobilise required SDG aligned investments during this decade.

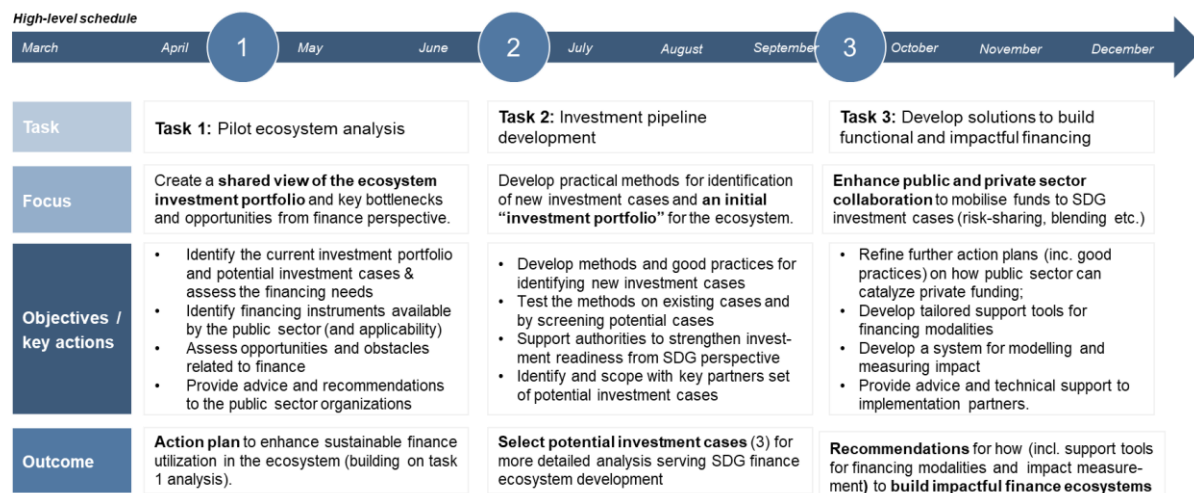


Figure 2. Workplan for the SDG finance pilot ecosystems including three key tasks in 2021.

Throughout the process, information and lessons learned have been shared between the pilot ecosystems, noting among other that some of the bottlenecks, as well as solutions, are common, while a number of solutions must be tailored based on the specific SDG financing needs within that particular ecosystem (see also chapter 6). While the focus of work has been on supporting public sector efforts and approaches that help mobilize expertise and financing for SDG aligned solutions, private sector stakeholders and NGOs have been actively engaged, as the ultimate objective is to mobilise finance, in particular private finance, required to reach the SDGs during this decade.

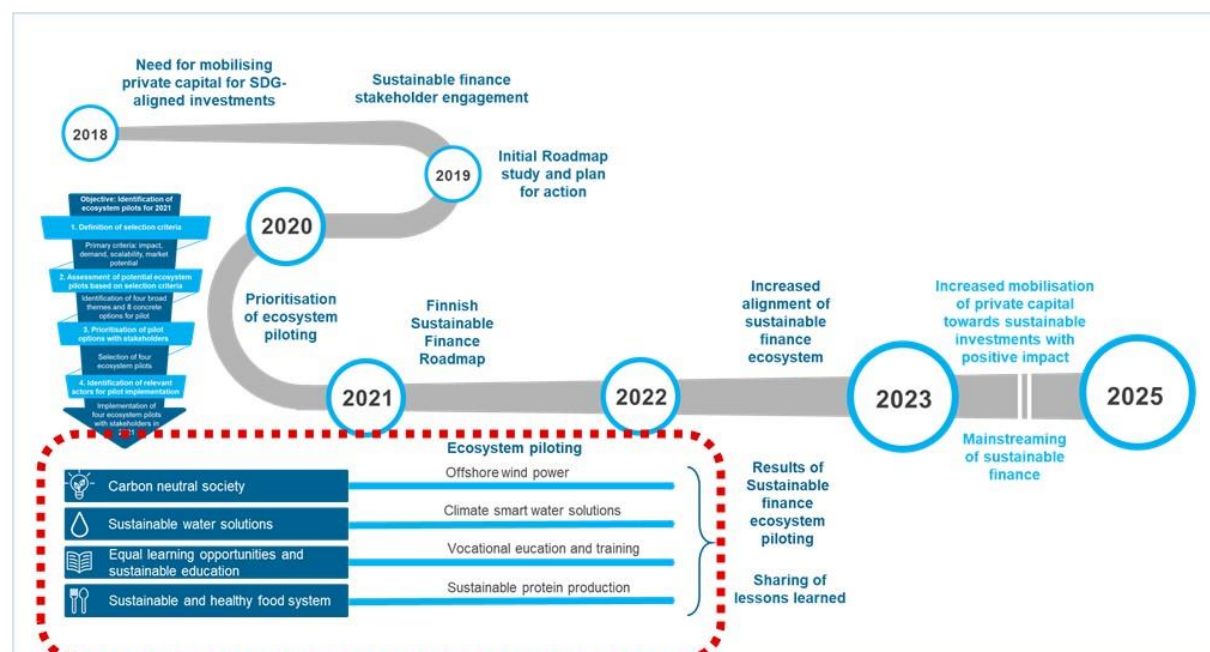


Figure 3. The pilots tackle SDG challenges of national & international relevance, and help define more detailed actions needed within different kinds of ecosystems to accelerate the mobilisation of SDG aligned investments.

## 1.2 Approach and methodologies for pilot ecosystem work

### Recognising and putting in place the key ingredients of an SDG finance toolkit

This project should within the foreseeable future help create finance ecosystems that measurably mobilize private financing for SDG solutions with Finnish value added, and during this decade help scale-up the required SDG financing (

Figure 3). In parallel, this initiative aims to build knowledge that can serve other EU Member States and partner countries, noting the common challenges. Hence, the work with the Finnish SDG finance ecosystem, including the national roadmap as well as the work within four pilot ecosystems, has been conducted, structured, and reported in a manner that hopefully contributes to systematic learning and sharing of good practices.

This has been achieved by building the work on **two central elements** developed and put into practice during this project. **Firstly**, the National SDG Finance Roadmap 2021 provides an overall framework for defining the key elements that need to be addressed and be in place in order to tackle the SDG finance gap and mobilise private finance at required scale. Hence, the roadmap and its key elements provides a screening tool for understanding, analysing, and defining the SDG-alignment status of a finance ecosystem (Figure 4). It allows different stakeholders to recognize their respective roles and the required partnerships for mobilising SDG aligned investments. Several other countries and jurisdictions have recently developed or are in the process of developing their respective taxonomies and/or sustainable finance roadmaps, with somewhat varying focus (some focussing on green finance, other more broadly on SDG finance, some specifically focussing on the finance sector and its role within the broader transformation).<sup>4</sup>

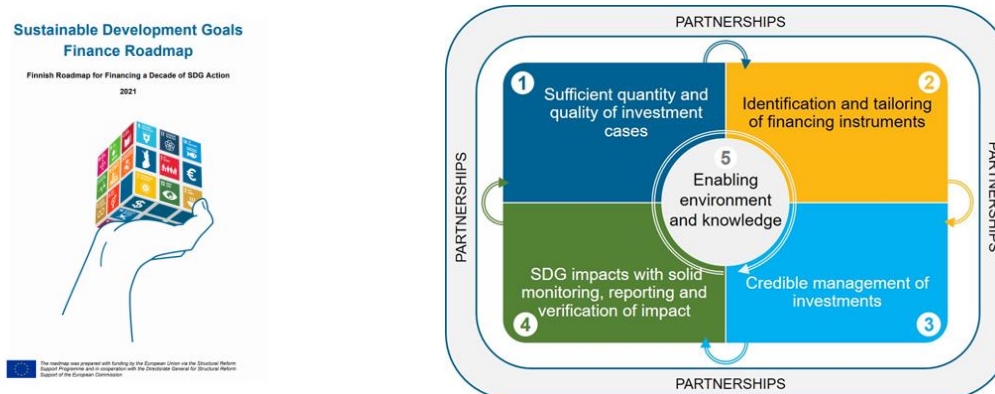


Figure 4. The roadmap (cover page to the left, launched in 2021) process and its key elements (to the right) provide the basis for analysing the current status of the SDG finance ecosystem in Finland. It helps to conduct a systematic analysis of the main elements, their potential to deliver SDG finance. It also allows various stakeholders to recognize their respective roles in aligning all finance with the SDGs.

<sup>4</sup> See for example OECD and its [Centre on Green Finance and Investment](#), the 2020 publication [Developing Sustainable Finance Definitions and Taxonomies](#) or work by Future of Sustainable Data Alliance ([FoSDA](#))

**Secondly**, the pilot ecosystem process developed and piloted during this project for defining and analysing various pilot ecosystems provides the second essential component of the approach applied. The tailoring and “deep dive” into the four pilot ecosystems, together with knowledge holders, investors and relevant public sector stakeholders, has allowed identifying more specifically which kinds of financing modalities and instruments are needed.

Jointly, these two building blocks form a synergetic approach and a toolkit for advancing SDG aligned finance on a national level, and in particular through concrete action within thematic, SDG aligned finance ecosystems. The process and steps, as described in Figure 5, and systematically applied during pilot ecosystem work (see chapters 2-5), has allowed to deliver coherent analysis, allowing comparability between different ecosystems as well as demand driven recommendations.

In line with the lessons learned from the national roadmap process (initiated originally in 2019, see

Figure 3), as well as the work within the four pilot ecosystems, financing modalities and instruments should not be analysed in isolation of the other key elements of the roadmap. The work with the four pilot ecosystems during 2021 has, among others, revealed the importance of addressing regulative barriers and other enabling environment challenges, and/or knowledge/capacity/skills barriers which in some ecosystems may be more pressing than in others, and in some cases no financial instruments per se can help mobilise private SDG aligned finance unless some of these other (a priori “non-financial”) barriers have been addressed. For example, the pilot ecosystem on offshore wind power (see chapter 2) highlights such barriers quite explicitly as preconditions for mobilising investments that deliver both sustainable profit and SDG impact. International studies also reveal that water and sanitation as well as education solutions overall, represent sectors with difficulties to mobilise private finance.<sup>5</sup> The following chapters present in detail the key findings and recommendations from work within the four pilot ecosystems.

### **Forming pilot ecosystems, engaging key stakeholders, and building capacity**

As noted above, the work within the pilot ecosystems has been conducted in a stepwise and systematic manner, with the aim to allow distilling lessons learned and promote the duplication of ecosystem work also in other sectors, and possibly also other countries too. Figure 5 highlights key steps and ingredients of work conducted within the pilot ecosystems.

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<sup>5</sup> Mobilising institutional investors for financing sustainable development in developing countries, [OECD 2021](#)



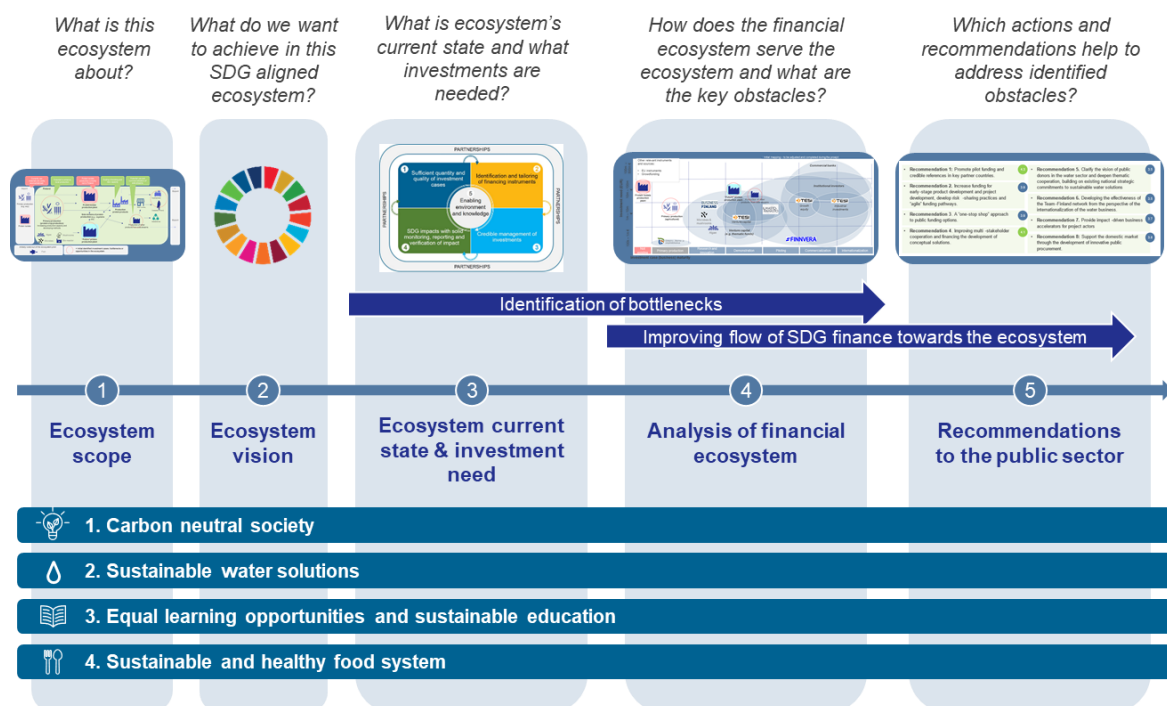


Figure 5. Visualisation of the key elements and phases of pilot ecosystem work

As noted earlier, the four pilot ecosystems were selected through a participatory process and an integral part of this process was identifying a “home base” (or “owner”) for each pilot. This implementation partner, body or organization of the public sector has been key for anchoring the work of the pilot ecosystems and building ownership and continuity for pilot ecosystem development. Transparency in engaging a group of key stakeholders into the ecosystem core group has been central to ensure access to insights by public and private sector stakeholders as well as NGOs, and stepwise build informed ecosystem analysis and develop recommendations for broader stakeholder consultations and engagement (Figure 6 presents the roles of key stakeholders in the pilot for *Carbon neutral society, with a focus on offshore wind power*). The roles of different stakeholders have been openly communicated throughout the process, with implementation partners for pilot ecosystems presented in Annex I.

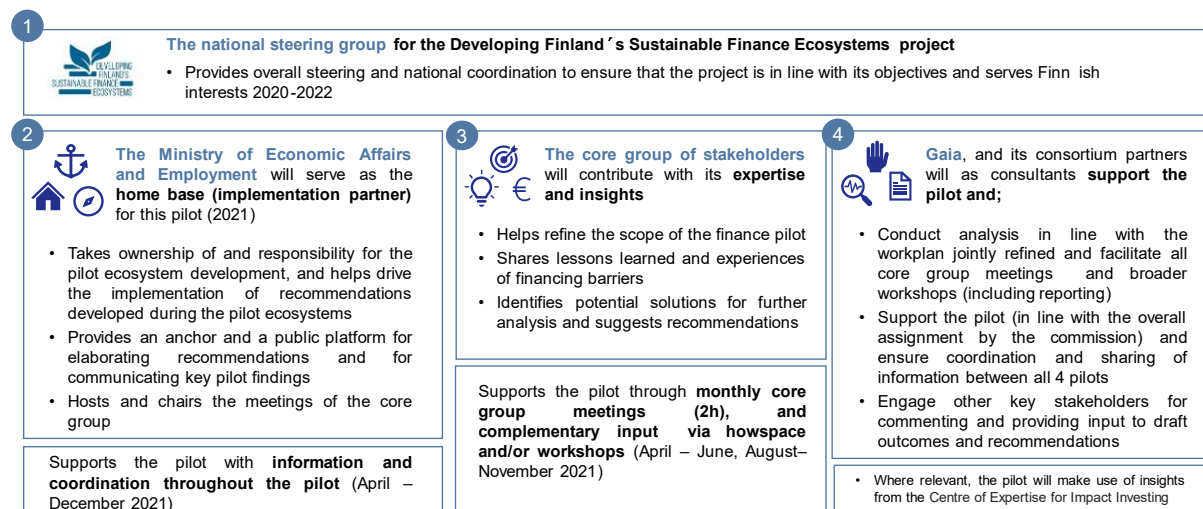
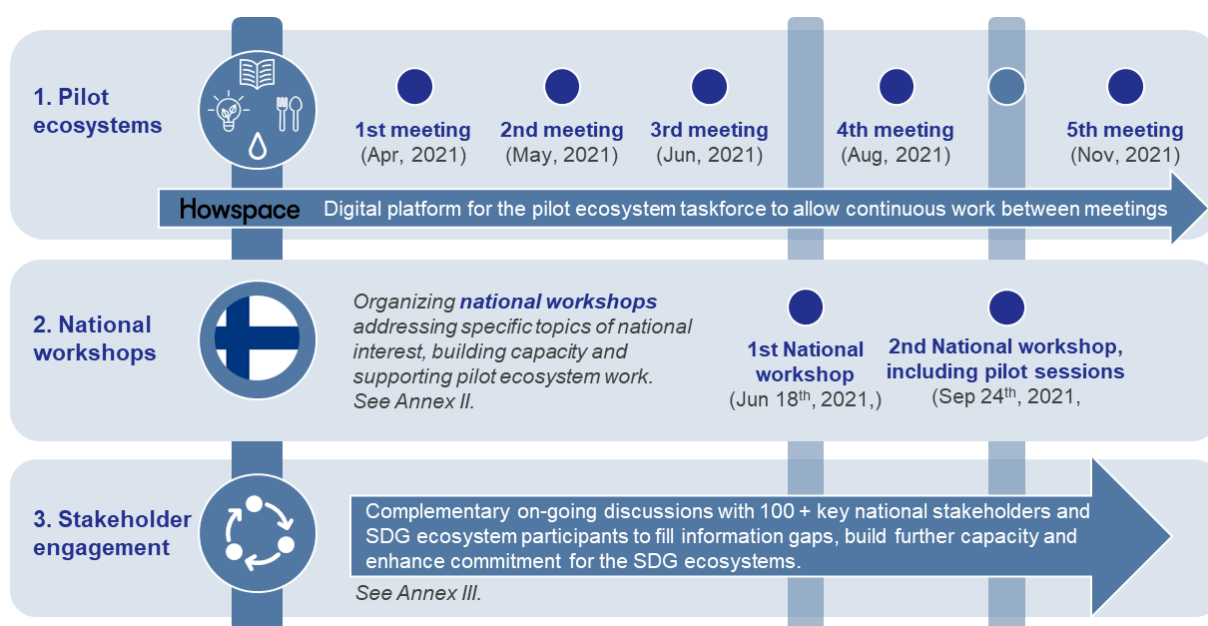


Figure 6. Roles of key stakeholders in each pilot ecosystem – case Carbon neutral society, with focus on offshore wind power in Finland. The transparency and clarity of roles and expectations has been central in successfully

*developing pilot ecosystems, engaging key stakeholders, identifying key recommendations and building capacity and commitment.*

In line with the overall project goals, the recommendations defined for each of the pilot ecosystems have been geared for public sector stakeholders, identifying efforts and approaches the public sector can take to help mobilize expertise and financing for SDG aligned solutions – in Finland and internationally (chapter 2.7, 3.7, 4.7 and 5.7). However, as highlighted by the national SDG finance roadmap and its main elements, and the broad stakeholder participation witnessed throughout the work on pilot ecosystems, the mobilization of SDG aligned investments can only happen through partnerships with the private sector and civil society, and when boosted by appropriate enabling environments.

Hence while the pilot ecosystem core groups/ task forces have served to provide in-depth guidance, broader stakeholder input has been constantly sought through numerous bilateral parallel consultations, interviews with international experts as well as through national stakeholder workshops. This has been done with a view to facilitate the mobilisation of responsible private sector expertise and finance, and hence to build commitment and capacity for a major transformation in finance allocations during this decade. Figure 7 summarises the work of the pilot ecosystems as well as the broader stakeholder engagement during 2021 with more detailed information available in Annexes I, II and III.



*Figure 7. The work has been implemented in a manner to engage all key stakeholders and build commitment as systematically as possible. The building of capacity has been integral to all project tasks and activities, including 20 pilot ecosystem meetings with the core group stakeholders, national workshops specifically aimed at building capacity and commitment. In addition, numerous bilateral discussions have been conducted in 2021 to share information, fill information gaps and help build capacities.*

## SDGs as the overriding framework for transforming the finance sector

Finland is at the forefront of many international sustainability comparisons and close to reaching many of the SDGs, particularly related to social and economic sustainability.<sup>6</sup>

<sup>6</sup> <https://valtioneuvosto.fi/en/-/10616/finland-ranks-first-in-international-sustainable-development-comparison>

However, major challenges linked to climate neutrality, biodiversity loss and the unsustainable global ecological and social footprint of Finnish consumption require “SDG transformation investments” to ensure Finland lives up to its Agenda2030 commitment. Some of these challenges are being tackled within the pilot ecosystems focusing on **offshore wind power** as well as **sustainable protein production** in Finland (see chapters 2 and 3). Simultaneously SDG aligned finance ecosystems do allow Finland to better bear its global responsibility and provide Finnish SDG solutions of value-added internationally. The possibility to contribute to these global challenges is at the core of the pilot ecosystems focusing on **climate smart water solutions** and **vocational education** in emerging countries (see chapters 4 and 5).

The pilot ecosystem approach, including creating finance ecosystems with an SDG vision, (taking note of EU Taxonomy development and how it can help boost this transition), and defining the main objectives together with the key stakeholders of that particular ecosystem, forms the basis for developing practical methods for assessing and reporting SDG impacts. As noted by multiple international reviews<sup>7</sup> and highlighted in the Finnish SDG Finance roadmap, one of the areas in need of coordinated development is SDG impact measurement. The work within pilot ecosystems, has confirmed the need to support public funding agencies as well as solutions providers (including start-ups, SMEs, bigger companies, NGOs etc.) to better understand, refine and disclose their SDG impacts. Within each pilot ecosystem suitable SDG impact monitoring approaches have been screened and initial suggestions for potential approaches and tools proposed (see chapters 2.6, 3.6, 4.6 and 5.6). Noting multiple international initiatives that address this challenge, it is important not to reinvent wheels, while being able to identify and tailor the most suitable SDG impact management frameworks for various ecosystem stakeholders.

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<sup>7</sup> See e.g., SDG Impact Measurement Overviews - An Introduction 21 May 2021 | [rapport \(dnb.nl\)](https://rapport.dnb.nl)

## 2. Offshore wind power

### 2.1 Introduction to the ecosystem

Offshore wind power is expected to grow and develop rapidly during this decade. The biggest markets are in Europe<sup>8</sup>, but new growth markets are also emerging in the United States, Chinese Taipei and Japan. The global production is expected to grow from 35 GW (2020) to around 270 GW by the year 2030.<sup>9</sup> Several European countries have succeeded in accelerating offshore wind investments and production (e.g. Denmark, Germany, Great Britain, Norway and the Netherlands) and building world class competencies, technologies and renewable energy businesses also for international markets.

The Finnish coastline and the Baltic Sea as a whole form an attractive area for offshore wind. It has been estimated that around 10GW of new capacity could be built in Finland by the year 2030<sup>10</sup>. This would result in an increase of the renewable energy share and lower emission levels, and it would also build a ground for competence, technology and business development and assets for internationalisation and export for Finnish companies. Finland has set an ambitious [carbon neutrality target for 2035](#) with a critical role planned for wind power. Offshore wind is approaching market maturity and can, within the next few years also in the Finnish context, be expected to deliver taxonomy aligned energy and cost-efficient emission reductions without subsidies. However, the exact role of offshore wind within the Finnish carbon neutrality pathway and within Finland's green growth and competitiveness considerations remains open.

Investments in offshore wind are aligned with EU-level strategies. In November 2020, the European Commission presented the EU Offshore Renewable Energy Strategy, which sets a target for 300 GW of offshore wind by 2050. The EU strategy, part of the broader European Green Deal, provides a clear vision for offshore wind. Building a Finnish finance ecosystem around offshore wind power would therefore be well-aligned with this ambition.

### 2.2 Ecosystem vision

Demand for renewable electricity is expected to increase considerably in Finland. That partly originates from the need to replace fossil fuels in electricity generation and partly from growing consumption. Electricity demand in Finland is expected to double to 170 TWh in Finland by 2050<sup>11</sup>. The consumption can also be significantly higher than estimated in the base scenario depending on industrial growth in Finland as well as how new technologies like P2X solutions and electrification of technologies and processes will proceed.

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<sup>8</sup> With Denmark, Ireland, Germany, UK, Portugal and Spain hosting currently the biggest shares highest share of wind in their electricity mixes, and with the Netherlands leading the way for new installations. Wind energy in Europe 2020.Statistics and the outlook for 2021-2025. February 2021

<sup>9</sup> GWEC (2021). Global Offshore Wind report 2021

<sup>10</sup> Baltic Offshore Wind growth accelerator project, Business Finland, companies and Gaia

<sup>11</sup> Sitra (2021). Enabling cost-efficient electrification in Finland

Increased electricity consumption will add to the growing demand for renewable electricity in order for Finland to meet the national carbon neutrality target in 2035 and offshore wind power offers one opportunity to respond to that demand. Sufficient renewable electricity capacity can also attract new businesses to Finland and strengthen the Finnish economy. However, currently there is no clear national vision about how offshore wind could/should be part of the energy mix and of Finland's overall development ambitions. Hence a potential vision was developed by the pilot ecosystem core group (see Figure 6) and refined together with a broader group of stakeholders, including national workshops and further stakeholder consultations (see Annexes I-III).

Developing the offshore wind supply chain in Finland opens an opportunity for Finnish industrial companies to create technological solutions for offshore wind business which can be applied to extreme conditions with snow and frozen sea. These solutions can be expected to be applied not only in arctic conditions, but also in less extreme environment as a more durable solution and thus having also wider export potential and creating further jobs and welfare in the society. As part of the broader transformation towards a sustainable and green society, investments in offshore wind power provide synergies with other SDG objectives (Figure 8).

“Building a Finnish finance ecosystem around offshore wind power allows to accelerate the investments in offshore wind and enables sustainable electrification of the Finnish energy system.”



Figure 8. A vision for the ecosystem was developed with the aim to bring key stakeholders around the same table and build commitment for the required SDG transformation that could be advanced through investments in this ecosystem. An initial set of SDGs, which could be promoted through this ecosystem were identified.

As an integral part of refining and putting into action the vision, a more detailed approach and analysis for defining required measures, resources and investments, as well as approaches for tracking SDG impacts was developed (see sections 2.3 - 2.7).

## 2.3 Pilot ecosystem overview

### 2.3.1 Pilot ecosystem focus

The pilot ecosystem focus has been defined in collaboration with members of the ecosystem taskforce during 2021. Further input has been sought through complementary stakeholder interviews as well as a national workshop in September 2021, gathering input from a broad set of knowledge holders, also aiming to secure learning across all the four pilot ecosystems during the project (see Annexes I and II).

The offshore wind power pilot focuses on building new offshore wind farms (OWF) in Finland covering the entire value chain starting from planning process to energy system integration and operations & maintenance (O&M) after the construction. Even though the number as

well as capacity of onshore wind farms has grown rapidly in Finland and the speed of growth is increasing<sup>12</sup>, the offshore wind ecosystem is still in an early development phase. Despite major synergies, onshore wind solutions are not directly applicable to offshore contexts, hence it is critical to explicitly analyze, understand, and address bottlenecks within the offshore wind ecosystem in Finland. In setting the scene, the taskforce screened the full value chain, highlighting various areas in need of attention. Box 1 summarises main value chain elements with Figure 9 presenting the value chain.

*Box 1. The offshore wind power value chain – main components in need of attention*

**1. Surveys, assessments, measurements**

Offshore wind farms require a positive Environmental Impact Assessment and a favourable study showing the compatibility of the facility with the other uses of the maritime space, seabed studies & water depth to define the suitability of the site for types of foundation concepts as well as ice condition assessment. It should also be considered that solutions shall not cause disturbance to the radar use by the national defense. Several studies need to be conducted prior to the start of the project and to complement them during the construction and operations phases of the farm.

**2. Design & engineering**

E.g. technical designs of the offshore site, turbines layout, electrification plan, energy production calculations, budget and schedule of the construction project and supporting analysis

Building offshore wind in the Baltic Sea presents unique challenges due to winter conditions especially for the foundation design, blade performance and timing of the installation. Installation as well as demanding O&M tasks to be planned during outside winter months, when the sea is frozen.

**3. Supply of turbines, subsystems, materials**

Offshore wind turbine components are getting larger and to reduce logistical challenges components are transported by ships. Most of the turbine component materials can be recycled or reused, but blades are made of composite materials which is still a challenge.

**4. BOP supply**

Balance of plant (BOP) is the link for delivering power produced by the wind farm to the grid and consists of turbine foundation, cables offshore and onshore substations. Innovative foundation concepts designed for the Baltic Sea (gravity, monopile, jacket foundation) offer business opportunities to the Finnish industrial companies.

**5. Logistics, installation, construction management**

Harbours are important hubs for onshore functions and need investments to best support the construction as well as operation and maintenance of offshore wind parks. Harbours need to be able to provide quayside access to both for supply chain as well as operation and maintenance vessels and provide appropriate sites to support efficient and large-scale installation processes for manufacturing and construction companies. There are currently only a small amount of installation vessels available in Finland.

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<sup>12</sup> In 2020, 67 new wind power plants were built in Finland, with the total amount attaining 821 by the end of 2022 with a total capacity of 2,586 MW. In 2020, Finnish wind farms generated 7.8 TWh of electricity, which corresponded to less than 10 per cent of Finland's electricity consumption. Source [Motiva](#).



## 6. Finance, OWF owners, operators

Offshore wind farm investments are capital intensive and require a pool of investors and lenders to realise the project. Operators are responsible for developing, constructing and maintaining the offshore wind farm and can also have a role in coordinating the financing and be one of the owners of the wind farm.

## 7. O&M vessels and services


Harbours are central also for O&M (see 5.) Crew transfer vessels and service operations vessels for technician and equipment transfer and expected to provide e.g. diver support and cable maintenance. Access restrictions might occur during winter and could be mitigated by e.g., using helicopters for light maintenance. Drones are identified as a possible future tool for O&M.

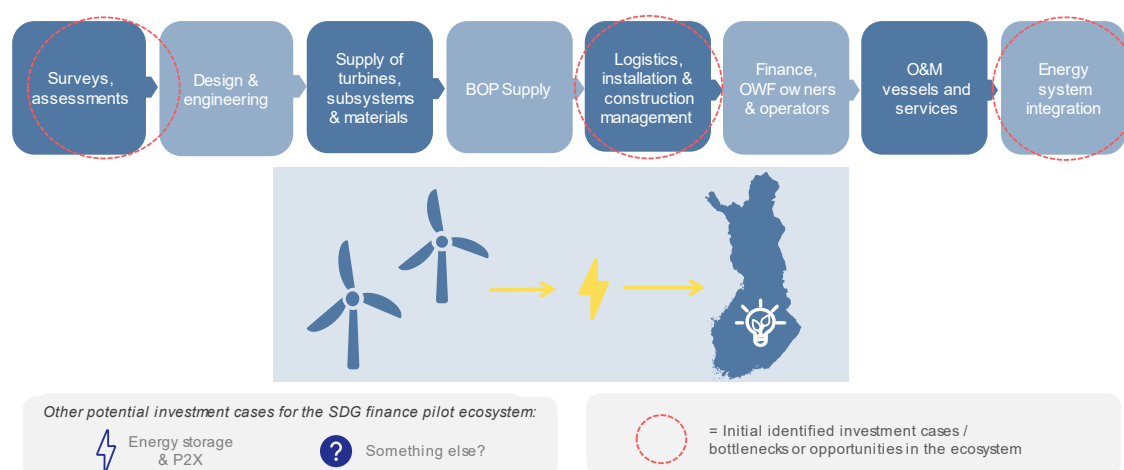
## 8. Energy system integration

Challenge for grid capacity to be able to transmit high volume of wind power from the main grid to the power consumers and significant grid investments are required. Onshore grid investments to strengthen the capacity of existing grid and expanding the grid offshore will also require investments in grid connection solutions and technologies to transmit the offshore generated power to the onshore grid. Power-to-X is a possible alternative for energy system integration.

2. OFFSHORE WIND POWER – SUSTAINABLE FINANCE ECOSYSTEM PILOT

## Offshore wind power – initial overview of the pilot

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Figure 9. Initial overview of the offshore wind power ecosystem with main elements of the value chain. The elements are summarised in box 1 above, with focus areas chosen for further attention during this pilot ecosystem marked in darker blue.

Based on further analysis with the pilot ecosystem task force, and additional stakeholder consultations, the following value chain elements were chosen as primary focus areas for this pilot, in need of development measures and future investments:

- As offshore wind power is taking its first steps in Finland, education and research play an important role in developing the ecosystem. Research is crucial for innovation and to develop new technologies in arctic maritime conditions in Finland, also more understanding how offshore wind farms impact the Finnish marine ecology is needed. It is also important to strengthen offshore wind relevant skills on several levels from technicians and project management to design and engineering, as well



as related to permitting processes and sustainable use (including rental) of marine areas.

- Onshore infrastructure, namely harbours and vessels, are required for both construction and maintenance of offshore wind farms. Harbours are important hubs for on-shore functions and need investments to best support the construction as well as operation and maintenance of offshore wind farms. Harbours need to be able to provide quayside access to both the supply chain as well as operation and maintenance vessels and provide appropriate sites to support efficient and large-scale installation processes for manufacturing and construction companies. There is currently only a small amount of installation vessels available in Finland.
- Significant grid investments are required to strengthen the capacity of existing on-shore grid and especially to expand the grid offshore. Investments are also required in grid connection solutions and technologies to transmit the offshore generated power to the onshore grid. Finally, these grid-level solutions must be optimized and synchronized with the national (also noting Nordic) level energy system plans.

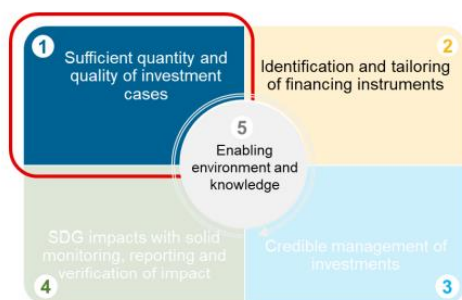
### 2.3.2 Ecosystem current state

Even though offshore wind farms are a well-established part of power generation portfolio in many European countries, in Finland offshore wind power ecosystem is still at an early development stage. Building an offshore wind farm is highly capital-intensive and requires significant up-front investments several years before the wind farm starts generating electricity and cash flow, and investors able to realise financial return. Hence, a solid financial framework including an optimal capital structure are crucial for an offshore wind farm investment.

The Finnish SDG Finance Roadmap outlines how Finnish stakeholders can contribute to achieving SDGs and especially how to mobilise funding to achieve the goals. It provides a framework for structuring analysis and identifying priority areas for required action. Regarding the 5 key components of Finland's sustainable finance roadmap, there are both visible ongoing good development and ongoing challenges. These are briefly presented below.

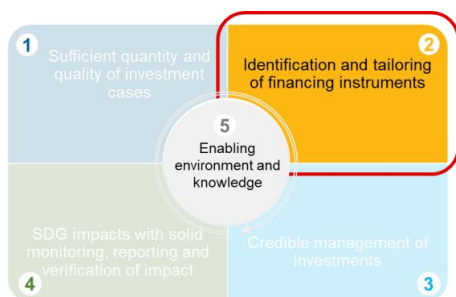
#### 1) Sufficient quantity and quality of investment cases

The offshore wind power ecosystem is at an early development stage in Finland. There is still only one offshore wind farm operating in Finland, despite a rapidly growing number of onshore wind farms, as noted below. The investment cases can be roughly classified in 2 categories: the offshore wind farm and the value chain. The three investment focus areas identified by the taskforce are in both categories and include numerous individual investments with significant investment needs. The size of required investments vary a lot from investments of some millions of euros to investments of billions of euros.



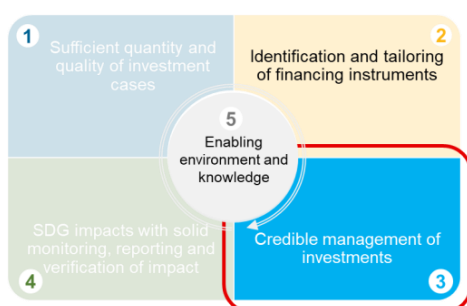
## 2) Identification and tailoring of financing instruments

The investment focus areas differ from each other and need to be considered when identifying and tailoring financing instruments. In general, offshore wind power is attractive to investors as a renewable energy source and as a proven concept elsewhere in Europe. However, different maritime conditions increase the risk profile as it implies higher technological risk. Both equity and debt financing are available for well-planned, feasible projects, but higher risk profile might impact the pricing and thus profitability. Due to the capital-intensive nature and early development phase of the investments public finance has also an important role.



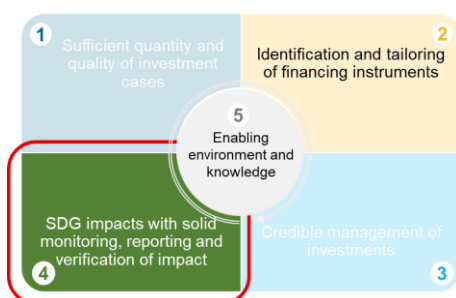
investors as a renewable energy source and as a proven concept elsewhere in Europe. However, different maritime conditions increase the risk profile as it implies higher technological risk. Both equity and debt financing are available for well-planned, feasible projects, but higher risk profile might impact the pricing and thus profitability. Due to the capital-intensive nature and early development phase of the investments public finance has also an important role.

## 3) Credible management of investments



The offshore wind farms are large projects and the project developer typically has a crucial role in attracting the capital and managing the investments for the wind farm. Regarding the other investment focus areas identification of suitable investment managers is important to build a credible offshore wind power ecosystem.

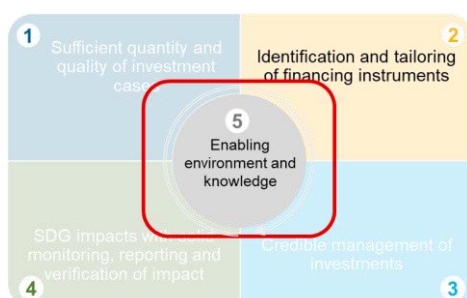
## 4) SDG impacts with solid monitoring, reporting and verification of impact



There is a need to identify impacts of the focus areas and creating a framework to measure, monitor and report the impacts. While international SDG monitoring frameworks and examples are available, experience in offshore wind power investments and hence SDG reporting remains limited in Finland. Also, socio-economic assessments of broader regional /national SDG impacts of major investments in offshore wind power remain scarce.

## 5) Enabling environment and knowledge

Offshore wind power is well supported by the EU Offshore Renewable Energy Strategy, which sets a target for 300 GW of offshore wind by 2050, as well as Finland's aim to be carbon neutral by 2035. Despite the clear longer term national vision, the role of offshore wind power as part of Finland's plan towards carbon neutrality is still unclear and creates uncertainty among investors. This is also reflected in the level of education, research as well as overall capacities, which are identified as one of the key investment focus areas for the offshore wind power ecosystem in Finland.



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A multi-disciplinary approach is needed to increase knowledge on offshore wind power in arctic conditions and develop skilled people in various areas of the ecosystem.

### **Existing investment cases in the ecosystem**

There is currently only one existing investment case, Tahkoluoto offshore wind farm built by Suomen Hyötytuuli Oy in Pori in 2017. The wind farm has 11 offshore windmills with the height of 80-90 meters and generates ca. 155 GWh electricity annually.

### **Ecosystem bottlenecks**

Following the scoping of the wind power ecosystem and an initial analysis of the current state of finance flows and mobilization capacity, the task force focused on more detailed analyses of the bottlenecks for mobilizing investments. The main bottlenecks are described below and presented in an order that broadly reflect stakeholder views noted during pilot ecosystem work as well as stakeholder consultations and national workshop input (see Annexes I-III).

#### *Vision (bottleneck 1)*

Finland has an ambitious target being carbon neutral by 2035. However, there is currently no clear national vision about how strongly offshore wind will be part of the energy mix of Finland going forward. A vision would anchor offshore wind's role in the Finnish energy system for years to come and remove uncertainties and risk profile from investor point of view.

#### *Permitting process (bottleneck 2)*

Permitting processes for offshore wind farms differs somewhat from onshore wind projects, among other due to unclear land /ocean ownership frameworks and lacking environmental /ocean impact data. A main bottleneck is the lead time that the handling of the permit takes. The permitting process is not straightforward and there can be several complaint processes ongoing simultaneously, which makes the whole process cumbersome, uncertain and time consuming. In cases of complaints, the permitting process can take several, possibly over 5, years. Permitting process would also benefit of offshore wind power related relevant understanding and skills.

#### *Grid connection (bottleneck 3)*

Connecting offshore wind power to national electricity grid is significantly more costly than electricity generated by other fuels as there is currently no grid in the maritime area.

#### *Ensuring EU Taxonomy alignment (bottleneck 4)*

While offshore wind farms in Finland is a priori EU Taxonomy aligned, it is important to proactively address potential concerns linked to Do No Significant Harm (DNSH) criteria. This links particularly to securing resources and capacities for high quality environmental assessments, and where needed sustainable mitigation offsetting processes (see also bottlenecks 6-8).

#### *Value chain (bottleneck 5)*

As there is currently only one offshore wind farm in Finland, the value chain is underdeveloped, meaning that there is only a limited number of, if any, subcontractors and/or

maintenance providers. This reduces the security of supply. Investments in onshore infrastructure and vessels and relevant skills are required to strengthen the value chain.

*Duration of reservation agreements for maritime areas (bottleneck 6)*

The duration of the reservation agreements is limited and too short for an investment like offshore wind farm. The lifecycle of an offshore wind farm can exceed the duration of reservation agreement for the area.

*Available maritime areas (bottleneck 7)*

Despite vast marine areas and long coastline in Finland, maritime areas available for offshore wind power farms are limited. It would be optimal to locate offshore wind farms in proximity to electricity consumption to facilitate electricity distribution and reduce costs by shorter connections. Electricity demand in Southern Finland is high, however, the optimal maritime areas in the Gulf of Finland are not available for offshore wind farms. This reduces the attractiveness of offshore wind investments.

*Sustainability considerations, ecological concerns and permitting processes (bottleneck 8)*

Ecological factors, like bird nesting, migration routes of birds or distribution of vulnerable species, might become an obstacle in the offshore wind farm permitting process. Also, strengthening the research on how offshore wind farms impact the Finnish marine ecology would increase understanding of the ecological impacts and how to mitigate potential risks (see also bottleneck 4).

*Funding for pilot sites (bottleneck 9)*

Offshore wind pilot sites in arctic conditions are crucial for commercialisation of not only the offshore wind farms, but also the whole ecosystem including construction and operation & maintenance. However, it is challenging to obtain financing for pilot sites. Additionally, research is crucial for innovation and development of new technologies in arctic maritime conditions.

*Resources for PPP projects (bottleneck 10)*

Offshore wind farms are very capital intensive and public-private-partnerships would be an ideal model to finance and lead the projects. Kicking off PPP projects require a lot of resources, which is a bottleneck, especially in the early phase of the project.

*Profitability, revenue uncertainty (bottleneck 11)*

Return for offshore wind farm investment depends on the price of the generated electricity. As the hedging opportunities are limited, the revenue uncertainty might become a bottleneck from lender's perspective. There is a clear demand for long term PPA's with transparent carbon pricing.

## 2.4 Analysis of current financial instruments

Achieving an offshore wind power target in the range of 5-10GW of offshore wind power in Finland by 2030 will require significant investments not only in the wind farms, but also in the entire value chain. The investments can also be classified accordingly. While a formal

national vision is still in the making in Finland, this potential range indicated as ambitious but feasible by several stakeholders, has served as initial vision for pilot ecosystem work.

The offshore wind farms require significant amounts of capital and due to its long lifecycle from development phase through construction to operation & maintenance phase, offer different risk levels in different stages of the lifecycle. Offshore wind as a renewable energy source increases the attractiveness of the investments. The risk level of the investments is higher in Finland as the offshore wind market is still immature and the arctic environment increases construction/project risk requiring new technologies to be implemented.

The investments in the offshore wind power value chain differ a lot from each other by the nature of the investments (from education to vessels), the size and the risk profile. Gearing up the supply chain capabilities in Finland will also allow the Finnish industry to compete for offshore wind projects globally and to create new export industry opportunities.

The offshore wind market in Finland is in an early development phase and therefore mobilising the needed capital will require coordinated action by all market participants including the public sector as well as financial and corporate sectors. Also, development of blended finance alternatives is of high importance in attracting the capital towards offshore wind power investments, both towards wind farms and its value chain. An overview of national financial actors and key instruments are presented in Figure 10 and Table 1.

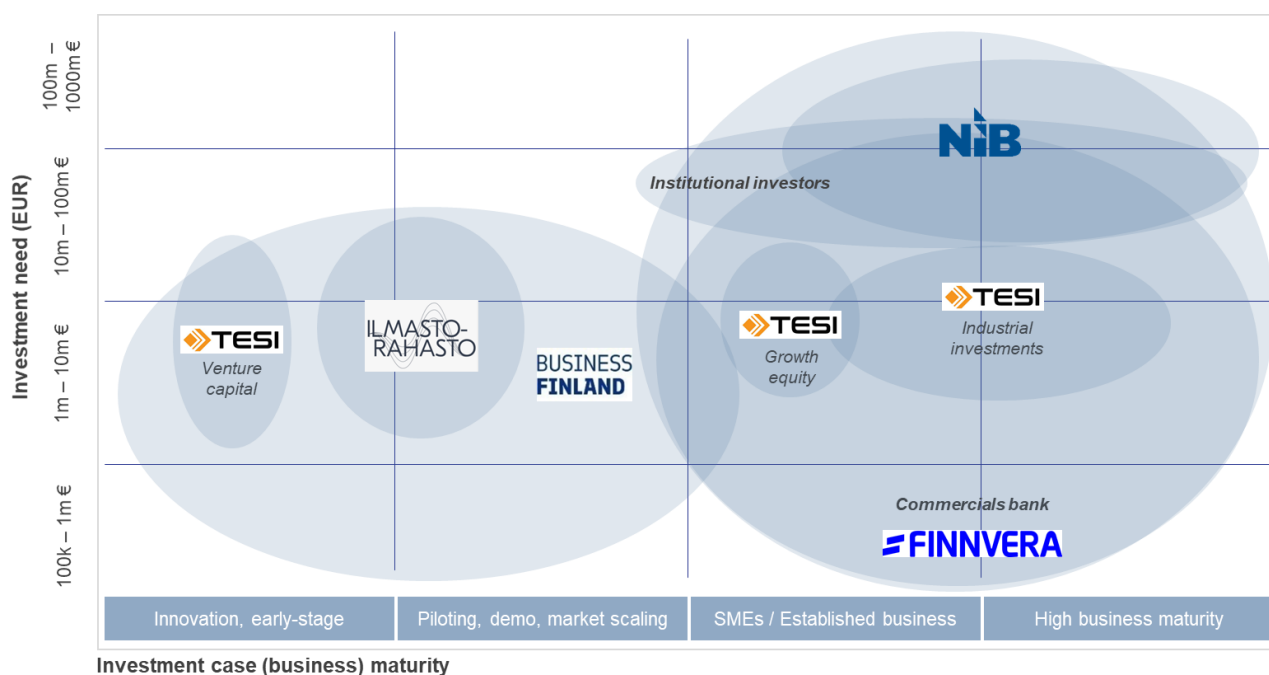


Figure 10. National financial actors related to the offshore wind power ecosystem

The financing needs and risk levels of investments in the offshore wind power ecosystem vary a lot and therefore also different sources of financing are needed as well as different financial instruments. Overall, subsidies and grants provided by public sector can strengthen the capital base of offshore wind projects. Equity financing is available from venture capital and infrastructure funds to large institutional investors like pension funds and government private equity/venture capital institutions like TESI and Ilmastorahasto (see Table 1) can have an important role in allocating capital towards offshore wind projects. Debt financing is

available by both government credit institutions and commercial banks, also institutional investors are potential investors for bond takeouts.

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Current public financial organizations and instruments relevant to this ecosystem are presented in Table 1.

*Table 1. Current public financial organizations and instruments relevant to the offshore wind ecosystem*

Organization	Funding type	Brief description of instruments
TESI	Equity	Investments typically EUR 2-20 million <ul style="list-style-type: none"> <li>• Venture capital (later stage venture capital market; participating as part of a syndicate in A-C investment rounds)</li> <li>• Growth equity (minority investments in SMEs on a strong growth path)</li> <li>• Industrial investments (major industrial companies and their investments in Finland, investments include new plants, new equipment and expansion projects)</li> </ul>
The Climate Fund	Hybrid	Investments typically EU 1-20 million. <ul style="list-style-type: none"> <li>• Currently provides hybrid capital, typically subordinate debt, or uses special investment funds</li> <li>• Participates in investments projects led by either private or public actors or public-private-partnerships (PPP)</li> </ul>
Business Finland	Debt	<ul style="list-style-type: none"> <li>• For SMEs' development and piloting projects, Business Finland grants a loan covering 50% or 70% of the project's total costs.</li> <li>• For large and mid-cap companies, the loan covers a maximum of 50% or 70% of the costs, respectively.</li> </ul>
Finnvera	Debt & guarantees	Loans and guarantees as part of the agreed total financing together with other financiers.
Nordic Investment Bank	Debt & guarantees	Corporate loans, loans to municipalities, project and structured finance: e.g private public partnership (PPP) financing.



		As an InvestEU implementing partner, NIB can provide guarantees to local actors under the 4 policy windows (see e.g. <i>Sustainable infrastructure and Social investment and skills</i> )
Nefco	Equity & debt	<ul style="list-style-type: none"> <li>• Focus on the scale-up of Nordic environmental and climate-friendly solutions in international markets.</li> <li>• Up to EUR 5 million financing for economically viable green projects with positive environmental impact.</li> </ul>

### EU finance opportunities and international lessons learned

Next to the financial instruments provided by national funding organisations listed above on the local Finnish market, there are various finance opportunities and best-practice instruments at the European level as well that could benefit and support the development of the offshore wind power ecosystem in Finland.

The following notable flagship European initiatives, funds and instruments are available for early development phase investment support, relevant within the context of this particular ecosystem and with the potential to mobilise private sector investments:

- **The Innovation Fund (IF)** is the NER300 successor for period 2021-2030, focusing on highly innovative technologies and big flagship projects within Europe that can bring on significant emission reductions. The IF is financed by revenues from the auctioning of allowances under the EU ETS and may amount to about €10 billion, depending on the carbon price.<sup>13</sup> The IF can support the demonstration of innovative clean technologies at commercial scale, such as ocean energy, new floating offshore wind technologies or projects to couple offshore wind parks with battery storage or hydrogen production. Even though there is no official maximum limit for the funding each project can receive, examples from the previous NER300 results show that the largest funding provided was in the range of €200 million for advanced biofuels projects, while for offshore wind power the range was between €30 and 35 million for 25 MW projects.<sup>14</sup> Support from this fund can be combined with InvestEU or CEF funding to increase the viability of such innovative projects and to finance adjacent infrastructure.
- **The Connecting Europe Facility (CEF)** is a funding programme that supports trans-European networks and infrastructures in the sectors of transport, telecommunications and energy. The projects need to be first identified as Projects of Common Interest (PCI). In the case of offshore wind projects, CEF funds can be used to map potential offshore development sites, fund the necessary studies and exceptionally to fund construction

<sup>13</sup> [https://ec.europa.eu/clima/policies/innovation-fund\\_en](https://ec.europa.eu/clima/policies/innovation-fund_en)

<sup>14</sup> [https://ec.europa.eu/commission/presscorner/detail/de/MEMO\\_12\\_999](https://ec.europa.eu/commission/presscorner/detail/de/MEMO_12_999)



works, for projects between multiple Member States. In the future, CEF intends to focus more on cross-border offshore grid infrastructure development, including hybrid and meshed projects. CEF Funds can be blended with InvestEU loans or IF grants.

- **The InvestEU Programme (InvestEU)** builds on the successful model of the Investment Plan for Europe, or the “Juncker Plan”, and aims to simplify and streamline several of the current EU investment support schemes. The InvestEU Fund, as part of the InvestEU Programme, aims to trigger more than €372 billion of additional public and private investment through an EU budget guarantee of €26.2 billion that backs the investment of implementing partners. Project promoters should apply directly to implementing partners, such as the EIB, EIF, NIB and other financial institutions, who will offer tailor-made financing solutions based on the financial products supported by the EU guarantee. Financial intermediaries should also consult the offering of implementing partners active in their regions proposing relevant products.<sup>15</sup>

Box 2 presents an international case study on how financing bottlenecks have been addressed in the Netherlands, highlighting solutions that are being discussed also within the Finnish offshore wind power ecosystem. The Dutch case study highlights the importance of terminologies and understanding differences in political contexts, as the offshore wind parks in the Dutch North Sea area are being referred to as “*energy investments without government subsidies*”, while important costs of developing the enabling environment have actually been carried by the public sector.

Additionally, European Investment Bank (EIB) and European Investment Fund (EIF) have been identified as central sources for financing in developing the offshore wind power ecosystem in Finland.

#### *Box 2. Framework for offshore wind farm permit auctioning Dutch North Sea area*

In the Netherlands, a **strong regulatory framework** and **enabling environment** has been put in place for offshore wind power:

- A **Ministerial Order for Offshore Wind Energy** passed Parliament in 2015, which sets the regulatory framework and targets for developing and exploiting offshore wind energy **up to 11 GW** in the North Sea designated areas.
- A **National Climate Agreement (“Nationaal Klimaatakkoord”)** has been negotiated and agreed among public sector authorities, sector and industry representatives, civil society organisations and NGOs in 2019. The NCA puts GHG emission reduction targets into **binding sector-level obligations and legislation**. Among the targets is a **70% RES electricity target** by 2030 (around 84 TWh), which mainly needs to be delivered through **offshore wind farms in the North Sea area (49 TWh)**.

As part of the **Stimulation of sustainable energy and climate transition** (“Stimulerend Duurzame Energie en Klimaattransitie” – SDE++) **subsidy scheme**, the Netherlands Enterprise Agency (RVO) executes **(competitive) offshore wind permit tenders**.

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<sup>15</sup> [https://europa.eu/investeu/home\\_en](https://europa.eu/investeu/home_en)

- Next to setting the regulatory framework, the Dutch government **bears all costs for putting in place the necessary enabling environment**, such as (technical) feasibility studies, due diligence research, legal procedure to assign designated areas for offshore wind farms;
- By law, the Dutch TSO (TenneT) is **obliged to connect offshore wind farm** to the electricity grid on the mainland and provide the **interconnector infrastructure** for the offshore wind farm. TenneT raises capital for this on the capital market;

The above has resulted into three wind farms being permitted **without any government subsidy**.

### Analysis of the current instruments and available finance

The investment needs and risk levels within the ecosystem vary and investors and lenders with different levels of risk appetite are required to ensure the availability of funding. The ecosystem is also in an early development phase and public financial instruments in the form of subsidies, loans and guarantees are needed to ensure transition towards a more mature industry.

Offshore wind farm investment amounts up to billions of euros and requires several parties to finance the project. To find the optimal balance for equity and debt financing and to combine the risk appetite of investors and lenders participating in the project in different phases of the project's lifecycle require strong financial and risk management skills. Optimal finance structure has an impact on finance costs and is therefore crucial to ensure the competitiveness once the wind farm is operational.

The identified investment areas in the value chain to speed up offshore wind power investments each have different financing needs and risk levels and therefore different sources of financing and different finance structures are required.

- Education and research typically depend on public financing, which forms major part of financing of universities and other educational institutions. Their financing can be complemented by grants from private sector e.g. foundations or industrial corporations wanting to strengthen the availability of skilled employees in their own area of business. Also, Social Impact Bonds (SIB) can be considered as a blended finance alternative combining public and private funding for education and research.
- Harbours and vessels require up-front investments several years before the wind farm is operational and delivering revenue streams. This increases the risks and consequently impacts the finance structure putting more weight on equity financing. However, once the wind farm is operational it can be expected to deliver stable long term returns and hence having a good debt service capability, why debt financing is also a viable financing alternative.
- Grid infrastructure is crucial for balanced power supply and investments both in grid capacity and grid connections are needed. Grids in Finland are a natural monopoly and therefore their debt service capability is considered good making debt financing an attractive option. However, in many countries it has been decided to speed up the investments in renewable energy and the grid connection is fully financed by the government and thus improving the competitiveness of offshore wind power.

Billion-euro scale investments are needed to build a solid offshore wind power ecosystem in Finland. As a new industry in Finland, it has a high risk profile and combined with high ticket sizes it will lead to complex finance structure. Attracting investors to invest in offshore wind power in Finland will therefore require a strong national vision on offshore wind power's role in Finnish energy portfolio going forward.

## 2.5 Ecosystem investment portfolio

### Potential investment cases in the ecosystem

Three main investment priority areas were identified by the taskforce as focus areas for future investments to speed up the offshore wind power investments in Finland. These included upfront investments in both research & education, grid connections and onshore infrastructure are essential to be able to kick off an offshore wind farm investment. Therefore, visibility for upcoming offshore wind farm investments is necessary for suppliers to be prepared for new business opportunities. Figure 11 illustrates the identified investment needs and possible funding sources, with more detailed descriptions under the figure.

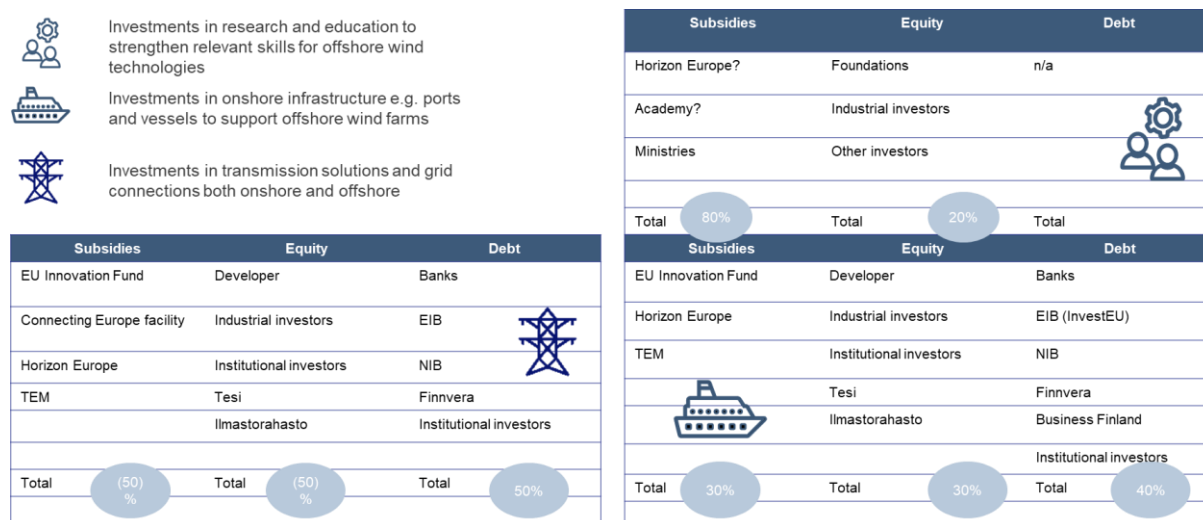


Figure 11. Focus areas of investment needs/cases in the offshore ecosystem and potential funding sources.

- Research & education

Educating people from scratch is a slow process and can take several years, so fast-track programmes are needed to strengthen the skills and ensure skilled workforce for offshore wind power ecosystem. Research provides a faster route to improve skills, however, it also takes time. Hence it is important to promote agile collaboration between corporates and universities to share knowledge and build value-based networks. Blended finance alternative to accelerate the education and skills development could be e.g. Social Impact Bond (SIB). Mutual interest can also attract financing for RDI project from private sector as public financing for research decreases.

- Logistics, installation & construction management

Offshore wind requires a robust infrastructure and collaboration across the value chain to deliver an efficient and secure energy system. Ports are owned by municipalities who in general are interested to increase activity in ports and thus make the necessary investments to support offshore wind farms. Investing in infrastructure capability supports the growth of offshore wind in Finland as well as export opportunities of Finnish companies. Public financing is available for onshore investments through subsidies and grants as well as through government private equity/venture capital institutions such as Tesi and Ilmastorahasto. Also, public credit institutions EIB, NIB, Finnvera and Business Finland are an important source of funding as debt financing is a viable alternative for these investments. For onshore infrastructure investments a wide range of public financing instruments are already available.

- Grid connection

Grid infrastructure is crucial for balanced power supply. The onshore grid capacity needs to be strengthened and expanding the grid offshore requires investments in grid connection solutions and technologies to transmit the offshore generated power to the onshore grid. Some countries have opted for paying the offshore grid connection, thus supporting the offshore wind industry development in the country. This alternative has demonstrated lower electricity prices<sup>16</sup>.

### **Investment need in the ecosystem**

Achieving the offshore wind power vision 10GW of offshore wind power in Finland by 2030 will require billion-euro scale investments not only in the wind farms, but also in the entire value chain.

- The offshore wind farms require significant amounts of capital and due to its long lifecycle from development phase through construction to operation & maintenance phase, offer different risk levels in different stages of the lifecycle. Offshore wind as a renewable energy source increases the attractiveness of the investments. The risk level of the investments is higher in Finland as the offshore wind market is not yet mature and the arctic environment increases construction/project risk requiring new technologies to be implemented.
- The investments in the offshore wind power value/supply chain differ a lot from each other by the nature of the investments (from education to vessels), the size and the risk profile. Gearing up the supply chain capabilities in Finland will also allow the Finnish industry to compete for offshore wind projects globally and to create new export industry opportunities.

A very rough estimate for a 5 GW offshore wind power investment is € 8 billion. Based on the input of the pilot ecosystem stakeholders the most capital-intensive, billion-euro-level investments should be made in offshore windmills, onshore infrastructure, construction and logistics as well as in integrating the offshore wind farms to energy system. Planning phase

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<sup>16</sup> Jansen 2020 – Offshore wind competitiveness

initiatives, including investments in surveys, assessments, design and engineering as well as investments in vessels and services for maintenance require each also significant investments in the range of tens or up to hundreds of millions of euros.

### **Ecosystem potential to attract sustainable finance**

Renewable energy is an attractive investment target for investors allocating funds towards sustainable investments. Sustainability criteria, especially climate and environmental criteria, have become important decision-making criteria for investors beside financial criteria. The EU Taxonomy provides a science-based framework for investors to make informed investment decisions in sustainable investments. Offshore wind power is eligible for making a substantial contribution to climate change mitigation in EU Taxonomy context. This enhances the offshore wind power ecosystem's potential to attract sustainable finance. However, assessing EU Taxonomy alignment requires that also Do No Significant Harm (DNSH) criteria and minimum social safeguards criteria are met.

Ecosystem credibility in the future is essential to ensure the attractiveness of offshore wind power ecosystem for financiers. Credibility is based on national vision for offshore wind power's role in Finnish energy system, sufficient amount of investment cases to enable scalability for the parties in the value chain and profitability of the investments. Public finance instruments have an important role enabling longer term competitiveness and the journey towards profitable business. Public sector has obviously a central role in ensuring access to relevant education and skilled labour, but many of the current SDG transitions require rapid changes and increases in knowledge bases and vocational skills. Box 3 presents one potential opportunity for boosting education and skills development in line with the offshore wind power and mobilizing private finance through results based finance models.

#### *Box 3. Results based finance for a boosting education and skills development*

##### **Results-based finance for boosting education and skills development**

Lack of skilled workforce creates a bottleneck for achieving offshore wind power vision. While the Finnish education system is strong, its ability to respond fast changing needs is limited. Social impact bond (SIB)\* in education could provide a fast track to produce experts in the field of wind power, required on land and offshore. In Finland, several [SIBs](#) are already up and running and the approach is familiar to Finnish stakeholders. An education outcome oriented -SIB could offer tailored solution for the urgent need for skilled labor. The wind power education -SIB would be based on:

Estimated labor demand, by occupation, based on

- forecast for offshore wind power, MW, years 2022-2030
- forecast to full time employed (FTE) based on the offshore wind power forecast, average FTE / MW, years 2022-2030
- forecast for FTE without SIB = current + new graduates – retiring workers
- estimated need for labor = forecast to FTE - forecast to FTE without SIB

The SIB could be designed in such a way that it can match labor and estimated labor demand in time and quality. It could also consider other relevant issues such as job losses in the fossil energy sector to create even more value for the society, by helping in a just transition.

\*In Finnish context, the SIB must be put out to tender and contract periods are typically 4-10 years. SIB is responsible for collecting needed finance, to bring service providers and use these to produce the agreed outcomes. Payments are based on pre-determined, verified outcomes and investors bear the financial risk.

## 2.6 SDG impact and disclosure

While section 2.2 outlines the overall vision, the **primary** SDG impacts of offshore wind power include SDG 7 – Affordable clean energy and SDG 13 – Climate Action. However, several other SDGs can be considered relevant (**as secondary impacts**) as offshore wind power will also:

- Generate health benefits by reducing short-lived climate pollutants from energy generation (SDG 3)
- Promote sustainable economic growth as well as full and productive employment (SDG 8).
- Open new business opportunities by building resilient infrastructure, sustainable industrialization and foster innovation (SDG 9).
- Support making cities inclusive, safe, resilient, and sustainable (SDG 11).
- Protect and restore sustainable use of ecosystems and halt biodiversity loss (SDG 15)<sup>17</sup>.

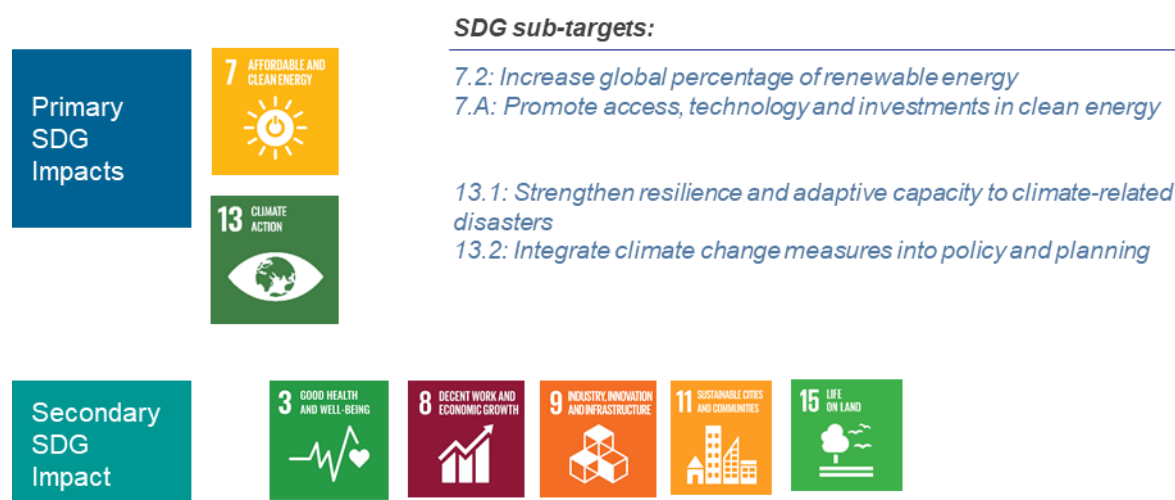


Figure 12. The primary development impacts delivered through investments in offshore wind production are linked to SDG 7 and SDG 13, with the sub targets providing a useful framework for refining target setting and reporting. However, in many cases multiple secondary impacts can be achieved but need to be defined and monitored in a tailored manner.

For measuring the impact of offshore wind power towards the related SDGs, suitable key performance indicators (KPIs) need to be found and tracked. The reduction of greenhouse gases (GHG) from the energy sector is one of the most relevant KPIs (SDG 13). It is science-based and describes explicitly the impact. Different approaches are taken to measure the impact of other relevant SDGs, where contributions to society welfare or social causes can

<sup>17</sup>Measuring progress towards the Sustainable Development Goals, <https://sdg-tracker.org/>

take many different forms, e.g. improved employment, research & innovation, share of renewable energy in the local/global energy mix, improved air quality in cities.

When considering the suitable methodology and indicators to measure offshore wind power-related SDG impact, it is important to take into account the whole value chain. This allows identifying relevant KPIs that enable understand and disclose how the investment contributes to relevant SDGs and track the performance. Table 2 lists some potential KPIs to track progress towards the related SDGs.

*Table 2. Selection of potential relevant KPIs for the offshore wind ecosystem actors<sup>18</sup>*

7.2.1 Renewable energy share in the total final energy consumption
7.A International financing in support of clean energy research and development and renewable energy production
7.1 Number of people with access to affordable, reliable and modern energy services
% of global CO2 emissions avoided
Reduction in GHG emissions from the energy sector
Reduction in short-lived climate pollutants (black carbon, HFCs, methane, tropospheric ozone) from energy sector (disaggregated by economic sector, geographic location)
Number of jobs created
3.9 Mortality rate from air pollution
8.4.1 Material footprint, material footprint per capita, and material footprint per GDP
9.4.1 CO2 emissions per unit of value added (carbon intensity)
11.6.2. Urban air pollution (annual mean levels of fine particulate matter in cities)
15.9.1. Integration of ecosystem and biodiversity in planning

Some investors in offshore wind production have already done elaborate SDG impact tracking in their value chain. Figure 13 below describes the approach of Danish offshore wind company Ørsted<sup>19</sup>

<sup>18</sup> <https://sdg-tracker.org/> ; PRI Impact Investing Market Map: <https://www.unpri.org/download?ac=5426> ; Enabling SDGs through inclusive, just energy transitions [https://www.un.org/sites/un2.un.org/files/2021-twg\\_3-exesummarie-062321.pdf](https://www.un.org/sites/un2.un.org/files/2021-twg_3-exesummarie-062321.pdf)

<sup>19</sup> Read more on Ørsted's approach in their Sustainability Report (2020): <https://orstedcdn.azureedge.net/-/media/annual2020/sustainability-report-2020>



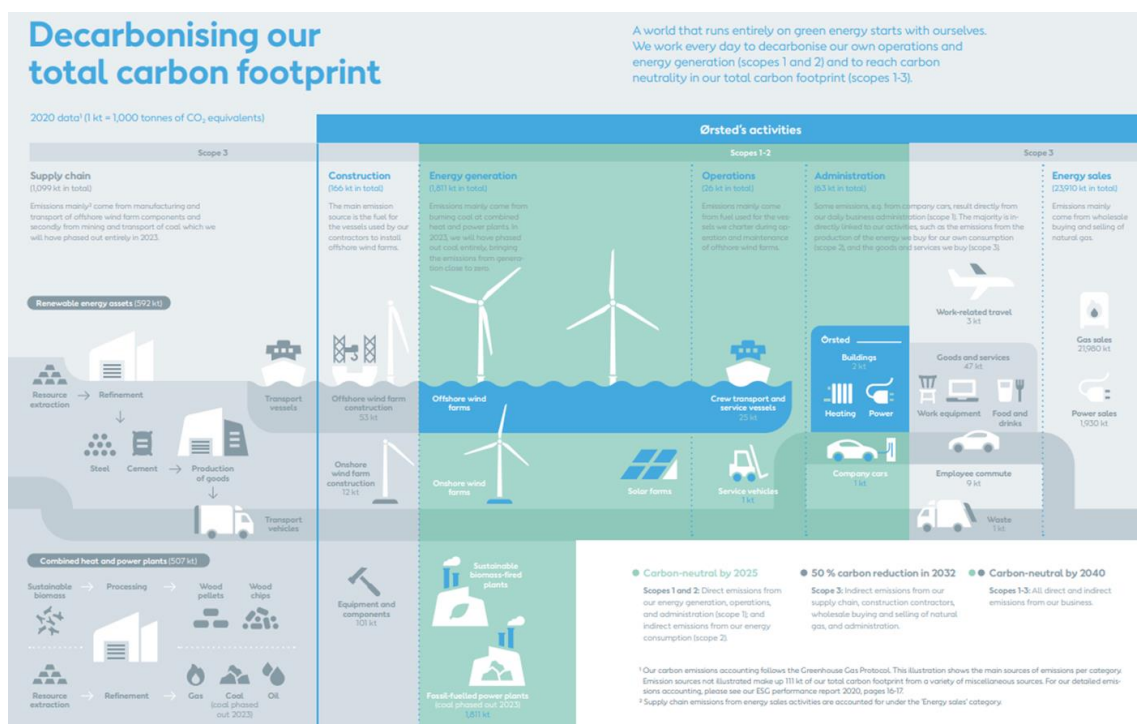


Figure 13. Ørsted's value chain approach on decarbonisation of their total carbon footprint

## 2.7 Key findings and recommendations to public sector

The recommendations to the public sector to advance the offshore wind power investments in Finland, jointly developed in the pilot ecosystem meetings and wider workshops are presented below. The recommendations are prioritized, so that the most important recommendations from the viewpoint of stakeholders are mentioned first under each theme<sup>20</sup>. Every recommendation is linked to the relevant bottlenecks, identified above.

### Recommendation 1: Streamlining of permitting process

Offshore wind power farm requires several permits and streamlining the processes across authorities, e.g. coordination of appeal processes, can facilitate the permitting process with improved visibility and reduced uncertainties. It should also be ensured that offshore wind related skills are available in the permitting process to ensure a smooth process. Streamlining of the permitting process has a positive impact to pricing of financing hence reducing the finance costs of offshore wind power.

Addressing bottlenecks<sup>21</sup>: 2. Permitting process, 6. Area reservations

Timing: During 2022

<sup>20</sup> The prioritization is done according to the votes received in the ecosystem workshop on 24.9.2021.

<sup>21</sup> See description of bottlenecks above in chapter 2.3.

### **Recommendation 2: Developing a national offshore wind power vision 2030**

Clear national vision which integrates development of offshore wind power ecosystem to execution of Finland's carbon neutrality target in 2035 will reduce uncertainties and improve risk profile of offshore wind investments towards investors. Political guidance shows the direction and encourages collaboration in administration to streamline legislation and allocate resources.

Addressing bottlenecks: 1. National vision, 2. Permitting process, 6. Area reservations, 10. PPP projects

Timing: During 2022

### **Recommendation 3: Financial support to pilot and demonstration projects**

Pilot projects enable testing of new technologies and demonstration projects encourage the formation of a domestic supply chain and enable the commercialization of new technologies. Successful projects reduce technology risk and encourage new projects, as well as improve access to finance.

Addressing bottlenecks: 9. Funding of pilot projects

Timing: As soon as possible

### **Recommendation 4: Creating an auction-based subsidy model for offshore wind power**

New forms of production typically need support in the early stages. An auction-based support model<sup>22</sup> for offshore wind power can be created, for example, on the basis of either a feed-in tariff or a price premium. A grid connection can also be connected to this.

**Addressing bottlenecks: 3. Grid connection, 9. Funding of pilot projects, 11. Revenue uncertainty**

Timing: During next government period

### **Recommendation 5: Boosting a joint forum for the offshore wind value chain**

Improving visibility for future investments by enabling knowledge sharing across different actors within the ecosystem. Improved collaboration is also a precondition for formation of new collaborative models. Building on existing forums, such as the Finnish Wind Power Association, and boosting joint collaboration, can help increase visibility in offshore wind power, accelerate pipeline development, help address systematically the identified bottlenecks, and eventually help Finland reach its carbon neutral targets as well as attract carbon-free industry to Finland.

Addressing bottlenecks: 5. Value chain

Timing: During 2022

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<sup>22</sup> For definitions and examples see. IRENA and CEM (2015), Renewable Energy Auctions – A Guide to Design.

### **Recommendation 6: Accelerating educational cooperation and innovative finance for knowledge building**

An agile collaborative model to increase competence in both basic research and vocational education. This can be done, for example, by setting up offshore wind training programs with educational institutions and offshore wind operators. Combining public and private funding for research and education can also be implemented e.g. through Social Impact Bonds (SIB).

Addressing bottlenecks: 2. Permitting process, 5. Value chain, 8. Sustainability considerations

Timing: As soon as possible / during next government period

### **Recommendation 7: Establishing a subsidy model for the grid connection**

In some countries, the state bears the cost of connecting offshore wind power to the grid. Costs can vary significantly whether they are made as DC or AC connections, and this is naturally also affected by the distance of the offshore wind farm from the grid.

Addressing bottlenecks: 3. Grid connection, 9. Funding of pilot projects, 11. Revenue uncertainty

Timing: During next government period

### **Recommendation 8: Refine an approach and business model for sustainable use of state marine areas**

Maritime spatial planning is based on the EU Maritime Spatial Planning Directive (2014/89 / EU), which requires an ecosystem approach to planning. The objectives for the use of marine areas are clear and widely accepted, with the aim of promoting the sustainable use of maritime industries, the sustainable use of marine resources and the achievement of good environmental status in the marine environment. How areas are actually used for offshore wind power in Finland continues to take shape, especially from the perspective of how the public sector could simultaneously promote its national climate and environmental targets and optimize the return on the sustainable use of offshore areas.

Addressing bottlenecks: 4. EU Taxonomy, 6. Area reservations, 8. Sustainability considerations

Timing: During next government period

### **Recommendation 9: Establish a compensation model for the marine ecosystems**

Investments in national research into the environmental impact of the construction and operation of offshore wind power and ensuring cooperation in leading international networks and initiatives investigating the environmental impact of offshore wind power would give Finland a good basis to i) design effective ecological compensation policies for Finnish sea areas, ii) test models in practice and iii) support streamlining of permitting processes.

The development of expertise in sustainable compensation approaches and models can contribute to build required capacities for ensuring that offshore wind investments are in line with EU taxonomy (including DNSH criteria), and facilitate future international, including EU,

funding for investments in Finnish maritime areas. The models could also contribute to credible monitoring of potential positive side effects from well-designed offshore wind solutions.

Addressing bottlenecks: 3. Grid connection, 4. EU Taxonomy, 8. Sustainability considerations, 9. Funding of pilot projects, 11. Revenue uncertainty

Timing: During next government period

**Recommendation 10: “Financial agents” actively screening and offering suitable public funding to companies**

Public funding today is scattered across different sources, under different application criteria, and is perceived as difficult to understand for potential applicants. “Financial agents” in the public sector could solve this problem by presenting suitable sources of financing directly to companies and creating a user friendly one-stop-shop for public funding sources.

It is also recommended to screen any project relating to offshore wind ecosystem whether they are eligible for EU Recovery and Resilience Facility (RRF). An offshore wind farm itself is not eligible as the investments in line with RRF criteria shall be implemented by 2026, but it could be applied for e.g. pilot projects or projects within the value chain supporting offshore wind ecosystem.

Addressing bottlenecks: 9. Funding of pilot projects, 10. PPP projects

Timing: As soon as possible

## 3. Sustainable protein production

### 3.1 Introduction to the ecosystem

Industrial animal agriculture and protein production requires significant amounts of energy, water and land use, while emitting GHG emissions representing approximately 10% of global emissions. A major part of world's agricultural land is devoted to raising and feeding livestock, thus eroding soil, contributing to deforestation and using valuable land resources. According to some estimates the hidden (environmental, health and poverty related) costs of the food system amount to some 12 trillion USD annually, while the market *value* of the global food system is *estimated* to be 10 trillion USD.<sup>23</sup> Globally, a growing demand for food presents a challenge that is increasingly sparking new innovations and efforts to build more sustainable and healthy food systems.

One of the core challenges is to meet the global protein demand with reduced environmental impacts, while ensuring a fair and just transition in the agricultural sector as one of the cornerstones of the society. The future of sustainable protein production requires investments in developing and commercializing plant-based protein sources, transformative changes in agricultural practices (including regenerative farming), new innovations in sustainable and circular fish farming, as well as, supporting and identifying other compelling protein production sources including crickets and insects as well as seaweed, to name a few.

Sustainable protein production is directly related to EU policies on sustainable food systems. The EU's Farm to Fork strategy<sup>24</sup> is a key part of the European Green Deal, and it aims to ensure that the whole food chain, covering food production, transport, distribution, marketing and consumption, has a neutral or positive environmental impact<sup>25</sup>.

Overall, sustainable protein production has notable potential to address land degradation, water scarcity and climate change mitigation and adaptation, hence offering multiple direct and indirect pathways to advance several SDGs. Investments in the sustainable protein ecosystem can help transform the Finnish food system but offer simultaneously high potential for international scaling and helping different geographies to move towards more sustainable and healthy food systems.

### 3.2 Ecosystem vision and SDG impacts

Finland is famous for providing high-quality and safe food and nutrition. This is for example due to clean environment, good soil and water availability, as well as the geographically wide area available for farming. However, sustainable protein production is a rather new area for the Finnish stakeholders – even though in recent years there has been increasing

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<sup>23</sup> The Food and Land Use Coalition (FOLU) Report 'Growing Better: Ten Critical Transitions to Transform Food and Land Use, 2019. See e.g. <https://www.wbcsd.org/contentwbc/download/8553/131256/1>

<sup>24</sup> [https://ec.europa.eu/food/horizontal-topics/farm-fork-strategy\\_en](https://ec.europa.eu/food/horizontal-topics/farm-fork-strategy_en)

<sup>25</sup> [https://knowledge4policy.ec.europa.eu/global-food-nutrition-security/topic/sustainable-food-systems/navigation-page/eu-action-sustainable-food-systems/eu-policies-sustainable-food-systems\\_en](https://knowledge4policy.ec.europa.eu/global-food-nutrition-security/topic/sustainable-food-systems/navigation-page/eu-action-sustainable-food-systems/eu-policies-sustainable-food-systems_en)

attention towards building an ecosystem and a number of new initiatives in this area (e.g. Protein cluster<sup>26</sup> coordinated by VTT and Climate-friendly Food Programme being prepared by the Ministry of Agriculture and Forestry<sup>27</sup>, see more information in section 3.3.2.).

To bring stakeholders together a shared ecosystem vision was formed. The ecosystem vision (Figure 14) was built together with the sustainable protein pilot ecosystem core group, and further refined through broader stakeholder involvement. Key elements of the vision include a) covering the whole value chain from primary production to demand side, b) improving self-sufficiency and resiliency of crop production and other raw material production, c) expanding the capacity and being a forerunner in innovation, d) focusing on Finnish added value and bringing solutions also to international market (e.g. clean and organic raw materials).

“Through investments in this ecosystem, Finland builds capabilities and innovation around sustainable protein production across the value chain.

In the primary production Finland improves self-sufficiency and resiliency of supply of sustainable protein sources. Finland has more capacity and innovative companies to commercialize sustainable protein products both nationally and internationally. The value chain delivers targeted SDG benefits while doing no significant harm.”



Figure 14. A vision for the sustainable protein ecosystem was developed with the aim to bring key stakeholders around the same table and build commitment for the required SDG transformation in the food sector.

The ecosystem has the potential to advance several of the SDGs. Sustainability impacts link most directly to SDG 15 (promoting sustainable use of terrestrial ecosystems, halting biodiversity loss etc) but also contribute to SDGs 3 (good health and well-being). Indirect contributions to SDG 13 (climate change), SDG 7 (clean energy, through bioenergy applications) and SDG 14 (life below water through reduced nutrient flows to waters) may also be identified. In international development of the ecosystem there is also potential to advance SDG 2 (zero hunger) and SDG 17 (partnerships for the goals).

As an integral part of refining and putting into action the vision, a more detailed approach and analysis for defining, measuring and reporting the SDG impacts that are created through investments in the ecosystem is developed (see section 3.6).

<sup>26</sup> [https://www.vttresearch.com/sites/default/files/pdf/publications/2021/Protein\\_cluster\\_Report.pdf](https://www.vttresearch.com/sites/default/files/pdf/publications/2021/Protein_cluster_Report.pdf)

<sup>27</sup> <https://mmm.fi/en/climatefriendlyfoodprogramme>

## 3.3 Pilot ecosystem overview

### 3.3.1 Pilot ecosystem focus

**The sustainable protein pilot ecosystem focuses on plant-based and microbe/fungi-based protein production along the whole value chain (from primary production to customer demand).** Plant-based protein production is an area where Finland has already made progress and has existing success stories (e.g. see below ecosystem current maturity). In addition, plant-based and microbe/fungi-based protein production has significant potential impact if the identified bottlenecks can be addressed. The most pressing bottlenecks in the sustainable protein ecosystem in Finland are:

- A key challenge in the value chain of plant-based protein production is that there is **no production plant for protein isolate** yet in Finland. Protein isolate is a key intermediate product used in plant-based protein food products, and so far the Finnish producers of such products have had to import the isolate from other countries, in particular from central Europe such as France.
- In the primary production, the **share of protein crops is low**<sup>28</sup>. A key challenge in improving the availability of Finnish sustainable protein products, is to improve the availability of local raw material.
- Additionally, Finland does not have sufficient production facilities for potential **“future protein sources”**, e.g. algae, microbes, mushrooms.

Due to these bottlenecks, this pilot ecosystems focuses on improving the sustainable finance ecosystem around plant-based protein. The main focus areas include targeting sustainable finance into:

- a) Primary production (agriculture, protein crop production)
- b) Protein isolate production plant
- c) “Future” protein production plant (microbe/fungi-based protein, etc)
- d) Production of other products from side streams

Investments in these areas are needed to improve the overall performance of the sustainable protein value chain in Finland.

Secondary focus areas, areas that are important that not in primary focus of this pilot ecosystem, include the development of raw materials to non-agricultural protein sources, e.g. algae, mushrooms, microbes, etc. The task force identified these areas highly important to create future sustainable protein products. However, ecosystem’s maturity related to these

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<sup>28</sup> Finland produces several protein-rich plants, such as legumes and pulses (green peas, field beans), field mustard and rapeseed. Grains (wheat, oats, rye, spelt) also contain protein, but only approx. 25% of the protein content in legumes and pulses. The combined share of green peas and field beans of total crop production was only 1.3% in 2019 in Finland. Source: Lampinen, M., Voutilainen, E., Mattila, O., & Nordlund, E. (2021). Proteiiniklusterilla vauhtia kansalliseen yhteistyöhön: Ekosysteemimalli käytännön toteutuksena. VTT Technical Research Centre of Finland.



protein sources is still relatively low and mainly in research and development phase. It is important to follow the progress also in this area as in the future more and more potential investment cases will focus on alternative protein sources.

In addition to bottlenecks presented above, a key identified challenge is sufficient demand for new protein products (e.g. overall awareness and interest towards sustainable protein by companies, individuals). Demand side is difficult to promote through financial instruments. Due to high importance to boost the ecosystem, it is still important to address any drivers that could help to improve the demand for sustainable protein (e.g. public procurement).

Figure 15 presents a summary of the definition of focus areas in this ecosystem. While the focus is strongly in Finland, the applicability of the lessons learned, and in particular the business solutions promoted and scaled through this pilot have considerable international up-scaling potential, when tailored to local (international) context.

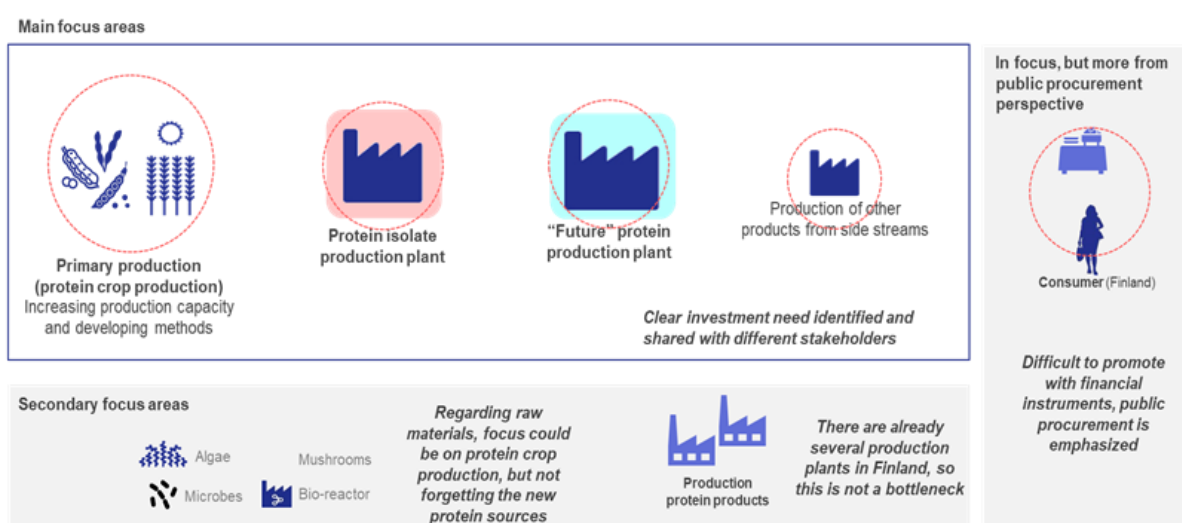


Figure 15. Summary of the definition of focus areas in this ecosystem

### 3.3.2 Ecosystem current state

**The sustainable protein ecosystem is still at an early development stage in Finland.** Overall the current investment portfolio within the pilot ecosystem is quite small. However, investors are showing a growing interest towards investing in the field of sustainable protein and more broadly, sustainable agriculture and food. Even during 2021 there has been significant development in this field. Initial investment interest is available, for example a new venture capital fund called Nordic FoodTech VC was launched in 2019, being the first thematic VC fund in the Nordics fully focused on investing in food-tech startups. In October 2021 Nordic FoodTech VC announced the closing of its first fund at 42 million euros, exceeding the 40 million euros target size. The anchor investor for the fund is government-owned Business Finland VC, for which the 20 million euros investment is the largest commitment to a single VC fund so far<sup>29</sup>.

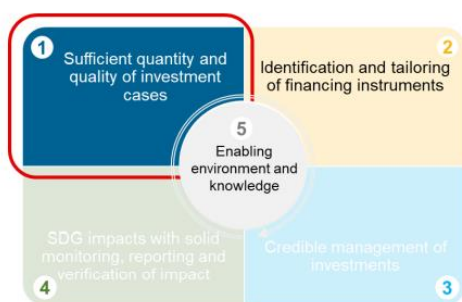
<sup>29</sup> <https://www.nft.vc/blog/nordic-foodtech-vc-closes-a-42m-fund>

In Finland, the position and market share of plant-based protein is growing at an accelerating pace, but the market for plant-based protein products is still developing and export is on relatively low level. The total volume of plant-based protein products produced in Finland in 2017 was 0.85 million kilos and it is estimated to rise to 1.43 million kilos in 2021. The value of the market for plant-based protein products in 2021 is estimated at 31 million euros.<sup>30</sup>

In autumn 2020, the Ministry of Agriculture and Forestry, the Cereals Cooperation Group VYR and VTT Technical Research Centre of Finland launched a project aimed at activating the national network of sustainable protein -related organisations and creating a cooperation model, a **national protein cluster**, that would enable more efficient primary production, production, distribution and use of plant-based protein products.<sup>31</sup> The protein cluster has identified the creation of new networks, partnerships and ideas, increasing the profitability of the value chain, and increasing the awareness and attractiveness of plant protein products as its key possibilities to influence the protein markets in Finland. The Ministry of Agriculture and Forestry of Finland is currently preparing the national **Climate-friendly Food Programme** aimed to support the transition of society towards a climate-sustainable food system. The project was launched in the beginning of 2020. The Climate-friendly Food Programme will define the objectives that have the best and greatest impact on creating a climate-sustainable food system in Finland. After the preparatory phase, key projects will be prioritized, a network of project actors will be established, and funding, objectives and the target timetable will be decided.<sup>32</sup> Both the protein cluster and the Climate-friendly Food Programme will help in advancing the vision of the sustainable protein ecosystem.

Regarding the 5 key components of Finland's sustainable finance roadmap, there are both visible ongoing good development and ongoing challenges. These are briefly presented below.

### 1) Sufficient quantity and quality of investment cases



The ecosystem is at an early development stage in Finland – there are few existing success stories in Finland. These are driven by traditional large companies and small innovative start-ups, but the existing SMEs are not currently very visible in the ecosystem. Investments are needed in parallel and holistically in the whole value chain to boost the ecosystem to the next level – in addition, key bottle-

necks are related to large industrial scale factory investments. There is a limited number of concrete investment cases with credible actors and existing cash flows. In primary production, there are clear investment needs, but agricultural transition will require systemic change.

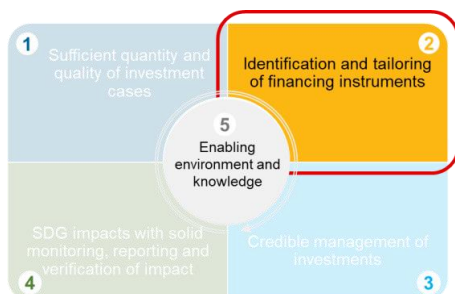
<sup>30</sup> Lampinen, M., Voutilainen, E., Mattila, O., & Nordlund, E. (2021). Proteiiniklusterilla vauhtia kansalliseen yhteistyöhön: Ekosysteemimalli käytännön toteutuksena. VTT Technical Research Centre of Finland.

<sup>31</sup> Lampinen, M., Voutilainen, E., Mattila, O., & Nordlund, E. (2021). Proteiiniklusterilla vauhtia kansalliseen yhteistyöhön: Ekosysteemimalli käytännön toteutuksena. VTT Technical Research Centre of Finland.

<sup>32</sup> <https://mmm.fi/en/climatefriendlyfoodprogramme>

## 2) Identification and tailoring of financing instruments

Primary production is challenging from the finance perspective – there are large total investment needs, but scattered to multiple small actors. Successful start-ups can attract VC capital, which is increasingly available. A Public-Private Partnership instrument could support the ecosystem.

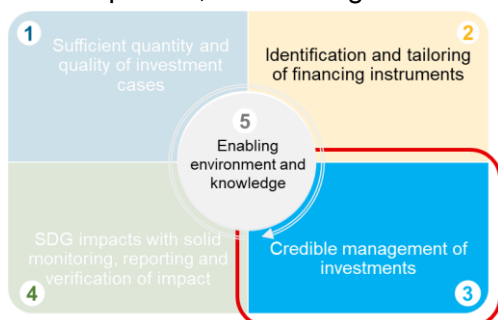


Actors face challenges in utilizing public finance (the instruments and related information is scattered, information not easily available, actors have difficulties in fulfilling financing conditions). EU funding requires specific skills that ecosystem players do not usually have. Small companies or farmers often lack knowledge on the specific EU funding sources available for them, and resources and skills for doing the

funding applications. Due to low maturity and/or high risk, debt financing (e.g. banks) is not easily available or applicable. Public finance available for this sector is not applicable for higher risk profile (not willing to take additional risk compared to market).

## 3) Credible management of investments

There is credible financial management expertise in Finland, but it is fragmented. It is not a question of managing an individual investment but of running an ecosystem. There is sufficient expertise, but it is fragmented into a number of different bodies that are not, as a whole,

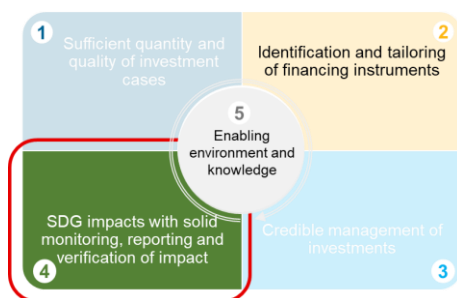


expert organizations in this field. There are now the first thematic VC funds focusing on this sector, which have good thematic expertise. Public sector finance organizations do not specifically target sustainable protein investments. Finnish Climate Fund could provide additional capital in the ecosystem, with credible management of investments. Some private investors, such as FIM (now part of S-Pankki<sup>33</sup>) have also been active in food sector.

But more credible managers of thematic investments would be needed in Finland to scale up the ecosystem from current level. A suitable body would be needed as a coordinator.

<sup>33</sup> <https://www.s-pankki.fi/fi/private-banking-ja-varainhoito/>

#### 4) SDG impacts with solid monitoring, reporting and verification of impact



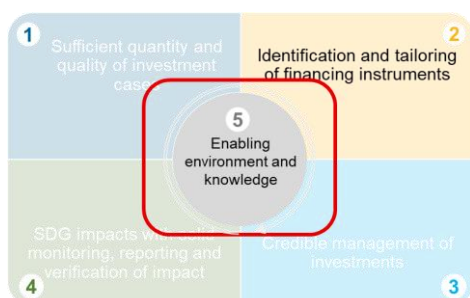
There is a need to identify impacts of the focus areas and creating a framework to measure, monitor and report the impacts. The framework should cover separately a) primary production and b) industrial investments, which have different types of SDG impacts.

#### 5) Enabling environment and knowledge

##### *Enabling environment:*

The EU Common Agriculture Policy (CAP) is the main legislative environment in the field of primary production. There are not much room for national changes in the agricultural policy and its subsidy system. The CAP does not specifically target plant-based protein production, and pilot ecosystem participants pointed out that it could partly even hinder the development of the sustainable protein ecosystem through wide subsidies towards traditional animal-based protein production<sup>34</sup>.

Public procurement emphasizing SDG impacts would boost the ecosystem. Public sector



organizations (e.g. schools) are important buyers of protein products, and sustainable procurement of food products could have a significant impact on the demand side.

Cooperation of different ecosystem actors is key – it would be good to have an “integrator” role in the ecosystem. Cooperation is also key for developing future scenarios for the sector.

##### *Skills & capacities:*

There is a clear need for R&D and education in the food sector on sustainable protein production. There is also a need for knowledge support in agriculture and primary production (e.g. generational changes). Capacities are needed to transform raw material production towards sustainable plant- or microbe/fungi-based protein sources, to handle the risks related to changing raw materials. Capacity building is needed, e.g. in the form of training and education.

<sup>34</sup> While CAP is an integral element of enabling environment of sustainable protein production, the pilot ecosystem stakeholders suggested to focus on aspects that could be influenced and changed by Finnish stakeholders within the project period. CAP details are agreed on EU level. CAP does have some elements that directly or indirectly recognise plant protein benefits from an environmental point of view or maintain and support the production of protein crops in the EU, such as rural development programmes or voluntary coupled support (VCS).

## Existing investment cases in the ecosystem

During the last years, Finnish organisations and researchers have developed a range of protein products from plant-based sources, as a credible and sustainable alternative to meat products. These include e.g. the following, which are already available in supermarkets and also sold internationally:

- **Pulled oats** by Gold&Green Foods (owned by Paulig), produced from oats, fava beans and pea protein,
- **Härkis- and Beanit-** branded products by Verso Food (part of Norwegian Kavli Group), produced from Nordic fava beans
- **Jalotofu and Jalotempe** products produced in Finland by Jalofoods, produced from European soybeans and Finnish green peas and fava beans.<sup>35</sup>
- **Vöner** by Vöner Oyj has recently moved the production of all its plant-based protein products (kebab style products from wheat protein) from Germany to Finland. Now the Finnish invention is also produced locally.<sup>36</sup>
- **Nordic Soya** produces different types of soya-based products (e.g. soybean meal, Soy Protein Concentrate (SPC), soybean oil, soy molasses) in Finland. Its products are used in food industry as well as animal and fish feed industry.<sup>37</sup>

In addition to the plant-based protein products, Finnish innovations in this field include e.g. single-cell protein product **Solein**, by food-tech start-up Solar Foods, which is based on microbes, carbon dioxide and electricity. Solar Foods is currently operating a small pilot plant in Espoo, which has a design capacity of 1 kg/day<sup>38</sup>. The company has said that by 2023, it would bring to market a total of 20 different consumer products in a global commercial launch. By April 2020, the company had raised a total of EUR 4.3 million in funding, and in April 2021, the Finnish Climate Fund (Ilmastorahasto) gave Solar Foods a EUR 10 million capital loan<sup>39</sup>. In October 2021 Solar Foods announced that they will start constructing their demonstration-scale factory in 2021 and are targeting the investment decision to a full-scale factory by 2024.<sup>40</sup>

Another interesting upcoming technology is the **Nauvu** algae and seaweed processing methodology by Origin by Ocean start-up.<sup>41</sup> The company has secured the seed phase funding of EUR 2 million funding for the development of algae processing technology. Finland's first algae processing plant is planned to be operational with full production capacity in 2027.<sup>42</sup>

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<sup>35</sup> <https://www.goodnewsfinland.com/feature/finland-feasts-on-sustainable-foods-for-the-future/>

<sup>36</sup> <https://voner.fi/yritys/>

<sup>37</sup> <https://www.nordicsoya.com/company/company-information>

<sup>38</sup> [https://solarfoods.fi/wp-content/uploads/2019/11/Solein-Q\\_and-A\\_FULL.pdf](https://solarfoods.fi/wp-content/uploads/2019/11/Solein-Q_and-A_FULL.pdf)

<sup>39</sup> <https://www.ilmastorahasto.fi/en/finnish-climate-funds-first-investment-target-solar-foods-strives-to-achieve-significant-emissions-reductions-in-food-production/>

<sup>40</sup> <https://solarfoods.fi/factory/#roadmap>

<sup>41</sup> <https://originbyocean.com/faq/>

<sup>42</sup> <https://www.submariner-network.eu/alliance-plus-cases/87-alliance-cases/771-origin-by-ocean-processor-of-harvested-and-farmed-sea-biomass>

In the production of other products from protein crop sidestreams, there is a new development in November 2021, when **Nordic Soya** announced that a pilot plant will be built in City of Uusikaupunki to produce bioplastics (polylactic acid, PLA) from the sidestreams of soy production. The plant is the first of its kind in the world. The non-edible sidestreams of soy production have previously been disposed of by incineration in heat production<sup>43</sup>.

### **Ecosystem bottlenecks**

*The first two bottlenecks are related to primary production of protein crops, with bottlenecks 3-5 mainly related to R&D and early-stage business development.*

- Bottleneck 1: Primary production (incl. processing) and promotion of domestic raw material production is a key bottleneck to be solved - today a significant part of raw material has to be imported from abroad.
- Bottleneck 2: Current agricultural policies and support models may not sufficiently support the transition to sustainable protein production, as they are formed in a large extent to support animal-based protein production.
- Bottleneck 3: Low commercialization of research: resources, strategic orientation and how to increase commercial innovations are important issues to tackle in ecosystem development
- Bottleneck 4: Lack of domestic protein isolate production in Finland due to the scale of the investment and human resources needed, and a large side stream quantity that needs to be efficiently handled<sup>44</sup>- because of the lack of Finnish isolate production, the production of fully domestic isolate-based sustainable protein products is so far impossible
- Bottleneck 5: The challenge of raising early-stage business finance is significant: how can high-risk start-ups take innovation from the laboratory to the pilot phase?

#### *Other ecosystem bottlenecks*

- Bottleneck 6: Challenges in promoting industrial-scale investment (later stage & growth) with suitable financial instruments
- Bottleneck 7: The (lack of) organization of the public funding field and the challenges in the awareness / usability of funding and the “ease” of applying for funding
- Bottleneck 8: Challenges in influencing the demand side - how to ensure that there is enough demand for new products?

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<sup>43</sup> <https://www.kemia-lehti.fi/soijan-tahteet-muuntuvat-biomuoviksi/>

<sup>44</sup> So far protein isolate is only produced in large countries such as France, because of the significant financial and human resources needed for the production. The needed industrial investment is very large, raw material research for using local crops is needed, there are massive side streams from production (approximately 75%), which need to be utilized in an efficient manner, food technological skills and trials are needed, top of the line commercial skills needed to commercialise the main isolate product.

- Bottleneck 9: Low maturity: The early stage and fragmentation of the ecosystem - how is sustainable protein production made known in the world and in Finland?
- Bottleneck 10: Needs in developing business skills of farmers, research-based startups and other small businesses working in the sustainable protein ecosystem.

The bottlenecks are further analyzed in the financial instruments analysis section below.

## 3.4 Analysis of current financial instruments

Overview of national financial stakeholders is presented in Figure 16.

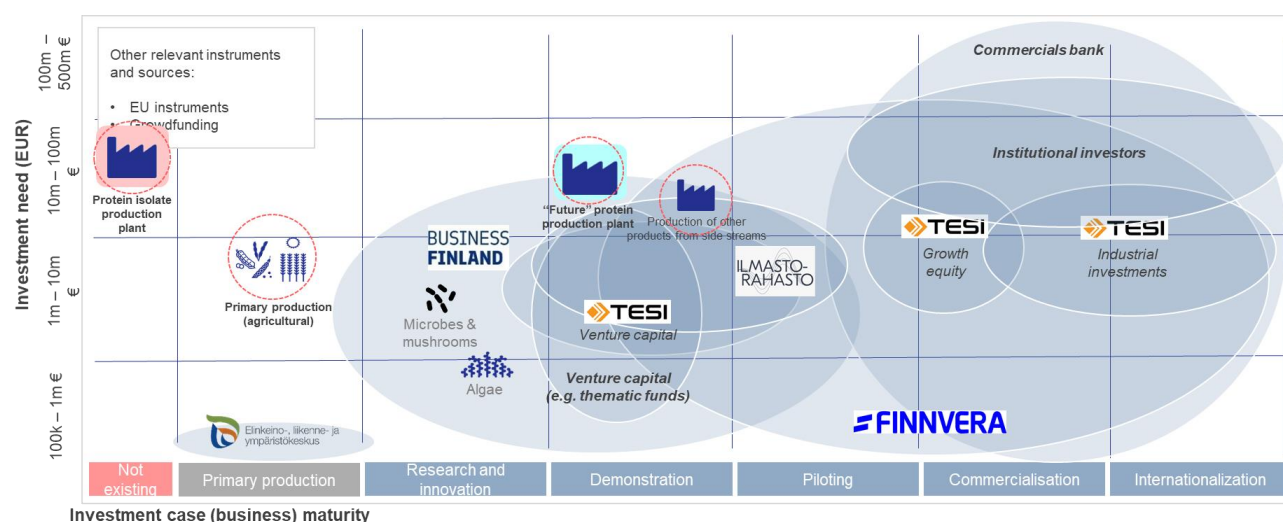


Figure 16. National financial actors related to the sustainable protein ecosystem

Current public financial organizations and instruments relevant to this ecosystem are presented in Table 3.

Table 3. Current public financial organizations and instruments relevant to the protein ecosystem

Organization	Type	Description of the instruments / target size
TESI	Equity	<ul style="list-style-type: none"> <li>• <b>Venture capital</b> (later stage venture capital market; participating as part of a syndicate in A-C investment rounds) <ul style="list-style-type: none"> <li>○ Investment size EUR 2-5 million, size of investment round EUR 3-25+ million)</li> </ul> </li> <li>• <b>Growth equity</b> (minority investments in SMEs on a strong growth path) <ul style="list-style-type: none"> <li>○ Investment size EUR 5-20 million</li> </ul> </li> <li>• <b>Industrial investments</b> (major industrial companies and their investments in Finland, investments include new plants, new equipment and expansion projects)</li> </ul>



		<ul style="list-style-type: none"> <li>Investment size EUR 5-20 million.</li> </ul>
Business Finland	Debt          Grants	For SMEs' development and piloting projects, Business Finland grants a loan covering 50% or 70% of the project's total costs. For large and mid-cap companies, the loan covers a maximum of 50% or 70% of the costs, respectively.  Business Finland also gives government assistance (grants) to e.g. research institutions and companies to commercialize their research (e.g. Research to Business finance)
Climate Fund	Equity, debt	Debt, equity, mezzanine funding (minority role); both private and public companies; also PPPs <ul style="list-style-type: none"> <li>Industrial scale-ups: EUR 2-20 million</li> <li>Enabling platforms: EUR 1-10 million</li> </ul>
Finnvera	Debt, guarantees	Loans and guarantees as part of the agreed total financing together with other financiers.
ELY-Keskus/ Centre for Economic Development, Transport and the Environment	Grants	ELY Centres support the establishment, growth and development of small and medium-sized enterprises by providing advisory, training and expert services and by granting funding for investment and development projects. ELY Centres are responsible for developing rural industries and ensuring the vitality of the Finnish countryside (e.g. maaseudun yrittäjärahoitus).
Institutional investors	Equity	Equity investments by e.g. pension funds, insurance companies, mutual funds, hedge funds and private equity funds

## EU and other international finance opportunities

Next to the financial instruments provided by national funding organisations listed above on the local Finnish market, there are various finance opportunities and best-practice instruments at the European level as well that could benefit and support the development of sustainable protein production in Finland. The following notable flagship European initiatives, funds and accelerator programmes are available for early development phase investment support, relevant within the context of this particular ecosystem and with the potential to mobilise private sector investments:

- **Horizon Europe** is the main European programme funding research and innovation, with a total available budget of €95.5 billion for the 2021-2027 period, from which €8.9 billion are assigned for projects under Cluster 6: "Food, bioeconomy, natural resources, agriculture and environment". Horizon Europe aims to tackle low-carbon and environmental

degradation challenges, achieve the SDGs and boost the EU's competitiveness and growth.<sup>45</sup> Some examples of projects that received funding from Horizon 2020 show sustainable food security projects receiving grants of around €8 million

- **European Innovation Council Accelerator (EIC Accelerator)** supports individual SMEs, in particular Start-ups and spinout companies, to develop and scaleup game-changing innovations. The EIC Accelerator provides substantial financial support with a) grant funding (non-dilutive) of up to €2.5 million for innovation development costs, and b) investments (direct equity investments) of up to €15 million managed by the EIC Fund for scale up and other relevant costs. The EIC Accelerator looks to support companies where the EIC support will act as a catalyst to crowd-in other investors necessary for the scale-up of the innovation, in particular for those with major impacts on EU Green Deal innovations for the economic recovery process.
- **EIT Food Accelerator Networks (EIT FAN) Programme** connects impactful agri-food start-ups with industry-leading corporate and research partners to pilot their technology and drive the ultimate goal: a successful market adoption. The EIT FAN judges look for high-impact agri-food startups, with a viable path to success and some traction/progress in their plans. Successful EIT Food start-ups have successfully raised external investments as a result of the programme before.
- **European Agricultural Fund for Rural Development (EAFRD)** finances the EU's contribution to rural development programmes (RDPs). RDPs consist of measures and projects that contribute to the EU-wide objectives of improving the competitiveness of agriculture, encouraging sustainable management of natural resources and climate action and achieving a balanced territorial development of rural economies and communities. Programme duration is 2021-2027, and total budget during this period is € 95.51 billion. Climate contribution of the finance is expected to be 40% in 2023-2027.<sup>46</sup>
- **The InvestEU Programme (InvestEU)** builds on the successful model of the Investment Plan for Europe, or the “Juncker Plan”, and aims to simplify and streamline several of the current EU investment support schemes. The InvestEU Fund, as part of the InvestEU Programme, aims to trigger more than €372 billion of additional public and private investment through an EU budget guarantee of €26.2 billion that backs the investment of implementing partners. Project promoters should apply directly to implementing partners, such as the EIB, EIF, NIB<sup>47</sup> and other financial institutions, who will offer tailor-made financing solutions based on the financial products supported by the EU guarantee. Financial intermediaries should also consult the offering of implementing partners active in their regions proposing relevant products.<sup>48</sup> Small mid-caps, SMEs and social or micro-enterprises should apply to their local commercial or public banks whose financial products

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<sup>45</sup> [https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe\\_en](https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en)

<sup>46</sup> [https://ec.europa.eu/info/funding-tenders/find-funding/eu-funding-programmes/european-agricultural-fund-rural-development-eafrd\\_en](https://ec.europa.eu/info/funding-tenders/find-funding/eu-funding-programmes/european-agricultural-fund-rural-development-eafrd_en)

<sup>47</sup> As an InvestEU implementing partner, NIB can provide guarantees to local actors under its 4 policy windows.

<sup>48</sup> [https://europa.eu/investeu/home\\_en](https://europa.eu/investeu/home_en)

are covered by the EU guarantee in their country or region. The local intermediary will inform them if a particular financing programme is covered by the InvestEU Fund.

Box 4 presents an analysis of the current state-of-play around financing sustainable protein production, and the role of the financial sector, in the Netherlands based on a diagnostic case study report published in May 2021. The report presents interesting key findings and recommendations in relation to the financing needs of start-ups within the sustainable protein supply chain, the role of the public sector as enabler of the protein transition, and the how to on-board larger institutional investors in this process.

*Box 4. Case study: the crucial role of Dutch banks in the sustainable protein transition*

In May 2021 a diagnostic case study on the role of the Dutch financial sector in the protein transition was published by Fair Bank Guide Netherlands (*Financing less meat and more plants – A case study on the crucial role Dutch banks can play in the protein transition*<sup>49</sup>). The report investigated the role that banks can play in the transition towards a food system less dependent on animal protein and more based on plant-based and alternative sources of protein. Key findings and recommendations from the report, relevant within the context of the sustainable protein production ecosystem in Finland, include the following:

- The transition towards a more plant-based is not only indispensable, but also achievable, which **offers huge opportunities**: the plant-based and alternative protein production sector could become an **important growth engine** for the Dutch economy. However, considerable barriers to the protein transition remain. **Bottlenecks persist at almost all steps in the supply chain**, including difficulties for primary producers to transition to arable or mixed farming; **access to capital for start-up and scale-up food companies producing plant-based protein products**; vested interests among some large meat, dairy and food companies that limit their willingness or ability to participate in the transition; and supermarket business models heavily dependent on marketing meat at very low costs.
- To accelerate the protein transition, banks could be **agents of change** helping to address these bottlenecks. At present, however, several banks still have a **large exposure to traditional animal proteins** and are hardly involved in the necessary protein transition. For banks to take their **catalytic role**, in their capacity as financiers, **banks could mobilise capital towards innovations in the food system**, financially and strategically support farmers and primary producers in the transition process, and engage with large clients such as food, dairy and meat companies and supermarkets to encourage them to shift their business models.
- The EU and the Dutch government are already taking initiatives to stimulate the protein transition. The effectiveness of these policies could be increased if banks are effectively encouraged to play a catalytic role. Targeted measures to let banks take up their responsibility in the transition process could include:
  - ✓ Defining **long-term goals** for the protein transition, creating a **stable investment climate**;
  - ✓ Introducing **specific financial instruments** to mobilize much higher **private investments**;
  - ✓ Including **criteria in financial regulation** which are linked to the protein transition; and
  - ✓ Introducing policies that **ensure a fair, somewhat higher price for animal-based protein products**, thereby **lowering the risks** of the financing of, and investments in, plant-based protein products.

## Analysis of the current instruments and available finance

The current financial instruments are not utilized in the pilot ecosystem to a large extent. This is mainly due to the fact that the ecosystem is at early development stage, while the financial instruments target more mature business. Overall, the amount of potential investment cases is low in the pilot ecosystem. For the reason, the public sector organizations do

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<sup>49</sup> <https://fairfinanceguide.org/media/496986/dutch-banks-and-the-protein-transition-ebw-210521.pdf>

not have to the date an experience of analyzing and providing finance to sustainable protein ecosystem (only individual cases).

- In the primary production, no instruments are available to support sufficiently the transition from single crop production to more diverse protein crop production, or for testing new types of (protein) crops. There is a clear need to develop public financial instruments that can support the pilot ecosystem's objective to improve sustainable protein raw material production nationally.
- Large industrial scale factory investment e.g. in protein isolate production would strongly need public sector participation in financing the investment. Currently there are no stakeholders publicly involved in planning and building this factory in Finland, so there are no detailed information available of the investment need.
- Currently SDG impacts and thematic investments (e.g. in sustainable protein) are not truly part of public sector financing organizations practices and investment screening.
- Public finance available to the ecosystem is considered to be scattered and difficult to understand/utilize from user perspective. In the public sector, thematic/sector approach is missing (no specific mandate, objectives, and processes) and public financial organizations do not collaborate sufficiently to create a functioning funding funnel from early stage to later stages.

A key bottleneck in access to finance is the low bankability of potential investment cases. As the ecosystem is still at early stage of the development, many cases are quite small and companies in the ecosystem lack a track record.

## 3.5 Ecosystem investment portfolio

### Potential investment cases in the ecosystem

In the ecosystem, investments are needed in parallel and holistically in the whole value chain to boost the ecosystem to the next level – in addition, key bottlenecks are related to large industrial scale factory investments.

Future investment cases in the ecosystem include:

#### a) Primary production (agriculture, protein crop production)

Primary production in Finland does not currently provide sufficient quantity of protein crops. The primary production of protein crops is low in Finland, e.g. the combined share of green peas and field beans of total crop production was only 1.3% in 2019<sup>50</sup>.

Local protein crop production is needed to provide high-quality and local raw materials. Finnish primary production should focus more on farming a diverse set of plants instead of cultivation of a single crop. The success of Finnish plant-based

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<sup>50</sup> Lampinen, M., Voutilainen, E., Mattila, O., & Nordlund, E. (2021). Proteiiniklusterilla vauhtia kansalliseen yhteistyöhön: Ekosysteemimalli käytännön toteutuksena. VTT Technical Research Centre of Finland.

sustainable protein ecosystems depends on the availability of raw materials. In addition, Finland could improve its export of raw materials to global market, which grows fast due to increased global demand for alternative protein products.

The investment need relates largely to a broader topic of sustainable agricultural transition. Agriculture should better take into account the challenges related to climate change and loss of biodiversity. Key challenge is to change the existing practices and mindsets of stakeholders involved in the primary crop production.

#### **b) Industrial-scale protein isolate production plant**

Currently Finland imports protein isolate from abroad. Building a local production plant for protein isolate is a key bottleneck identified in the ecosystem, and shared with multiple stakeholders. One industrial-scale protein isolate plant would be enough to scale the ecosystem from current level. If the ecosystem grows significantly in the coming decades, the need for further investment to another isolate plant could be investigated. One protein isolate production plant could have multiple production lines, e.g. one for a new type of protein isolate combining for example fiber into the isolate product, and one for more traditional isolate production.

#### **c) “Future” protein production plant**

For new types of protein production plants, e.g. algae/microbe/fungi-based protein products, new production plants are needed. Solar Foods' Solein is the first such new protein product, for which the first industrial-scale plant is now being built. Several other future protein sources are still in the development stage, e.g. algae- and fungi-based proteins. Securing investments for scaling from research and innovation to the level of a demonstration plant (EUR 10+ million level) is difficult, as these companies are usually start-ups with no track record, and they do not fulfil all the financiers' criteria. To get more investments in the future protein production plants, the public sector would need to consider how to better encourage and support the commercialization of research. One demonstration or pilot factory could potentially have several different production lines for different products. There are also possibilities to combine the future protein plant with the larger isolate plant, for example pea isolate and mykoprotein in different production lines.

#### **d) Production of other products from side streams**

In the production process of protein isolate, and possibly also some “future” protein products, side streams such as vegetable oils or shells/husks/hulls of protein crops are formed. These side streams can be utilized in the production of other products. This is still at a very early stage in Finland, as there is no protein isolate plant yet – the production of other products could be developed parallel to isolate production. The utilization of side streams still needs research and innovation before it's in the demonstration phase.

Currently many side streams from food industry, e.g. oat husks from the grain industry and rapeseed meal from oil production are used in energy production. There could also be other potential uses of grain husks, such as in bioprocessing, as they would be good growth media for microbes. Side streams from oil plants could also be used

in the food industry, but also in other sectors such as skin care products or food supplements.<sup>51</sup>

### Investment need in the ecosystem

The investment need in the ecosystem can be divided in three parts:

- 1) **Investments in the primary production:** the total investment need is scattered as it comes from large number of individual smaller investment needs, i.e. from individual farms and agricultural businesses. There are different sizes of stakeholders included in the ecosystem and the estimation of the total investment need is difficult. The estimated amount of investment needed to boost primary production of protein crops is approximately 10-15 million euro<sup>52</sup>. The finance should target supporting farmers by sharing risk when moving to new crop, scaling the production, etc.
- 2) **Investments in industrial scale factory investments:** The ecosystem needs a factory that would produce protein isolate in Finland. The financing need of this first factory is estimated to be 10-15 million euros<sup>53</sup>. In addition to protein isolate, factory scale investments are also needed for utilizing alternative protein sources e.g. algae, mushrooms, etc. The investment to this type of plant is approximately the same 10–15 million euros, and several factories could be needed to cover all future protein sources, if they cannot be processed in the same plant. However, to reach a bigger industrial scale (with also significant export potential to other countries), the needed investment for one plant (either isolate or future protein) can reach the level of 20–50 million euros. The total investment need for industrial scale factory investments could then amount to approximately 40–150 million euros, or more, depending on the number of factories needed.
- 3) **Investments in start-ups and companies scaling the solutions:** Finland has increasing amount of innovative start-ups entering the field of sustainable protein. These companies require funding to grow and scale. Successful companies can attract venture capital funds, but when these companies grow further, availability of right public financial instruments is important. For example, a too low Technology Readiness Level (TRL) can prevent start-ups from getting financing in the current system.

### Ecosystem potential to attract sustainable finance

Current bottlenecks, such as lack of availability of funding options for start-ups that are aiming for commercialization of research, lack of thematic focus of funding to food/protein production in public financing institutions, and the scattered nature of primary production, make it difficult for the ecosystem to currently attract sustainable finance in larger quantities. Also, sustainable protein production or the food sector is currently not included in EU taxonomy,

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<sup>51</sup> Törmä, K., Aalto, H. (2018). Elintarviketeollisuuden sivuvirrat ja niiden hyödyntäminen Suomessa. Seinäjoki University of Applied Sciences.

<sup>52</sup> According estimate by pilot ecosystem stakeholders.

<sup>53</sup> According estimate by pilot ecosystem stakeholders.

which is going to be a major driver for sectors to attract sustainable finance. However, solutions can be found to overcome these barriers. These are presented below in section 3.7.

### 3.6 SDG impact and disclosure

The vision (section 3.2) highlights the wide possibilities to deliver sustainability impacts through sustainable protein production. Production of plant-based proteins or future protein sources can be considered a **multi-impact investment** because it affects the sustainability of agricultural production and increases income possibilities of food producers, improves public health, advances responsible consumption and production of food, and also affects the environment by using the ecosystem more sustainably. Protein production advances directly **SDG 2 – Zero hunger, SDG 3 – Good health and well-being, SDG 12 – Responsible consumption and production and SDG 15 – Life on land**, but the solutions impact also several other SDGs (Figure 17).

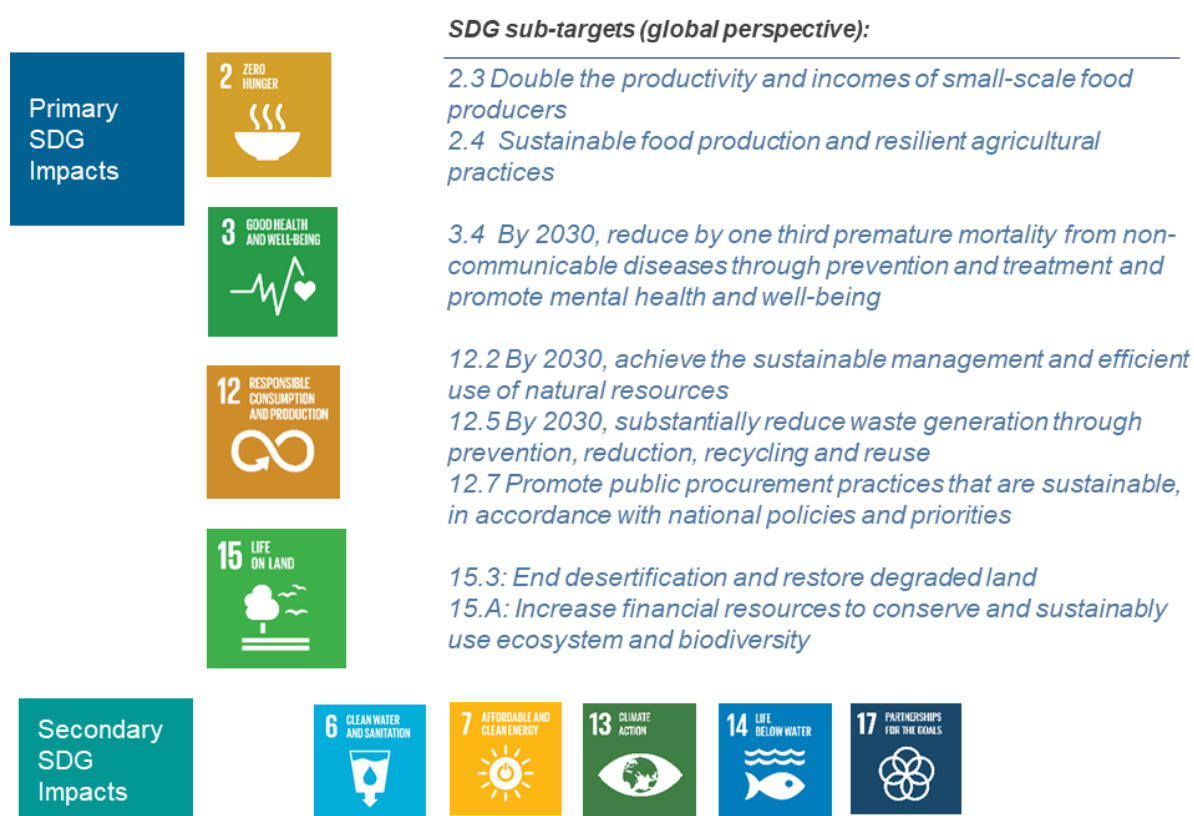


Figure 17. The primary development impacts delivered through investments in sustainable protein production are linked to SDG 2, SDG 3, SDG 12 and SDG 15, with the sub targets providing a useful framework for refining target setting and reporting.<sup>54</sup> However, in many cases multiple secondary impacts can be achieved but need to be defined and monitored in a tailored manner. In this case SDG 13 (and its sub targets) on climate mitigation and adaptation impacts are also important, but there are no clear sub-targets of SDG 13 related to protein production.

<sup>54</sup> <https://sdg-tracker.org/> and <https://sdgs.un.org/goals>



When considering a suitable methodology and indicators to measure sustainable protein - related SDG impacts for financial institutions as well as the public and private sector, it is critical to understand the country context and the raw material used for protein production (protein crops, grains, microbes, algae, etc), which can vary widely from each other regarding SDG impacts in developed and developing countries. This allows identifying suitable key performance indicators (KPIs<sup>55</sup>) that help explain and disclose how the investment contributes to certain SDGs, and hence strengthen credibility of the SDG alignment of the investment case. For primary production of (protein) crops, FAO has created several approaches and guides for SDG impact tracking, such as the “Guidance on core indicators for agrifood systems -Measuring the private sector’s contribution to the Sustainable Development Goals”<sup>56</sup>. From the indicators listed in the UN SDG website<sup>57</sup> and the SDG tracker<sup>58</sup>, combined with the FAO core indicator list, the following KPIs can be gathered as relevant for the Finnish sustainable protein ecosystem, from which the ecosystem actor can select the relevant KPIs for their actions (Table 4).

*Table 4. Selection of relevant KPIs for the sustainable protein production ecosystem actors*

SDG 2.3: % of local procurement (of crops / protein isolate etc)
SDG 2.4: Proportion of agricultural area under productive and sustainable agriculture
SDG 2.4: Habitat area protected, created or restored
SDG 3.4: Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease
SDG 12.2: Material footprint, material footprint per capita, and material footprint per GDP
SDG 12.5: National recycling rate, tons of material recycled (related to production of new products from sidestreams)
SDG 15.3: Soil degradation ratio
SDG 15.5 Sustainable use, conservation and restoration of biodiversity practices (% of biodiversity loss avoided or reduced)
FAO: A.3.1 Green investment (in EUR / %)
FAO: A.3.3 Total expenditure on research and development (of new protein products)
FAO: A.4.2 Fair pricing and transparent contract practices (e.g. in contract farming)
FAO: A.5.3 Financial risk management practices
FAO: B.1.1 Water recycling and reuse
FAO: B.3.1 Greenhouse gas emissions (scope 1)
FAO: B.3.2 Greenhouse gas emissions (scope 2)
FAO: B.3.3 Greenhouse gas emissions (scope 3)
FAO: B.9.2 Food waste
FAO: C.5.2 Percentage of sales of nutritious food
FAO: D.3.1 Management of economic, environmental, social, and institutional risks through due diligence

<sup>55</sup> KPIs are quantitative measures that allow tracking of the change of their value over time in order to demonstrate an improvement (or the lack of it).

<sup>56</sup> Tools and indicators for food and primary production of crops: [FAO-related Sustainable Development Goals](#) , [Tracking progress on food and agriculture - related SDG indicators 2021](#) and [Guidance on core indicators for agrifood systems - Measuring the private sector’s contribution to the Sustainable Development Goals](#)

<sup>57</sup> <https://sdgs.un.org/goals>

<sup>58</sup> <https://sdg-tracker.org/>

As noted above, a number of useful tools are available to help build capacity, accelerate the overall improvement of SDG impact tracking and reporting and generally refine the SDG impact case of Finnish sustainable protein production. The recommendations for this pilot ecosystem (see next section 3.7) as well as for other pilot ecosystems have identified a common need across various sectors to build SDG impact tracking capacity, and major potential to benefit from better coordinated efforts between public sector funding agencies that are in the process of refining their SDG strategies and/or impact tracking approaches (see chapter 6.1 highlighting ecosystems specific and cross-cutting recommendations).

### International case example: Triodos Bank

Triodos Bank has developed an impact framework around three pillars and its investment strategy targets companies with positive impacts in these SDG aligned investment areas. Under the pillars are four core investment themes.



The fund links measurable SDG outcomes to following KPIs that are used to monitor impact at the portfolio level. For each target SDG, the fund annually reports the key metrics used to measure the contribution the investments have on this SDG. Examples are presented below:



Sources: <https://www.triodos-im.com/impact-report/2020/sustainable-food-and-agriculture/triodos-food-transition-europe-fund>  
<https://www.triodos-im.com/press-releases/2019/triodos-bank-calls-for-complete-change-of-food-and-agriculture-systems>

## 3.7 Key findings and recommendations to public sector

The recommendations to the public sector to advance the sustainable protein ecosystem in Finland, jointly developed in the pilot ecosystem meetings and wider workshops are presented below. The recommendations are prioritized, so that the most important recommendations from the viewpoint of stakeholders are mentioned first under each theme<sup>59</sup>. Every recommendation is linked to the relevant bottlenecks, identified above. There are recommendations linked to all of the 10 bottlenecks.

### **Recommendation 1: Accepting start-ups into research consortia in Research to Business funding applications and removing restrictions on the participation of existing companies**

Research commercializes faster when done in collaboration with companies. Research to Business support should also be suitable for companies of all sizes, including start-ups. For example, Business Finland's Research to Business funding is targeted at research institutes and ELY funding on the other hand at companies that are already making a turnover - there is no Research to Business funding available for early-stage companies (especially pre-revenue start-ups<sup>60</sup>).

Addressing bottlenecks<sup>61</sup>: 3: Research and development and 5: Early-stage business

Timing: As soon as possible / during 2022

### **Recommendation 2: Thematic Research to Business / proof-of-concept funding search in for example Business Finland, and its extension to non-researchers (e.g. start-ups)**

Sustainable food production and sustainable protein production often lag behind other topics and sectors in open funding searches and thus do not receive the necessary funding. To solve this problem, a food/protein-themed funding search would be needed, which could be implemented by e.g. Business Finland.

Addressing bottlenecks 3: Research and development, 4: Lack of isolate production and 5: Early-stage business

Timing: As soon as possible / during 2022

### **Recommendation 3: Increasing knowledge and competence through a training program for sustainable protein production**

The training program could be publicly funded, bringing together actors in the agro-ecosystem related to protein production (networks of agricultural actors, public authorities,

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<sup>59</sup> The prioritization is done according to the votes received in the ecosystem workshop on 24.9.2021.

<sup>60</sup> However, start-ups can participate in co-innovation and apply for Business Finland funding for their own projects.

<sup>61</sup> See description of bottlenecks above in chapter 3.3.2 under section "Ecosystem bottlenecks"

financiers, consumers), market knowledge, etc. The training program could also be developed on the basis of current training programs and training institutions. The training program could be run e.g. by the Helsinki University Faculty of Agriculture and Forestry at Viikki (Helsinki).

Addressing bottlenecks: 10: Increasing knowledge and competence

Timing: During 2022

**Recommendation 4: A new risk-sharing financial instrument for farmers to support the start phase and experimentation of new protein crops**

Farmers need support for experimenting with the cultivation of new protein crop varieties, which is quite high risk in Finnish weather conditions. New protein plant varieties to be tested can be e.g. pea, kidney bean, hemp, flax, lupine, buckwheat, canola, rapeseed or protein crop varieties typically cultivated in other countries such as soybeans and quinoa. The financial instrument could be similar to a product development loan, in which the state participates in risk-sharing if the cultivation experiment fails. An option would be also to re-direct an existing financial instrument for this purpose.

Addressing bottlenecks: 1: Primary production and 2: Current support models

Timing: During next government programme (2023-)

**Recommendation 5: Developing early-stage risk financing options (venture capital) and demonstration phase funding options**

From the point of view of a start-up and a company struggling with investment risk, public funding is often not available in the current situation. For example, obtaining Business Finland's support for early-stage companies has been found to have become more difficult over the past five years. To address this challenge, more public sector venture capital funding would be needed, which would be willing to take risks (e.g. first loss) and not operate only on market terms. However, this type of funding is currently increasingly available – e.g. Business Finland Venture Capital Oy has made a 20 million EUR investment in Nordic FoodTech VC, which provides venture capital financing for early-stage companies. Most pressing need is for the next stage financing, e.g. for demonstration phase projects for companies that wish to access international markets (roughly 5 million EUR per company).

Addressing bottlenecks: 5: Early-stage business

Timing: During 2022

**Recommendation 6: Financial risk sharing and expert support service financing for the novel food process**

Novel protein foods, such as laboratory-based forms of protein, must be authorized as a novel food before they enter the food market, to ensure their safety. The safety is assessed by the European Food Safety Authority (EFSA) and the marketing authorization is finally issued by a European Commission decision. One risk in the development of novel foods is that they do not pass the approval process, despite going through a complicated process with relatively high costs (approximately 1-1.5 million EUR in total, estimated by a pilot ecosystem participant). A new type of financial instrument could be developed for risk-sharing,

where not all costs or risks would be borne by the novel food developer. However, the development of the instrument should take into account that the company applying for authorization should be responsible for the legality and safety of its products. The financial instrument could also partially support, for example, the use of expert services in the application process.

Addressing bottlenecks: 3: Research and development

Timing: As soon as possible / during 2022

### **Recommendation 7: Increasing contract farming, closer cooperation between primary production and industry**

Contract farming is already a familiar and widely used concept in Finland, for example in grain production, and the experience gained from it could also be used to develop contract farming of protein crops. With contract cultivation of protein crops the availability of industrial raw materials can be improved and made more reliable, and it provides farmers an incentive to increase the area under cultivation. The public sector actors could encourage contract farming for example by increasing and sharing information on its benefits and experiences from other sectors (e.g. cereals and oilseeds). In contract farming, the risk should also be better shared between industry and the farmer, for example about the potential harvest failure. In order to develop contract farming in terms of risk sharing, stakeholders could come together, for example chaired by the Grain Cooperation Group (VYR ry), and to consider the possibilities of risk sharing, taking into account, for example, consumer and frameworks provided by competition law. Recognized producer and industry organizations<sup>62</sup> could also play a role in the development of contract farming.

Addressing bottlenecks: 1: Primary production

Timing: During 2022

### **Recommendation 8: Public funding for the first domestic protein isolate plant**

The current lack of protein isolate production in Finland (or the other Nordic countries) is a major bottleneck for domestic sustainable protein production, as all protein isolate needs to be imported. The first isolate plant could be at least partly funded by the public sector, to enhance domestic production and also for creating future export opportunities for the Finnish products. For example Tesi or Climate Fund (Ilmastorahasto) could be potential public financing sources for such pilot plant. The isolate plant would help the creation of a wider sustainable protein ecosystem in Finland.

Addressing bottlenecks: 4: Lack of isolate production

Timing: During 2022

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<sup>62</sup> <https://www.ruokavirasto.fi/yrokset/tuet/tuottaja--ja-toimialaorganisaatiot/>

### **Recommendation 9: Strategic cooperation between public sector donors and between financial instruments**

The theme of sustainable protein production is not very well featured in the current pipelines of public funders. To address this challenge, better and more strategic coordination between different public funding institutions, coordination of funding criteria, pipeline coordination and management and common priorities for sustainable finance would be needed. A common steering group would be needed to address these topics of strategic cooperation. Attention is also needed to monitor and evaluate the implementation of the agreed funding criteria. The strategic cooperation could include e.g. creating a “funding path” for companies moving to the next phase (e.g. from piloting to commercialisation).

Addressing bottlenecks: 6: Industrial-scale investments and 7: Organisation of public funding

Timing: During 2022

### **Recommendation 10: Develop public procurement skills to increase public demand for sustainable protein production**

New public procurement skills are needed for innovative procurement of new plant-based/future protein products or a new, more sustainably grown protein product for use in public food services. There is a need for public sector policies, for example at municipal, provincial and national level, to promote the utilization of sustainable protein sources in public sector procurement.

Addressing bottlenecks: 8: Lack of demand

Timing: During 2022

### **Recommendation 11: Thematic pilot experiments and funding rounds**

The public sector could fund thematic pilot experiments for new food innovations, such as new types of protein products. Funding could be provided, for example, through a thematic research and innovation program, see for example the Hiilestä kiinni – Catch the carbon research and innovation programme to produce climate-sustainable land use solutions<sup>63</sup> by the Ministry of Agriculture and Forestry of Finland.

Addressing bottlenecks: 1: Primary production and 5: Early-stage business

Timing: As soon as possible / during 2022

### **Recommendation 12: A more equitable geographical distribution of ELY support within the country in terms of protein crop production**

In the current situation in Finland, there is the least amount of ELY<sup>64</sup> support available to areas with the most potential for protein production. Support for the different regions should

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<sup>63</sup> <https://mmm.fi/en/-/hiilesta-kiinni-catch-the-carbon-research-and-innovation-programme-to-produce-climate-sustainable-land-use-solutions-extensive-call-for-applications-now-open>

<sup>64</sup> ELY = Centre for Economic Development, Transport and the Environment

also take into account their potential and weather conditions for the production and processing of protein crops. For example, the Varsinais-Suomi region in South-Western Finland is a particularly favourable area for growing protein crops, but it is not reflected in the regional distribution of ELY support.

Addressing bottlenecks: 1: Primary production and 2: Current support models

Timing: As soon as possible

### **Recommendation 13: Thematic presentation of companies to financing institutions**

The public sector could organize thematic (food industry) presentations of commercializing research and early-stage companies in the sustainable protein production field, i.e. so-called pitching opportunities for domestic and international investors. This would help to raise the profile of the food theme in the eyes of domestic and international public and private investors and help companies access growth phase financing. One option for the thematic presentation would be a food-themed “Slush” event. The Slush<sup>65</sup> concept has promoted the development of the Finnish startup ecosystem and VC financing, so the model could be applied also for advancing the protein ecosystem. Already this year, there is a Slush-related pre-event planned for the sustainable food topic.

Addressing bottlenecks: 3: Research and development, 5: Early-stage business and 6: Industrial-scale investments

Timing: During 2022

### **Recommendation 14: Accelerators for impact-based business (e.g. thematically in the sustainable food/protein field)**

Accelerators could contribute to the development of companies' sustainability- and impact-based business skills and facilitate the positive collision of different actors (companies, organizations, financiers, consumers, etc.). Accelerators could also increase entrepreneurs' understanding of the financier's perspective and funding criteria. Public sector support and coordination could be considered for these accelerators.

Addressing bottlenecks: 9: Ecosystem visibility and 10: Increasing knowledge and competence

Timing: During 2022 / next government programme

### **Recommendation 15: Future scenario work and public funding for the scenario work**

There is an identified need for funding visionary scenario work on the protein ecosystem development beyond a few years and the centralized research derived from it, taking into account the commercial objectives. The scenario work could outline the different visions and development paths of the ecosystem (including, for example, the circular economy, carbon sequestration, biodiversity, etc.). Scenario work could also address, for example, the demand for domestic protein isolate production. The scenario work should also take into

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<sup>65</sup> <https://www.slush.org/events/helsinki/>



account the precautionary perspective, such as food safety, security of supply and the impacts of climate change to protein crop production.

Addressing bottlenecks: 3: Research and development and 4: Lack of isolate production

Timing: During 2022

**Recommendation 16: “One-stop shop” of public funding sources with finance agents who actively recommend suitable funding sources to companies**

Public funding today is scattered across different sources, under different application criteria, and is perceived as difficult to understand by potential funding applicants. “Finance agents” in the public sector could solve this problem by presenting suitable sources of financing directly to companies, on a one-stop shop basis. The agents could potentially also be suitable private sector actors. It is important to consider service design and user-friendliness in the development of such service. The agents can also help highlight the aspects of the projects that should be emphasized in the funding applications.

Addressing bottlenecks: 5: Early-stage business, 6: Industrial level and 7: Organisation of public funding

Timing: As soon as possible

## 4. Climate smart water solutions

### 4.1 Introduction to the ecosystem

Sustainable water solutions are at the core of achieving the SDGs during this decade. When looking specifically at the current gaps in achieving SDG 6 it is clear that massive investments are required, noting among other that some 30% of the global population lack safely managed drinking water services, 4.2 billion people lack safely managed sanitation services, major lacks persist in waste-water treatment and still limited improvements have taken place in water–use efficiency globally.<sup>66</sup> Simultaneously climate change is rapidly increasing the over 2.3 billion number of people living in water stressed countries, adding another level of difficulty to address existing water challenges, while also increasing in many regions the competition for, as well as conflict potential around scarce water resources. In parallel, a major part of water consumption is moving into urban areas, with estimates of the current urban water demand of 15-20% (of total water consumption) expected to increase to 30% by 2050.<sup>67</sup>

Also several international analyses identify water stress as the most pressing climate-related hazard to corporate physical assets by 2050, further stressing the importance to strengthen the climate resilience of societies in developed but in particular in developing countries. EU has through its development cooperation promoted universal access to drinking water, sanitation and hygiene (WASH), and enhanced water resources management (WRM) and governance. While water has been a key area for EU investments (EU committed €2.5 billion to the water and sanitation sector in partner countries between 2014 and 2020), water and climate will be at the core of EU external action also during this decade.<sup>68</sup>

### 4.2 Ecosystem vision

In 2018 Finland developed an international water strategy acknowledging water as a critical element for sustainable development. Finland has strong water related innovation experience and technological know-how and is well positioned to provide sustainable, climate smart water solutions globally. Integrating IT-solutions, distance monitoring, new smart water technologies into the solutions can provide considerable value added to the clients. Answering to global water related challenges, including improving of water efficiency in industrial and agricultural processes, as well as, strengthening climate resilience and developing access to improved and safe water, sanitation and hygiene (WASH) for billions of people require rapid scaling of water related solutions. Improved preparedness for droughts and floods, better management of storm waters, and reducing leaks in water grids (which present

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<sup>66</sup> See e.g. [Summary Progress Update 2021: SDG 6 — water and sanitation for all](#), March 2021.

<sup>67</sup> [WATER IN CIRCULAR ECONOMY AND RESILIENCE](#), World Bank 2021. Anna Delgado, Diego J. Rodriguez, Carlo A. Amadei and Midori Makino

<sup>68</sup> See e.g. [Water and Beyond](#) - EU transformative approaches for international partnerships. EU commission, 2021.

losses of valuable water resources and cause major financial expenses) in developed and developing countries could be achieved by the usage of climate smart water solutions tested and piloted in Finland.

Investments in responsible and sustainable water solutions provide opportunities to scale these solutions internationally. As global water investments typically are large scale and multi-stakeholder projects, the role of building attractive coalitions and collaborations, as well as availability of sufficient references is required. Individual organizations are likely to face challenges to access global markets. Investments in developing a broader ecosystem participation and collaboration can boost the availability of Finnish water solutions on the global market.

To bring stakeholders together a shared ecosystem vision was formed in the nexus of climate and water. The ecosystem vision (Figure 18) was built together with the ecosystem task force, with input sought through broader stakeholder consultations. Noting rapid evolution of the solutions<sup>69</sup> and increasing number of stakeholders getting engaged, it can be considering a “working vision” that could be refined further as the ecosystem recommendations (chapter 4.7) are being put into action.

“Through investments in this ecosystem, Finland strengthens its capacity to provide competitive and effective climate smart water solutions in emerging markets.

In line with the Finnish international water strategy and increasing commitments by Finnish companies to be the most responsible water stewards in the world by 2030, Finnish solutions address concerns of water access, efficiency, security and sustainability, and recognize the importance of collaboration between different sectors such as water, health, energy, food and forests.”



Figure 18. A vision for the climate smart water solutions ecosystem was developed with the aim to bring key stakeholders around the same table and build commitment for the required SDG transformation finance.

The ecosystem has the potential to advance several of the SDGs, in particular SDG6 and SDG 13, with multiple opportunities to contribute to several other SDGs, too. As an integral part of refining and putting into action the vision, a more detailed approach and analysis for defining, measuring and reporting the SDG impacts that are created through investments in the ecosystem is developed (see section 5.6).

<sup>69</sup> E.g., at the At Glasgow COP 26 in November 2021 Finland signed the Glasgow declaration for fair water footprints for climate resilient, inclusive, and sustainable development. The initiative aims among other to harness globalized supply chains, and the reach and influence the private and financial sectors, as well as civil society, to support sustainable water management, climate change resilience and adaptation, and realisation of the UN's Guiding Principles on Business and Human Rights

## 4.3 Pilot ecosystem overview

### 4.3.1 Pilot ecosystem focus

The pilot ecosystem focus has been defined based on stakeholder consultations conducted through multiple workshops 2020-2021 and refined in collaboration with members of the ecosystem task force during spring -autumn 2021. Following an initial overview of the pilot (Figure 19) a set of focus areas for this pilot ecosystem work was identified.

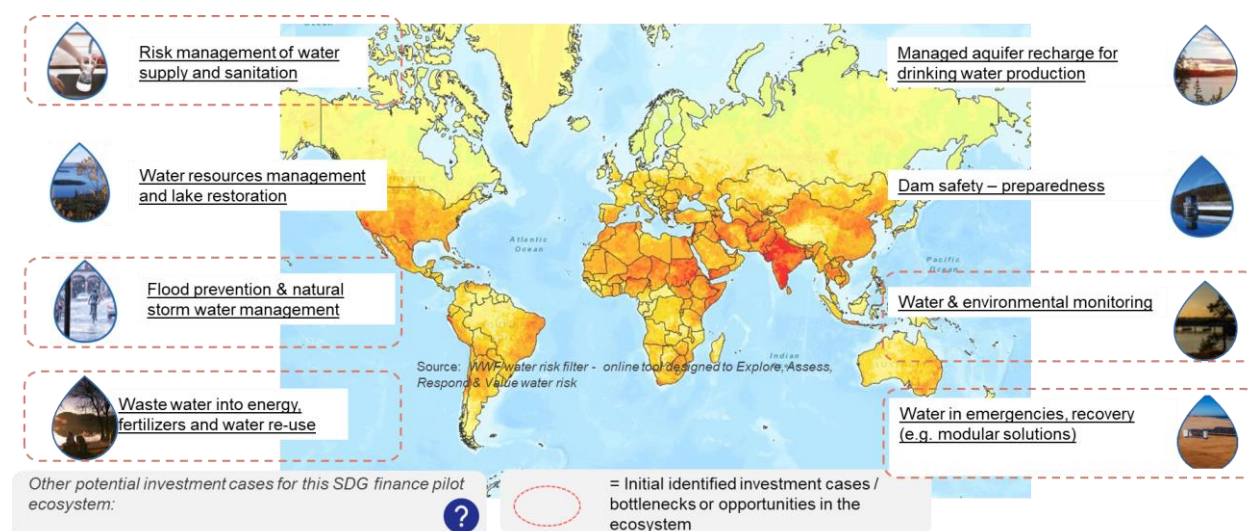


Figure 19. Finnish strongholds in the nexus of water and climate, serving as basis for prioritised themes for pilot ecosystem work (sources [FWF material on Finnish water sector strongholds](#) as well as [WWF Water Risk Filter](#)). vision for the climate smart water solutions ecosystem was developed with the aim to bring key stakeholders around the same table and build commitment for the required SDG transformation finance

The five areas cover several of the Finnish strongholds corresponding to major SDG challenges and market opportunities in emerging countries. Overall, the Finnish solutions in these themes are provided by a diverse group of public and private sector stakeholders, focussing on:

- I. Risk management of water supply, sanitation and network management
- II. Environmental monitoring and Early Warning
- III. Wastewater into energy, fertilizers and water re-use
- IV. Water for emergencies, recovery and other off-grid solutions
- V. Flood and drought prevention and natural storm water management

Many of the solutions are cross-cutting and provided in partnerships (including public -private partnerships) in consortia, also engaging local partners. The five focus areas are summarised below highlighting areas of SDG value-add.

#### I. Risk management of water supply, sanitation and network management

Water sector stakeholders have a solid track record in management of water risks in Finland, combined with increasing experiences of water solutions provided in emerging markets, which creates an interesting basis for upscaling potential internationally. In Finland, safe quality of drinking water is assured by a comprehensive risk management approach, strongly

embedded within Finnish (mainly publicly owned) water utilities. A national online platform used by more than 500 water utilities provides the utilities and also national and local authorities reliable information on most significant risks, urgent investment needs and progress of the whole sector. Multiple Finnish climate smart solutions for managing risks in water supply and sanitation are available for utilities and industries, including e.g., software for systematical risk assessment and documentation, tools and approaches for identification and prioritization of risk management actions as well as for monitoring and benchmarking of implemented risk management measures.

Particular Finnish SDG strongholds in this area include

- smart water meters, online water quality sensors and intelligent non-revenue water leak management solutions, ICT, software, AI/analytics, secure low energy data communication, low-cost ubiquitous access to meters and IoT sensor devices
- GIS (geographical information system), NIS (network information system), digital twins, cyber security, hydraulic modelling of water networks
- Asset management (maintenance, drawings etc.)

## **II. Environmental monitoring and Early Warning**

The pressures on the use of water resources are increasing rapidly, among other due to accelerating economic growth and production requirements, advancing impacts of climate change as well as rapid urbanization processes. Reliable real-time data is essential for modern water management, to better understand the water management context and water value chains, identify and monitor key risks, as a basis for developing more sustainable and cost-efficient water management solutions.

Particular Finnish SDG strongholds in this area include

- tailor-made consulting to national hydromet services, ministries, municipalities, utilities & energy companies, equipment or software manufacturers
- integrated solutions with predictive monitoring systems for comprehensive management of water resources and climate risks
- sensor networks and monitoring solutions
- analysis tools solutions (analytics, data-analytics, forecasts, machine-learning, robotics, reporting)
- integration and partner networks providing data from field to the end-user (sensors, data transfer, analysis, reporting, etc.)

## **III. Wastewater into energy, fertilizers and water re-use**

According to UN, by 2030, total global water demand is expected to exceed supply by 40% and approximately half of the world's population will suffer from water stress. Finland is a forerunner in water-related circular economy, which can help reduce pressures and resolve sustainability concerns of water use in industrial processes and agriculture, as well as increased water demand caused by intensified urbanization. These solutions can also be

provided in a climate smart manner, contributing to energy efficiency improvements and/or renewable energy production.

Current sewage treatment systems consume large amounts of energy, estimated at between 1% and 3% of global energy output, and over 20% of municipality electrical energy consumption on public utilities is used for sewage plant operations.<sup>70</sup> High capital expenses and high operational costs are major barriers to the implementation of sewage systems<sup>71</sup>, particularly in low-income countries. In addition, full implementation of currently prevailing technologies would significantly increase the negative climate impacts of wastewater treatment, with a notable rise in energy consumption.<sup>72</sup> With the help of Finnish water solutions, wastewater is used as a resource for producing bioenergy, safe fertilizers and water for industry, agriculture and municipalities.

Particular Finnish SDG strongholds in this area include

- design and planning solutions, technology & construction of modern, circular economy treatment plants
- environmental safety and energy & resource efficiency measures and operation management
- underground treatment plants for maximized land-use efficiency

#### **IV. Water for emergencies, recovery and other offgrid solutions**

Natural and manmade disasters are intrinsically linked with water. Conversely, water-related disasters pose both direct impacts (e.g., damage to buildings, crops and infrastructure, and loss of life and property) as well as indirect impacts (e.g., losses in productivity and livelihoods, increased investment risk, indebtedness, and human health impacts) to societies. The increasing economic cost and toll of disasters should be a strong incentive for governments and humanitarian organizations to focus more attention on preparedness, prevention and addressing the root causes of vulnerability.

Particular Finnish SDG strongholds in this area include

- comprehensive solutions for crisis management and WASH related challenges
- deployable, modular and scalable solutions for field camps and other temporary or permanent needs
- smart solutions for drinking and wastewater management to secure health, safety and efficiency

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<sup>70</sup> Capodaglio and Olsson, 2019, Energy Issues in Sustainable Urban Wastewater Management: Use, Demand Reduction and Recovery in the Urban Water Cycle, Sustainability 2020, 12, 266; doi:10.3390/su12010266

<sup>71</sup> According to latest data, 80% of wastewater from human activities is discharged into rivers and seas without any pollution removal, see <https://www.un.org/sustainabledevelopment/water-and-sanitation/>

<sup>72</sup> <https://iwa-network.org/tapping-the-power-of-wastewater/>

## V. Flood and drought prevention and natural storm water management

Climate change is expected to further exacerbate flood and drought risks in several regions, leading to major human and economic losses. Climate and weather-related hazards force tens of millions of people to flee their homes every year. Floods trigger just over half of these displacements, and storms more than a third. While there are region and local specific differences in the trends of river flooding, flash flooding and surface water flooding, the costs are considerable, with the estimated global losses from floods in total amounting to almost 70 USD billion between 2011-2020.<sup>73</sup>

Particular Finnish SDG strongholds in this area include

- water and flood monitoring & measurement technologies, training and capacity building support in land-use planning and flood and drought prevention design, policy development expertise related to flood, drought and disaster risk reduction (DRR).
- storm water quality management related technologies, training etc.

### 4.3.2 Ecosystem current state

While several individual success stories can be identified, and strong areas of expertise and rather exceptional strategies and platforms for national water collaboration are available, the internationalization of Finnish climate smart water solutions remain sporadic. Screening the ecosystem through the lens of the five roadmap elements, gives an overall understanding of areas in need improvement. These are briefly presented below. The barriers and bottlenecks are thereafter analysed in more detail, with recommendation for solutions included in section 4.7

#### 1) Sufficient quantity and quality of investment cases



Strengthening of the pipeline development capacities and funding for it has been broadly identified as a main area in need of improvement in the water sector. Several private sector companies, in particular SMEs are struggling to refine their solutions to suit local markets and profoundly understand what kinds of business models could create profit and SDG impact. Despite improvements in recent years, there is room for improvement in how the Finnish networks source

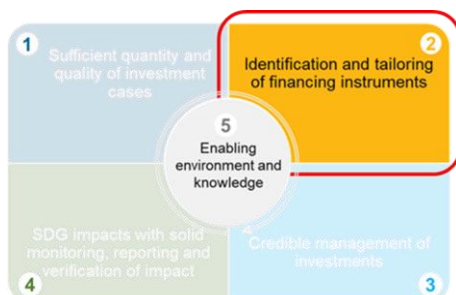
and share intelligence of SDG6 opportunities, and how Finnish actors are able to influence and lobby buyers preparing tenders and/or private purchases. A major stronghold and potential important provider of international SDG6 benefits, through climate smart water solutions, is in the hands of public utilities in Finland (see stronghold 1 above). However, the current ownership and funding structures do not provide incentives to harness this expertise

<sup>73</sup> Cumulative insured losses in 2011–2020 by secondary peril type, and primary peril totals, in USD billion at 2020 prices. sigma 1/2021 - Natural catastrophes in 2020, Swiss Re Institute



internationally.<sup>74</sup> The Finnish Water Forum, with broad national representation of water sector stakeholders is contributing to improved tracking of the pipeline quality and quantity, but stronger national collaboration, e.g. through Business Finland thematic focusing on climate smart water could help boost the pipeline of this ecosystem.

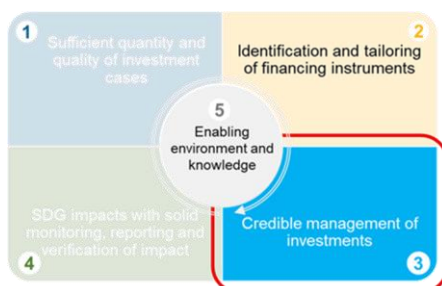
## 2) Identification and tailoring of financing instruments



While water sector stakeholders overall consider the finance ecosystem and instruments highly valuable, currently many encounter problems in accessing finance for proof-of-concept type activities, and in particular for establishing the first references in partner countries. The needs for de-risking instruments and more flexible pilot funding would enable pilot projects in which water sector actors could collaborate to build joint offerings,

and which would lead to references in selected partner countries. The Public Sector Investment Facility (PIF<sup>75</sup>) launched in 2017, while being slow in getting going, has been highly appreciated and utilized by stakeholders in this ecosystem, to help developing country partners/buyers access required funding for SDG aligned investments. Overall, stakeholders call for improved coordination and “one stop-shop” service for clearer guidance and accessing of optimal financing instruments and up-scaling pathways.

## 3) Credible management of investments

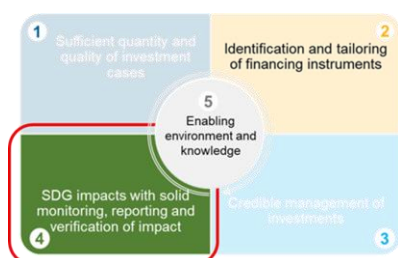


While a multitude of Finnish actors provide solutions in the critical nexus of climate and water, the diversity of these actors (e.g. their focus areas, size, internationalization capacity) can pose a challenge when building new consortia to compete for international tenders or private investments. Several bigger Finnish companies are constantly providing water solutions in developing countries, but the majority of Finnish water sector actors have difficulties in accessing that market. Further efforts are needed to identify and incentivize “integrators” that can help build climate smart water consortia in developing markets, credible enough to compete for steadily increasing (public and private) climate funding, development funding by EU and international development finance institutions, as well as major investments expected this decade in developing country water infrastructures.

<sup>74</sup> See also [New partnership- and business models for the strengthening of Finnish water expertise and businesses in addressing global water challenge](#). Publications of the Government's analysis, assessment and research activities 48/2017

<sup>75</sup> PIF is one of the finance instruments in Finland's development cooperation policy with the objective to support the public sector investments in developing countries that comply with the sustainable development goals of the UN and utilise Finnish expertise and technology

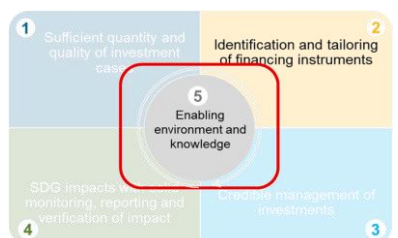
#### 4) SDG impacts with solid monitoring, reporting and verification of impact



The climate smart water ecosystem has a major opportunity to profile itself as a key 'SDG solutions provider. To date many of the approaches and indicators, used by Finnish water sector solutions providers in communicating their value-added, have been focussing mainly on technical and financial aspects. Increasingly the benefits of Finnish solutions are being demonstrated and communicated also through

SDGs, which provide an important common language for public funding agencies as well as private finance. Approaches and tools are being developed and increasingly applied by Finnish water sector stakeholders to improve their competitiveness, but a need for boosting this capacity is visible in this ecosystem.

#### 5) Enabling environment and knowledge



While Finnish water sector stakeholders have limited influence on partner country enabling environments, it is extremely important that access to solid information on country context and regulative environments is available. Several stakeholders in this ecosystem would appreciate stronger thematic support from the Team Finland network<sup>76</sup> in particular related to water solutions, both related to country context

and funding opportunities. Services and funding through Finnpartnership, and the new DevPlat (see table 5 for descriptions and funding services) have provided solutions in this regard, but could be further strengthened e.g. through a dedicated Business to Government Business (B2G Ambassadors)<sup>77</sup> with a specific focus water and climate.

#### Existing investment cases in the ecosystem

Climate smart water solutions is an "ecosystem in the making", hence there is no systematic tracking of the investments made specifically in this area. It represents, however, a rather interesting and highly potential area to create impact for Finnish water and climate solutions providers, noting the increasing pressure to address these challenges promptly. Simultaneously the international financing sector is accelerating its efforts to better understand climate risks, what is a climate resilience investment,<sup>78</sup> and how the private sector could contribute to climate change adaptation and deliver measurable SDG13 (adaptation) impacts.

With regards to risk management of water supply, sanitation, and network management successful investment cases have been demonstrated among other by companies such as

<sup>76</sup> [Team Finland](#) brings together all public internationalization services in Finland and provides businesses with services ranging from advice services to funding.

<sup>77</sup> Finland launched in June 2020 a new platform trial called Business-to-Government, "B2G". The aim of the platform is to strengthen Finnish capacity and competitiveness specifically in situations where public and supra-national players have a critical say in decision-making. While the B2G platform was set up primarily in order to promote our commercial interests, but it has a wide interface with the development goals of the 2030 Agenda.

<sup>78</sup> See e.g. [Climate Resilience Principles](#) and [The Coalition of Finance Ministers for Climate Action](#)

Nokia, KeyPro and Fluidit. Finnish products and services in environmental monitoring and early warning have provided important SDG benefits in numerous developing countries. The Finnish Meteorological Institute (FMI) has provided meteorological forecaster workstation software and forecast production systems and has to date has installed SmartMet<sup>79</sup> - systems in some 30 countries. These services have also included considerable capacity building efforts, to help ensure the national and local Met-systems provide end-to-end support for their clients, including water related risks and management. In addition to FMI, companies such as Vaisala has major international business in this area, with e.g. companies EHP Environment and Masinotek being present in emerging markets. Concerning solutions in sustainable management of wastewater and harnessing synergies linked energy production, fertilizer recovery and/or water re-use, international business cases can be disclosed by companies such as Kemira, Dewaco and Operon. In the area of water management, access and WASH solutions in emergencies and recovery periods Finnish climate smart solutions have been provided among other by companies Solar Water Solutions, Comprehend and Clewer. With regards to solutions in the area of flood and drought prevention and natural storm water management, again Vaisala and EHP Environment having solid track records on international markets.

While these solutions have not yet been tracked as “climate smart water solutions”, and some confidentiality reasons limit disclosing more detailed investment case descriptions, sizes and clients, these themes have been identified as business areas with important growth and SDG impact potential by the ecosystem stakeholders in Finland. Naturally the listing above is only indicate and not exhaustive.

### **Ecosystem bottlenecks**

Following the scoping of the ecosystem and an initial analysis of the current state of the finance ecosystem, a more detailed analyses of the bottlenecks for mobilizing investments was conducted. The main bottlenecks are described below and presented in an order that broadly reflect stakeholder views noted during pilot ecosystem work as well as stakeholder consultations and national workshop input (see Annexes I-III).

*Bottleneck 1.* References in a partner country are vital - now a key bottleneck and lack of funding solutions for them.

*Bottleneck 2.* Lack of funding for early-stage project development and the ability to carry financial risk are bottlenecks for the growth and access to further funding.

*Bottleneck 3.* Fragmentation of funding and of information about optimal funding pathways. Funding agencies should be able to make available complementary financing options and communicate about their respective roles for solutions providers in different phases of their life cycle and internationalization process.

*Bottleneck 4.* While Finnish providers of climate smart water solutions generally are highly competitive in technological and quality comparisons, there is room for development in

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<sup>79</sup> See for example <https://en.ilmatieteenlaitos.fi/international-consulting-services>

refining business models that suit the local market. Developing clearer and more targeted, and better phased growth strategies for priority developing markets, defining how to generating cash flow and SDG impact - in the shorter term as well as within the next 3-5 years – should receive more attention.

*Bottleneck 5.* Lack of ready-made concepts. The customer often wants a ready-made concept that has been thought through on behalf of the service provider. While tailoring is regularly required to close the deals, having a set of ready-made concepts are critical when aiming for scale. Having a set of tested concepts available, also facilitates the communication, sales and pitching of climate smart water solutions by the entire Team Finland network, with limited resources to focus on single SDG topics or solutions.

*Bottleneck 6:* Limited target market understanding and local partnerships hamper internationalisation. Credible presence in the target countries and local partnerships are key in understanding the customer needs and refining solutions that truly work on local markets. Valuable instruments are provided by the Finnish finance ecosystem, such as Finnpartnership and DevPlat but further support in the early stage development, co-creation and business model development would accelerate internationalisation.

*Bottleneck 7:* There is a need to improve multi-stakeholder cooperation and partnership models. There is an increasing demand for “full package” solutions, asked by developing country (public and private) buyers. Noting that most of Finnish water sector solutions providers are smaller companies, there is need to develop, test and share lessons learned of multistakeholder concepts and incentive models for bringing successfully bigger and smaller companies together as well as public and private actors. The PIF has potential to help in this regard but will not alone address the bottleneck.

*Bottleneck 8.* Ecosystem stakeholders call for more proactive tracking and “management” of request of proposals in developing countries. Many competitors have a strong presence in target countries and contribute to the preparation and planning of major public investments. Timely and proactive monitoring of calls for tenders and raising awareness of opportunities at national level will allow operators to better position themselves and also to develop joint offers.

*Bottleneck 9.* Readiness to demonstrate the SDG value-add of Finnish climate smart water solutions remains limited and/or is not harnessed. Finnish water solutions can offer many other SDG benefits in addition to the effectiveness of SDG6 & SDG13 (for example linked to food security, gender equality, livelihoods development, human security), and better demonstrating and communication of these impacts can improve competitiveness in accessing finance and contracts.

## 4.4 Analysis of current financial instruments

An overview of this finance ecosystem is presented in Figure 20.

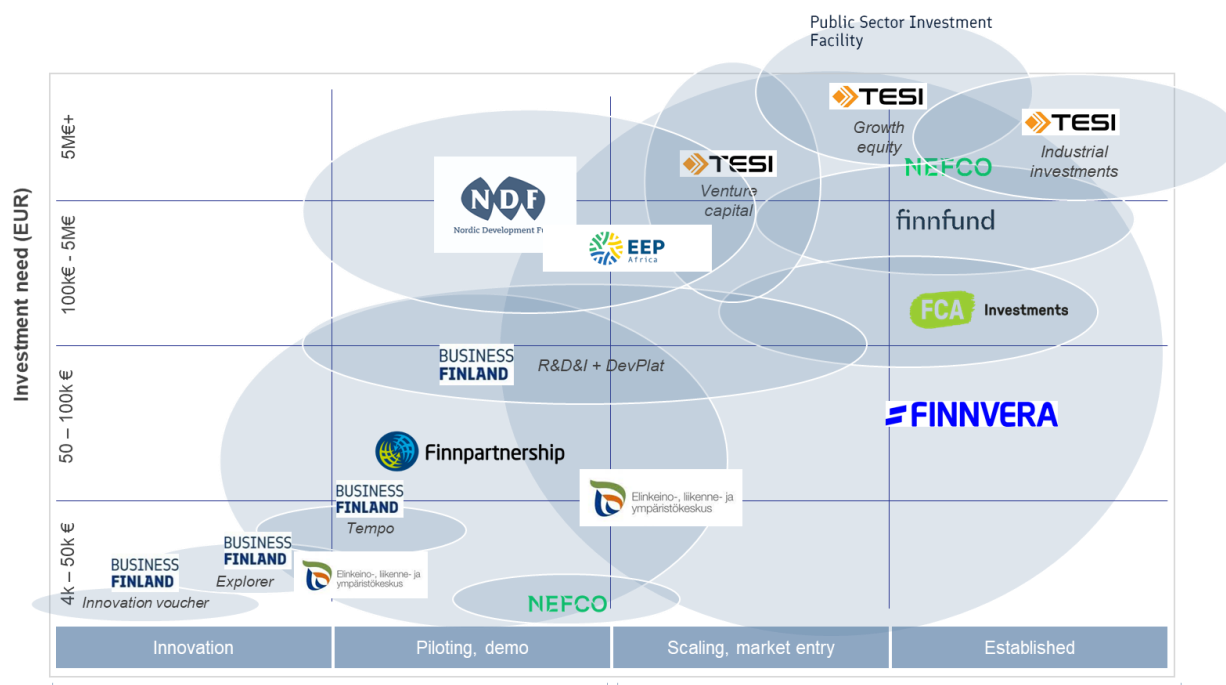


Figure 20. Overview of national financial actors related to the climate smart water solutions ecosystem

Current public financial organizations and instruments relevant to this ecosystem are presented in Table 5.

Table 5. Current public financial organizations and instruments relevant to the water ecosystem

Organization	Type	Description of the instruments / target size
Finnpartnership		Finnpartnership programme provides financial support for planning, development, piloting and training phases of projects and business activities of Finnish companies and other organizations (e.g. NGOs and research institutions) in developing countries. It also provides services related to match-making with developing country actors. The programme aims to increase commercial cooperation and promote long-term business partnerships between companies in Finland and in developing countries.  From innovation development to market entry, the ticket size can range from 1 000€ up to 400 000€.
Business Finland	Debt	For SMEs' development and piloting projects, Business Finland grants a loan covering 50% or 70% of the project's total costs. For large and mid-cap companies, the loan covers a maximum of 50% or 70% of the costs, respectively.

	Grants	<p>Business Finland also gives government assistance (grants) to e.g. research institutions and companies to commercialize their research (e.g. Research to Business finance), this includes, for example:</p> <p><b>Tempo funding</b> (intended for startups, SMEs and mid cap companies aiming for international growth)</p> <p><b>Explorer Funding</b>, including <b>Market explorer</b> funding (to fund expert services that help company gain new information and know-how regarding a new international market), <b>Talent explorer</b> funding (to hire an internationalization expert to provide new information and expertise about your target market, and promote your business in the new market), <b>Group explorer</b> (for business groups to assess joint business opportunities in export markets).</p>
Finnfund	Loans, equity, mezzanine financing or guarantees	<p>Finnfund invests in profitable business projects that advance sustainable development and are implemented by responsible businesses in developing countries. Finnfund provides loans, equity, mezzanine financing or guarantees to firms, with the goal of promoting social, environmental and economic development. Finnfund's share in new companies is always smaller than the share of the project sponsor but can be greater in expansion investments. Ticket size varies from one million to 25 million euros. Typically exit is implemented so that the project sponsor acquires Finnfund's share in the company within 5 to 7 years. Loans typically have long maturities varying from 5 to 10 years. Guarantees are defined based on the risk, amount of financing and other factors.</p>
Finnvera	Debt, guarantees	<p>Loans and guarantees as part of the agreed total financing together with other financiers.</p>
Nopef (admin by NEFCO)	Loan, Grant	<p>Conditional loan / grant for internationalization efforts (feasibility studies, pilot projects on new markets outside the EU and Nordics. 500 000€ - 5 000 000€, max 50% of total project cost, maturity up to 7 years</p> <p>Nefco is also offering fast-track green recovery financing for Nordic small and medium-sized companies (SMEs), with possible loan amount ranging from EUR 100,000 to EUR 500,000, and maturity of max. 5 years. Loans offered do not require security from the borrower</p>
Public Sector Investment Facility (PIF)		<p>The Public Sector Investment Facility (PIF) for developing countries is one of the finance instruments in Finland's development cooperation policy. Its objective is to support the public sector investments in developing countries that comply with the sustainable development goals of the UN and utilise Finnish expertise and technology.</p>

Developing Markets Platform (DevPlat)		Developing Markets Platform (DevPlat) is a joint platform of Business Finland and the Ministry for Foreign Affairs that brings together services for companies interested in developing markets and their partners. DevPlat provides information, advice, contacts and project funding related to developing markets.
TESI	Equity	<ul style="list-style-type: none"> <li>• <b>Venture capital</b> (later stage venture capital market; participating as part of a syndicate in A-C investment rounds) - Investment size EUR 2-5 million, size of investment round EUR 3-25+ million)</li> <li>• <b>Growth equity</b> (minority investments in SMEs on a strong growth path) - Investment size EUR 5-20 million</li> <li>• <b>Industrial investments</b> (major industrial companies and their investments in Finland, investments include new plants, new equipment and expansion projects)</li> </ul> <p>Investment size EUR 5-20 million.</p>
ELY-Keskus/ Centre for Economic Development, Transport and the Environment		Part of the ELY funding can be used for internationalization, help prepare market entry and/or scaling <sup>80</sup> . In addition, as part of the RFF funding, a targeted 3,5 million euro program "Growth and internationalization of water expertise" will be launched in spring 2022, making also use of the analysis and findings of this pilot ecosystem work.
NDF		NDF provides funding to climate change mitigation and adaptation activities within the nexus of climate change and development in lower-income countries. Funding is directly available to companies through NDF managed EEP (The Energy and Environment Partnership Trust Fund) linking clean energy and climate resilience objectives, in a manner that can suit climate smart water solutions providers, too.

## EU finance opportunities and international lessons learned

Next to the financial instruments provided by national funding organisations listed above on the local Finnish market, there are various finance opportunities and best-practice instruments at European and international level as well that could benefit and support the development of the Finnish climate smart water solutions ecosystem.

The most notable recently established European flagship instrument is the **Neighbourhood, Development and International Cooperation Instrument (NDICI, also called 'Global Europe')**, which is the main instrument for EU cooperation and development with partner

<sup>80</sup> [Front page - ely en - ELY-keskus](#) see in particular [\(in Finnish\)](#) and [\(in Finnish\)](#)



countries in the 2021-2027 period. In June 2021 the European Parliament adopted the NDICI budget, allocating ca €79.5 billion to be used over the next seven years to foster international partnerships on sustainable development, climate change, democracy, governance, human rights, peace and security and beyond. This budget will be backed by a maximum of €53.4 billion External Action Guarantee, with main part dedicated to developing countries, with a particular focus on Africa. The programming of the NDICI-Global Europe should be officially completed by the end of 2021, with the adoption by the Commission of geographic and thematic multi-annual indicative programming documents.

The NDICI support will allow the EU to promote public and private investment worldwide in support of sustainable development. Financial instruments, budgetary guarantees and blending operations under the NDICI will be implemented, when possible, under the lead of EIB, a multilateral or bilateral European finance institution, possibly pooled with additional forms of financial support both from Member States and third parties. These financial instruments may be grouped into facilities for implementation and reporting purposes.

While the new NDICI can provide multiple opportunities for SDG solutions with Finnish value-add, the key bottlenecks within the finance ecosystem and weaknesses among the Finnish SDG solutions providers remain just as valid, and the recommended solutions can also help better harness NDICI in scaling up Finnish SDG solutions. E.g. being able and having resources to actively participate in co-creation and defining investment needs (e.g. as part of Team Europe Initiatives) with partner countries, having access to technical assistance funding, opportunities for piloting in-situ/in-country SDG solutions, being able to demonstrate the relevance and effectiveness of your SDG solutions, remain as valid, possibly even more valid in an increasingly competitive market (for summary of bottlenecks and recommendations see chapter 4.7).

Box 5 presents an international best-practice case study on how the integrated '*landscape approach*' of the DFCD has resulted into bankable investment cases within the water sector in Namibia, Kenya and Thailand in 2020. The DFCD value chain approach, bringing various type of organisations together based on their key specialism and expertise, demonstrates the added value of ecosystem building in addressing SDG challenges. Box 6 presents another international case study, addressing a typical financing bottleneck of the lack of (sufficient) local currency finance in the water sector. Although the WFF concept hasn't resulted into concrete impact yet in Kenya (being the first NWFF pilot), due to various reasons including the pandemic, it could have a catalytic and transformational impact on the sector in terms of how private sector finance is sourced.

*Box 5. DFCD Water Facility – Climate Investor Two*

The **Dutch Fund for Climate & Development (DFCD)**<sup>81</sup> was set up in 2019 by FMO, SNV Netherlands Development Organization, World Wide Fund for Nature (WWF) and Climate Fund Managers. The DFCD **connects the project development expertise** of SNV and WWF to the **mobilizing and investment power** of FMO and Climate Fund Managers and brings them all together into **one powerhouse** for addressing SDG needs in developing countries. The **DFCD's investment strategy** focusses on **high-impact finance and projects** around climate adaptation and resilience in particular (e.g. climate-resilient water systems, water management and freshwater ecosystems, forestry, climate-smart agriculture, and restoration of ecosystems) via three separate but operationally linked facilities:

A **'landscape' strategy for deal origination and execution** has been adopted in order to actively source and **develop private sector investment opportunities** in-and-around, as well as **downstream opportunities** from own investment activities, and create a value-chain between the different facilities:

- 1) **Origination Facility [Pillar 1]**: develops project identification and (pre-)feasibility activities across the DFCD impact areas and thematic sub-sector focus. Their partner network on the ground in developing countries and among peers within the NGO and civil society community is a strong selling point.
- 2) **Land Use Facility [Pillar 2]**, targets investments in sectors relating to agroforestry, sustainable land use and climate resilient food production that have **graduated from the Origination Facility**. Next to the earmarked funding of this facility under the DFCD, FMO offers their financial instrumentation to provide growth finance via FMO's other instruments and networks with other development finance institutions.
- 3) **Water Facility [Pillar 3]**, contributes and invests in the development, construction and operational phases of water and sanitation infrastructure projects **graduating from the Origination Facility**. CFM utilizes here in the roll-out the proven fund structure of Climate Investor One and will target a Development Fund, a Construction Equity Fund and a Refinancing Fund (known as **Climate Investor Two**).

The **DFCD concept** supports various aspects and activities relevant within the context of the Finnish SDG Finance Roadmap, and the climate smart water solutions pilot in particular:

- The **landscape approach** of the DFCD by supporting potentially interesting bankable climate projects, from project development to deal origination through financial close and contracting, has proven itself by projects being contracted by the Water and Land Use Facilities after the support they received under the Origination Facility, demonstrating the added value of the value chain logic and support making **investment cases bankable against the DFCD investment criteria**;
- With DFCD being "hosted" at FMO allows the offering of **tailored financial structures** for DFCD-funded projects, as following the DFCD-contract with the Dutch government, FMO is allowed to provide loans, guarantees and equity capital from FMO's own resources to be blended with DFCD finance.

*Box 6. Water Financing Facility concept (for further information see also Annex IV)*

The **Water Finance Facility (WFF)**<sup>82</sup> is considered a **best practice and "champion"** in the water sector related innovative investment solutions being developed and tailored under the Global Innovation Lab ("The Lab"). The WFF was conceptualized by the Dutch Ministry of Foreign Affairs, in collaboration with CSC Strategy & Finance and Stafford Capital Partners and endorsed as part of the 2015-2016 Lab cycle:

- WFF mobilises **large-scale domestic private investment** from international and domestic institutional investors, such as pension funds, insurance companies and other qualified investors, by **issuing local**

<sup>81</sup> [www.thedfcd.com](http://www.thedfcd.com)

<sup>82</sup> <https://waterfinancefacility.com/>

**currency bonds** in the capital market in support of their own country's **national priority climate actions on water and sanitation service delivery**.

- WFF aims to develop **several country level water financing facilities (NWFFs)**, which can issue bond in their capital markets to provide **long-term loans** to public or private water utilities that have **little or no access to commercial finance** or that have access at unfavorable terms, such as **short tenors**.
- A **World Water Financing Facility (WWFF)** has been established as a **limited liability company** that seed-funds and facilitates the creation of national-level facilities and provides financial engineering, transaction advice, and financial management support.
- The NWFF leverage its **blended finance capital structure** to issue local currency, investment-grade bonds to domestic institutional investors. Incomes generated by (domestic) water utilities would be ring-fenced to provide **additional creditworthiness** beyond the strength of utilities own balance sheet

The **WFF concept** supports various aspects and activities relevant within the context of the Finnish SDG Finance Roadmap, and the climate smart water solutions pilot in particular:

- On the one hand, the WFF supports **private sector development** with the establishment of **special purpose vehicles (SPVs)** and access to finance of (international/domestic) institutional investors via **pooled bonds transactions**, which themselves allow **de-risking instruments** to be part of the financial deal structuring for the national water utilities;
- The national water facilities, with access to finance from international markets, are then able to invest in climate smart water solutions in their **own local currency**, which (potentially) could **catalyse private sector development** further – of climate smart water solutions – in its turn as well as a (additional) rebound effect

## 4.5 Ecosystem investment portfolio

### Potential investment cases and investment needs in the ecosystem

The climate smart water solutions ecosystem is building on an existing portfolio of smart water solutions, that are increasingly integrating climate change (both mitigation and adaptation) considerations into their solutions and business models. Some of the solutions have from the start a strong climate risk management perspective, with the aim to deliver risk management and resilience benefits to their partners and clients, with water being at the core of development benefits delivered or water related risks mitigated/managed. Based on international studies, initial estimates of finance needs in different areas are presented below. This gives an indication of the considerable market needs for different types of climate smart solutions in emerging countries (in addition to major needs in developed countries). However, as the market is only emerging<sup>83</sup>, the figures should be considered as indicative only. Future Finnish climate smart water investment portfolio could consist of e.g., of the following elements:

- 1) **Investments in risk management of water supply, sanitation and network management.** Finnish climate smart water management solutions for water utilities can improve water quality, safety and security as well as reduce non-revenue water from the water networks i.e. water losses from the network. Good water quality, safety and security is essential for potable water to ensure health and wellbeing of the people.

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<sup>83</sup> And still, only scarce commonly applied guidelines and data for tracking climate resilience finance and investments.

In city water networks (covering both developed and developing countries across), the leakages can range between 10-50% from the water flow, indicating a major need for smart solutions for detecting and reducing water leakages, also linked to considerable saving potentials in energy as chemicals consumption.

Addressing the bottlenecks in the Finnish finance ecosystem could help Finnish climate smart water solutions access a global smart water grid market that has been estimated to circa \$22 billion in 2020 (figure including both utility and industry markets) with a market growth between 6 and 18 %, depending on the segment<sup>84</sup>. According to initial estimates by Finnish stakeholders<sup>85</sup> in the short term the Finnish share could increase to hundreds of million euro within the next 5 years. While the recommendations (see chapter 4.7, e.g. (proof of- concept, reference support) suggest specific priority areas and public investments for improving the Finnish finance ecosystem, based on current data it is not yet possible to provide estimates of expected public/private leverage ratios that could be reached.

- 2) Investments in environmental monitoring and early warning solutions, combined with flood/drought prevention services.** Having access to timely, predictive and accurate information of environmental changes and pressures, including weather data, is essential for informing different stakeholders and avoiding major disruptions in key societal activities. When contamination sources are identified in real-time, quick actions can be taken to prevent any problems. When forthcoming weather extremes are predicted, adaptive measures can be taken in advance to reduce risks for economic activities, people and infrastructure – hence reducing the vulnerability of various livelihoods for environmental and climate risks. With novel sensor technologies, new parameters can be measured to improve decision-making of water resources management. Furthermore, Integration possibilities and partner networks are in an important role providing data from field to end user and can be tailored to demanding rural and urban environments. Finnish actors can also provide integrated solutions with predictive monitoring systems for comprehensive management, also at distance. While climate change is hitting hardest the most vulnerable in developing countries, in rural areas, flash floods can be prevented and/or risks mitigated with the support of advanced geological surveys, land use planning and identifying suitable areas for retention and infiltration. In urban areas, a successful solution can include thorough analysis of land use options, and e.g., increased use of evaporation areas and permeable surfaces. Finnish flood and drought prevention and risk management solutions covers monitoring & measurement technologies, training and capacity building support in land-use planning and flood prevention design as well as policy development related to flood and disaster risk reduction (DRR).

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<sup>84</sup> Frost and Sullivan 2020, Frost Radar™: Global Smart Online Water Sensor Solution Market; bcc Research 2020 Water Meters , Water Quality Sensors and Water Leak Detection: Global Markets. Frost and Sullivan, Oct 2020. Review on Big Trends 2020

<sup>85</sup> Estimates based on information by FWF.

While several international studies have noted costs of weather extremes in the ranges of tens of billions annually (see chapter 4.3.1), only in the past few years have also estimates been provided on the cost-benefit ratios of smart adaptation investments.<sup>86</sup> Referring to an illustrative adaptation investment of \$1.8 trillion in five concrete areas, many of which close to the Finnish climate smart water – strongholds, benefits in the range of \$7 trillion could be gained. Only a part of the climate smart water market could be in the reach of Finnish solutions, but the investment case is getting stronger but need to be demonstrated and communicated better by Finnish stakeholders. The recommendations (section 4.7) highlight areas in need of improvement in the Finnish finance system, including better finance for origination, which is central in fully understanding local vulnerabilities and designing climate resilient investments. On the other hand, Finnish solutions providers such as FMI and Vaisala have already gained a strong position in the early warning market, estimated in the range of some 2 billion USD (World Bank), the scaling of these solutions could provide an evident further investment focus for Finnish funding agencies, looking for SDG impact and profit.

- 3) Investments in water for emergencies & recovery and “off-grid” solutions.** Rescue and recovery from disasters and crises requires quick access to WASH. In many cases, smart, distributed solutions, for example through modular solutions can be optimal. Distributed solutions can also serve in improving access to water services in remote villages, but also in holiday resorts and in industrial applications for producing clean water and treating wastewater. Finnish innovations in water purification, wastewater treatment and recycling, together with water saving and managing solutions, can save lives in emergency and recovery settings, while also provide access to WASH in rural areas. Due to advanced renewable energy and digitalization/mobile solutions, there are increasing opportunities for innovative business models, to better harness synergies between “off-grid” water and energy solutions, in many cases also contributing to increased adaptive capacity for local people and livelihoods. Solar Water Solutions<sup>87</sup> is one example of such solutions, also highlighting an approach for a funding pathway that combines the Finnish finance ecosystem (including Business Finland, Finnpartnership/Finnfund, NEFCO) with international funding from a Dutch-based blended finance manager [Climate Fund Managers](#) (CFM, see also Annex IV) for co-financing and co-developing the installation of up to 200 desalination units in Kenya.

## 4.6 SDG impact disclosure

The vision (section 4.1) highlights the wide possibilities to deliver sustainability impacts through sustainable water solutions. Water can be considered a **multi-impact investment**

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<sup>86</sup> See e.g. <https://gca.org/about-us/the-global-commission-on-adaptation/>

<sup>87</sup> [Solar Water Solutions](#) provides small-scale, decentralised reverse osmosis desalination units powered by solar energy that can be easily integrated to use supplemental wind power or the grid during non-solar hours.

because it affects agricultural and food production, forestry, industrial chains, health, micro-climates, productivity and the environment overall. Climate smart water solutions advance directly **SDG 6 – Clean water and sanitation**, but the solutions impact also several other SDGs (Figure 21).

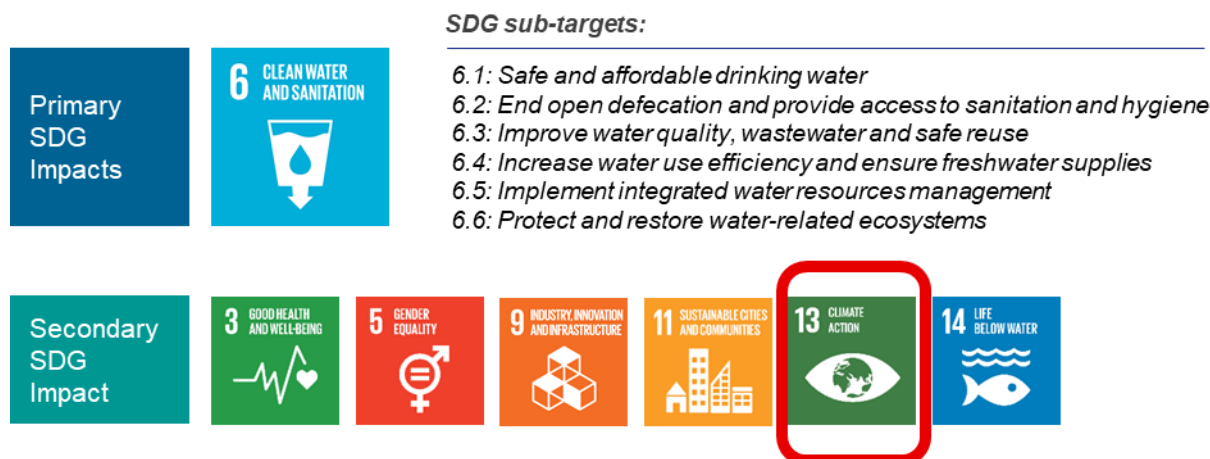


Figure 21. The primary development impacts delivered through investments in climate smart water solutions are naturally linked to SDG6 with the sub targets providing a useful framework for refining target setting and reporting. However, in many cases multiple secondary impacts can be achieved but need to be defined and monitored in a tailored manner. In this case SDG 13 (and its sub targets) on climate mitigation and adaptation impacts are integrally targeted through the Finnish climate smart water solutions.

Several tools are available to measure SDG Impact of water-related topics for financial institutions, and public and private sector. When considering a suitable methodology and indicators to measure water-related SDG impacts, it is critical to understand the emerging country context (including theory of change, impact value chains) and water solution delivered (including approach, technology and business model). This allows identifying suitable key performance indicators (KPIs<sup>88</sup>) that help explain and disclose how the investment contributes to certain SDGs, and hence strengthen credibility of the SDG alignment of the investment case.

Several existing approaches and guides<sup>89</sup> can serve the stakeholders in the climate smart water solutions ecosystem to define baselines (e.g. making use of the [SDG tracker](#) and [UN Water resources](#)), demonstrate and communicate their SDG impact potential. Figure 22 highlights a selection of potential KPIs related to water access that could directly serve some of the Finnish climate smart water solutions, both investors and solutions providers, many of which SMEs. However, noting various products and services within the Finnish climate smart water solutions portfolio, it is advisable that the final SDG impact approach and tools are tailored per investment, to ensure they best describe their full impact potential. Hence, in some cases efficiency in water use and/or water reuse, the energy intensity and carbon footprint related to water supply, or the avoided costs through early warning in weather

<sup>88</sup>KPIs are quantitative measures that allow tracking of the change of their value over time in order to demonstrate an improvement (or the lack of it).

<sup>89</sup> See e.g. the work of the Sustainable Finance Platform on [SDG 6 Impact Measurement Overview](#)

extremes, may provide more useful KPIs for smart water solutions in emerging markets than the ones presented in figure.



Figure 22. Potential KPIs for tracking and reporting SDG impacts on access to drinking water and sanitation services. Source: Natixis - *WATER ECONOMY: deciphering the challenges, financing the opportunities*.

As noted above, a number of useful tools<sup>90</sup> are available to help build capacity, accelerate the overall improvement of SDG impact tracking and reporting and generally refine the SDG impact case of Finnish climate smart water solutions. The recommendations for this pilot ecosystem (see next section 4.7) as well as for other pilot ecosystems have identified a common need across various sectors to build SDG impact tracking capacity, and major potential to benefit from better coordinated efforts between public sector funding agencies that are in the process of refining their SDG strategies and/or impact tracking approaches (see chapter 6.1 highlighting ecosystems specific and cross-cutting recommendations). A coordinated national effort on SDG6-alignment and tracking, could also have synergies with the forthcoming taxonomy requirements on sustainable use of water & marine sources.

## 4.7 Key findings and recommendations to public sector

The recommendations have been developed during the pilot ecosystem process, initiated by the ecosystem core groups, refined through stakeholders discussions as well as national workshops (see chapter 1, and Annexes), in order to gain wide insights and commitment. For each recommendation, the main bottlenecks that are being addressed are also noted as well as initial timelines for putting the recommendations in action. Noting synergies between the four pilot ecosystems, all recommendations are summarised in chapter 6, also highlighting opportunities to thematically and time-wise harness some of the main synergies.

<sup>90</sup> See e.g. the [Ceres Investor Water Toolkit](#), which helps investors with tools to evaluate water risks in their investment portfolios, or [the Water Risk Filter](#), which contains a set of tools that can be used in conjunction with WRI's Aqueduct to identify and localize water risks, including climate related risks.



### **Recommendation 1: Enhance pilot funding and finance for references in key partner countries.**

The lack of a credible reference is a major bottleneck for the breakthrough and scaling of Finnish climate-smart water solutions in emerging markets. There are a number of actors and instruments in our financial ecosystem that are working to address this problem, but they do not yet adequately fix it. Business Finland's DevPlat allows to stretch (within the framework of EU legislation) BF's funding somewhat in this direction, PIF (Public Sector Investment Facility) is beginning to deliver significant major openings in emerging markets in Asia and Africa, with NEFCO (Nopef's) feasibility funding supporting these efforts internationally. Also, additional boosting is sought by directing funding from the Recovery and Resilience Facility (RRF) in Finland to the Growth and internationalisation of water expertise - program in 2022-2023. Credible references are essential for both public and private sector clients in emerging markets, and a thematic Proof of Concept call for climate-smart water solutions could help fill the funding gap and generate strategic references in key partner countries. Overall, it is also important to look at more active linking Finland's development cooperation efforts (traditional development cooperation and increasingly significant development policy investments) with responsible business development in order to participate in reference projects with significant development impacts and scaling potential (see also Recommendations 5 and 6). Funding related to project development is also available in the partner countries, but its active utilization would require additional resources for Team Finland's operations "on the ground".

Addressing bottlenecks 1: Lacking references, and 2: Initial phase funding

Timing: asap/during project

### **Recommendation 2: Enhance multi-stakeholder cooperation and funding the development of "full-service" water solutions**

The development of multi-stakeholder cooperation and partnership models has been identified as an important means of providing competitive "full service/end-to-end solutions" in emerging markets (many clients are interested in turnkey solutions that address the clients need in a holistic manner). To date, a limited number of Finnish-led water consortia have been successful in developing countries, but as success stories are beginning to emerge it is important that experiences and lessons are shared and further refined. Bringing together different actors (including funders, private sector actors, public water utilities, NGOs and local partners) is key for developing consortia that can compete for bigger contracts and/or tailor climate smart water solutions that fit optimally the customer needs in emerging market (see also Recommendation 8). DevPlat improves the opportunities to integrate local partners in co-creation, the development of sustainable, locally tailored business models and preparation of larger scale projects. Lesson learned from e.g. BF [Growth Engine](#) work as well as other ecosystems (e.g. building international water consortia supported by FWF) provide an important benchmark for orchestrating bigger and more comprehensive solutions. A number

of bigger international Finnish companies offer opportunities to build partnerships and consortia in the nexus of water and climate solutions.<sup>91</sup>

Addressing in particular bottlenecks related to 4. Business know-how, 5 Concept creation and sales/marketing, and 7. Multistakeholder cooperation

Timing: asap/during project

### **Recommendation 3: Channel more funding for project development, increase and refine risk-sharing practices and instruments**

Several actors in the water sector see a significant funding gap between the support provided by Finnpartnership and, for example, Finnfund's funding or the PIF instrument. The instruments formed by Business Finland's (RDI) financing and DevPlat and PIF would need to be complemented by public sector risk-sharing, to help build functioning funding pathways for internationalization, e.g., through public sector venture capital with readiness to take risk (e.g. through first loss) and not purely market-based. Channeling public funding to private funds (eg funds of funds with a thematic focus) could support the development of future project flows and improved access to finance for the internationalization of climate-smart water solutions. In addition, the limited access of technical assistance funding<sup>92</sup> in the Finnish finance ecosystem, is a clear disadvantage in comparison to many peers.

Meanwhile, better coordination of existing instruments, faster (albeit oral, or preliminary or “coaching” type of) feedback systems and making use of any/all flexibilities between the instruments (such as enabling continuous application process for PIF) offer immediate potential to enhance the ecosystem already within existing mandates, but this requires better interplay between the Finnish funding agencies (see recommendation 3 below). In some cases, a narrow interpretation of BF's research funding on innovation prevents funding for potential water solutions. In terms of project development, piloting and scaling, e.g. the [Water Finance Facility](#) and [Climate Investor Two](#) can provide interesting benchmarks for required improvements in the Finnish finance ecosystem. Replicating the NDF-managed Energy and Environment Partnership (EEP) concept in the water sector (e.g. as a “Water and Environment / Biodiversity Partnership”) could also provide an interesting opportunity for addressing finance bottlenecks encountered by climate smart water solutions providers.

Addressing in particular bottleneck 3: The fragmented nature of public sector funding

Timing: asap/during project

### **Recommendation 4: A “one-stop shop” for public funding options**

Public funding is considered, by many applicants, scattered across different sources, with varying application criteria, including varying SDG alignment criteria. The provision of funding should be developed in a more user-friendly direction, where information and financing

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<sup>91</sup> E.g. in vocational education fewer potential “international growth engine” or “locomotive companies” are available for building TVET consortia for international markets.

<sup>92</sup> The smart use of technical assistance (TA) funding for project pipeline building and origination e.g. within the Climate Investor Two, can serve as an interesting comparator for the current Finnish SDG finance ecosystem.

options are more readily available and can be found in one place. The “one-stop shop” principle, would allow accessing guidance and advice on relevant funding opportunities, also thematically e.g. tailored from a climate smart water business perspective - covering key opportunities in both the domestic and international financial fields. This service could be complemented by “agents” of public funding and private sources who proactively recognize and facilitate suitable funding sources for companies instead of the current application mode, help recognize funding pathways and act as contact points for those in need of funding. The current SDG financing ecosystem in Finland offers significant potential, but without a clear and coordinated message from ownership steering, responsible for the different public funding organisations, the removal of bottlenecks and the improvement of coordination between different public funding organisations and instruments, i.e. putting into action a “One-stop-shop” is not advancing fast enough.

Addressing in particular bottleneck 3: The fragmented nature of public sector funding

Timing: asap/during project

### **Recommendation 5. Harness domestic market development and reference building opportunities through innovative public procurement**

Innovative public procurement should be used more effectively to promote the internationalization of water solutions. It is possible to harness financial players to invest in tested water solutions that are more efficient and can deliver benefits such as health, safety, employment, climate and environmental benefits. Better integration of sustainability considerations, where applicable also noting internationalisation potential as a procurement criterion, can build necessary references and further boost the internationalization of Finnish climate smart water solutions. Making use of recent national and international experiences on performance-based financing models such as SIB and EIBs, could also serve as a pathway to mobilize impact investments for better market access of innovative water solutions and to promote the scaling and export of hence tried and tested technologies. The tight private- public collaboration and various partnership models, that harness a key factor in the competitiveness of Finnish water know-how<sup>93</sup>— i.e. smooth co-operation between private, public and third sector actors in the water sector - is fully exploited.

Addressing bottlenecks related to 5 Concept creation and sales/marketing, 7. Multistakeholder cooperation and 9. SDG impact (refinement, monitoring and reporting)

Timing: during 2022

### **Recommendation 6. Host impact-driven business accelerators for project actors**

While Finnish water solutions providers showcase excellence in various water technologies and applications, there is room for improvement in business expertise, in understanding the added value for the customer and respective pay-back models, and also in many cases improvements are needed in presenting the SDG impacts of their own solution as part of the

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<sup>93</sup> New partnership- and business models for the strengthening of Finnish water expertise and businesses in addressing global water challenges, [Prime Minister's Office, 12.5.2017](#)

overall offering. Accelerator activities can help strengthen the business case and overall in building of the investment pipeline for Finnish climate smart water solutions during this decade.

Addressing in particular bottlenecks related to 4. Business know-how, and 9. SDG impact (refinement, monitoring and reporting)

Timing: during 2022

**Recommendation 7: Crystallize a national water vision among public funding agencies and deepen the thematic cooperation in climate smart water solutions**

The expertise and knowledge of water solutions business in public funding organizations is fragmented, a large part of the more traditional solutions are held by public sector actors (e.g. municipalities, water utilities) and the overall picture of financing SDG 6 water solutions and promoting internationalization is fragmented. Focusing on selected thematic areas, building on already existing national strategic commitments in the water sector (see section 4.1), offers an excellent opportunity to foster impactful cooperation between key public actors. Public sector funders and other key actors should be brought around the same table to look at the thematic opportunities, with climate smart water solutions offering a major investment potential in emerging markets, while massive (replacement) investments are also needed in Finland. The strategic co-operation should bring together representatives of key ministries and Team Finland organizations, further strengthen the good collaboration public and private sectors and research, to help more actively harness EU finance, especially the NDICI (Neighborhood, Development and International Cooperation Instrument, 2021-2027), and mobilising finance for the Finnish Africa Strategy 2021. The appointment of a B2G Ambassador focusing on water solutions (see also Recommendation 8) could enhance the implementation of these measures.

Addressing in particular bottlenecks, 5 Concept creation and sales/marketing, and 7. Multi-stakeholder cooperation

Timing: during 2022

**Recommendation 8. Developing the effectiveness of the Team-Finland network from the perspective of the internationalization of the water business.**

The internationalization of Finnish climate smart water solutions would benefit from a stronger thematic brand, allowing the entire global network of Team Finland actors, as well as Finns in international development finance institutions, to generate links and sales, and to ensure a solid understanding of sustainable business models that suit local markets and contexts. A stronger thematic focus would contribute to better tracking of investment cases and more systematic learning in this area. Few players have an overall understanding of the rapidly growing market for climate-smart water solutions and many potential customers remain undiscovered. At the same time, thin current resources do not allow the necessary proactive advocacy work in the target countries to lobby funding agencies and influence the SDG criteria of tenders, given the a priori high SDG quality of Finnish water solutions. When putting into action this recommendation, it is good to take into account recent studies and several ongoing studies and development processes, such as the ongoing development of the Business to Government (incl. B2G Ambassadors) operating model, the BF evaluation,

the Ministry for Foreign Affairs evaluation on the effectiveness of the Team Finland network, on-going discussion on possible stricter country prioritization to better promote sustainable exports and internationalization.

Addressing in particular bottlenecks related to 6. Target market understanding, and 8. Proposal (RFP and other market opportunity) follow-up and proactive management.

Timing: during 2022.

## 5. Vocational education and training

### 5.1 Introduction to the ecosystem

Lack of technical and vocational education and training (TVET) as well as insufficient quality of available education form a significant bottleneck of achieving several local and national SDG objectives, especially in developing countries. Vocational education has an important role of providing qualified workforce needed across all sectors of the economy. Overall, shortage of qualified vocational education hinders creation of new local work opportunities, development of an important SME sector, and holds back sustainable and equitable growth of economies. Vocational education plays a central role to provide an attractive educational path for youths and adults seeking to develop their skills and grow professionally to improve future employment opportunities.

Interest towards high quality TVET models has gained increased attention internationally in the recent years. **In developing countries, the vocational education scene is fragmented and faces a notable investment gap.** Improving and enabling investments in TVET will require close collaboration with local partners and provides an opportunity to build public-private-partnerships with several stakeholders, including development cooperation organization as well as Finnish private sector innovations and digital solutions.

### 5.2 Ecosystem vision

Finland has extensive knowledge and skills in vocational education and training, providing important skills for both life and work. Approximately half of the students in Finland completing their basic education continue to vocational education and training (VET). Finland has built strong national system and capabilities around TVET. Qualified and competent teachers, publicly funded system and covering all sectors of economy, has made Finnish TVET competitive in international benchmarking. Traditionally this Finnish stronghold and knowledge has not been exported to other countries at scale. However, in the past decade many Finnish TVET ecosystem stakeholders, including Finnish education institutions, have increasingly started to build capabilities, processes and offering for expanding their operations in TVET exports globally, especially targeting markets where the TVET sector is underdeveloped. This includes for example serving as a partner for local educational capacity building, developing education curricula, consultation in educational reforms, as well as, providing training programmes for different (public and private) sectors of economy internationally.

Finnish strong national experience and skills in education has also generated a large number of start-ups in all aspects of education. Education and learning technology has become globally a fast growing business area. The size of this global Edtech market is already in the same range as the Finnish state budget and the sector is growing by more than 20% a year

in terms of corporate turnover.<sup>94</sup> In Finland, there are approximately 300 Finnish Edtech companies aiming to solve global challenges related to education.

Combining long Finnish traditions, experiences and world leading capabilities in institutional TVET education with the fast growing Edtech startup field in the Finland, provides Finland an opportunity to become a key player in the global education market. The Finnish ecosystem is still at early development phase and competing in the global market is challenging. This ecosystem builds on the vision that Finland and Finnish education actors become stronger than their size in the global market, solving pressing and acute education needs globally. Investment need in this ecosystem is significant and SDG finance can play large role in boosting this ecosystem and helping it reach its vision.

To bring stakeholders together for this journey, a shared ecosystem vision was formed. The ecosystem vision (Figure 23) was built together with the pilot ecosystem task force and by seeking broader stakeholder input during 2021. The vision of this ecosystem is to expand the reach of Finnish education knowledge and solutions to markets where shortage of TVET is a significant bottleneck for local development. The vision is to build a Finnish ecosystem contributing to creation of new local work opportunities, development of strong local SME sectors and contributing to sustainable growth of developing societies. Finnish actors will have an important role in creating attractive educational paths for youths and adults to enhance their employment opportunities, lifelong learning and equitable livelihoods.

**“Through investments in this ecosystem, Finland supports vocational education solutions that provide workforce skills and qualifications needed for sustainable and equitable livelihoods and growth.**

Finland’s actions help relieve the shortage of qualified vocational education, which hinders creation of new local work opportunities, development of an important SME sector, and holds back sustainable and equitable growth of economies in Africa and Asia and other emerging markets. Vocational education plays a central role to provide an attractive educational path for youths and adults seeking to develop their skills and grow professionally to improve future employment opportunities.”



Figure 23. Vision of the vocational education and training ecosystem

Beyond the obvious impacts on quality of education (SDG4) and improved employment and growth opportunities (SDG8) this pilot may contribute directly and/or indirectly to a number of other SDGs and sub-targets, depending on the content of the education (see chapter 5.6).

<sup>94</sup> <https://edtechfinland.com/in-english/>



## 5.3 Pilot ecosystem overview

### 5.3.1 Pilot ecosystem focus

Technical and vocational education and training (TVET) ecosystem focuses on the internationalisation of Finnish value-adding solutions in the global markets, especially Africa and Asia. Overall, the potential areas of Finnish TVET export includes a diverse group of solutions, offerings and services. For that reason, it was necessary to further refine the scope of this ecosystem, in order to learn as much as possible through a set of Finnish TVET strongholds, noting that the lessons can serve also other areas, not prioritised during this exercise. Hence, the following TVET areas were identified as focus for this pilot (Figure 24):

- I. Vocational education curricula (subjects, methods, teachers' education)
- II. Vocational on-the-job training & workforce development
- III. Informal education / Life-long learning
- IV. Digital solutions and virtual learning centres.

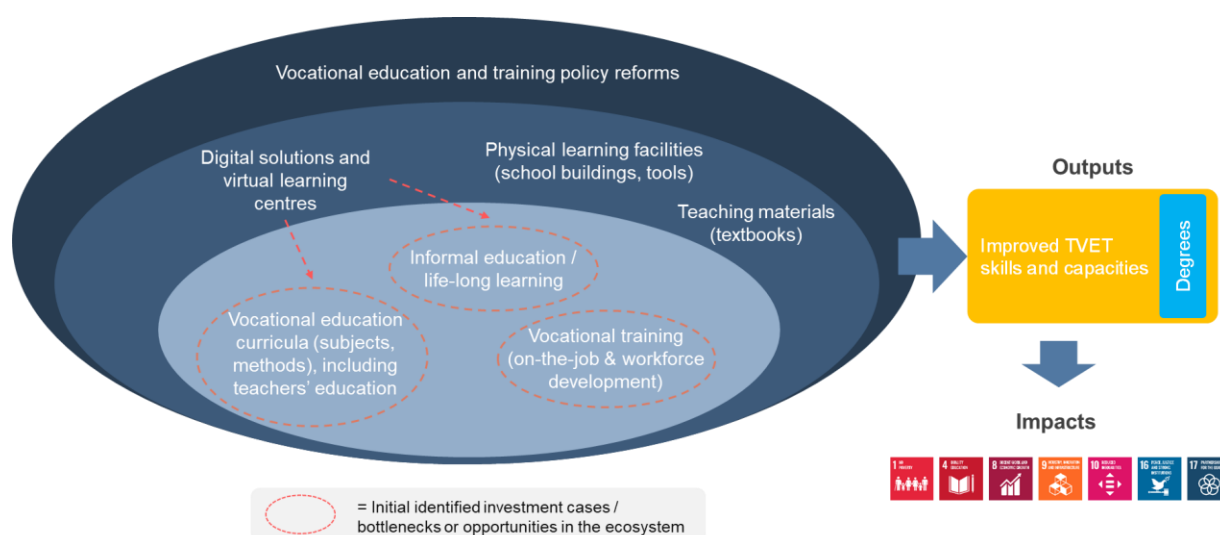


Figure 24. Focus areas in the TVET finance ecosystem

These selected focus areas are not substitutes but rather complementary with each other. Moreover, the Finnish vocational education and training sector can be roughly divided in two types of organisations: **educational institutes'** export companies, offering both formal and informal education and training; as well as a myriad of **content providers**, such as educational technology ('edtech') companies and digital services related to education, training, and employment. Below, the four selected focus areas are summarised.

#### I. Vocational education curricula (subjects, methods, teachers' education)

Technical and vocational education and training (TVET) curricula create the structure of the formal education system. The Finnish TVET system is divided into 164 vocational degrees, where the most represented fields include health and welfare (approximately 42 900

students in Finland), business administration (29 800), electrical and automation engineering (13 600), construction (13 000), logistics (12 100), automotive (10 500), as well as hotel, restaurant, and catering degrees (9 800). The solutions include e.g. national or regional TVET curricula, including subjects, methods and teachers' education, with solutions *a priori* based on Finnish know-how but tailored to match the target environment needs in developing and emerging countries. Traditionally clients have included national ministries or similar organisations in charge of organising TVET in their environment but the market is broadening with the importance of the private sector as client growing.

## **II. Vocational on-the-job training & workforce development**

On-the-job training can be a part of the formal education system or complement it in the form of workforce development. The unifying factor is that, whether the individual receiving the training is enrolled in an educational institute or a company, the learning experience is a combination of theory and learning skills in practice. On-the-job training and workforce development can be carried out as re-skilling or up-skilling existing workforce. A typical solution could be one where institutes providing formal education work together with companies to provide people with the theoretical and technical skills that support them in gaining and maintaining employment in the field that the company is focused in. As an example, Finnish educational institutes (EduExcellence) have teamed up with local partners and Nokia to support workforce development in the telecoms sector in South Africa.<sup>95</sup> The buyers can include both the company that benefits from the skilled workers, as well as the governments, ministries or municipalities that reap the benefits of social advancement resulting from workforce development.

## **III. Informal education / Life-long learning**

Informal education & life-long learning solutions include various types of education occurring outside a structured curriculum, e.g., in science parks or as individual learning. It can be provided via digital tools, such as various programming sites and language-learning applications. The value is generated when individuals learn new skills that can help them find gainful employment, hence benefiting also employers who are looking for suitable professionals. The solutions provided can include e.g. online platforms connecting individuals with courses and learning content. The buyer can either be the individual, an organisation looking to recruit new talent, or public sector actors who benefit from the improved economic activity.

## **IV. Digital solutions and virtual learning centres.**

Digital solutions for teaching vocational and technical education skills, including virtual learning centres. The solutions may include individual learning technologies, such as mixed reality solutions for teaching hands-on skills such as assembly or repair works, or online academies for ICT, language, and workplace interaction skills. These solutions can be offered as stand-alone concepts, or as part of a larger educational offering. The buyer can either be

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<sup>95</sup> <https://forge.myvcampus.com/> visited 10.5.2021

the individual, an education service provider, or an organisation looking to recruit new talent, or public sector actors who benefit from the improved economic activity.

### 5.3.2 Ecosystem current state

Finland has a reputation for providing one of the highest levels of education in the world. Finland is ranked first in the Worldwide Educating for the Future Index (WEFFI), which assesses the extent to which education systems are equipping youth aged 15-24 with the skills needed in the future<sup>96</sup>. The high level of national educational efforts and skills provides a good foundation for TVET exports. However, as noted above the industry is still rather scattered and new in Finland but presents significant potential for future growth.

The ecosystem is organized around Education Finland<sup>97</sup>, which is a governmental cluster programme supporting the best education providers in their growth on the international market. The programme is coordinated by the Finnish National Agency for Education. In 2020, the combined turnover of the member companies and organizations of the Education Finland training export program reached a total of 498 million euros (in 2019 387 million euros).<sup>98</sup>

In addition to the institutional education organizations, Finland has a growing private sector ecosystem of edtech startups. Edtech Finland<sup>99</sup> is an industry association (founded in 2019) in the field of educational and learning technology. They pursue the interests of its member companies and promote the development of the entire industry. In addition, for example, The Helsinki Education Hub, EdTech focused incubator program gathers together the best educational and EdTech innovations. The aim of Helsinki Education Hub is to combine the innovations of the learning and education sector's growth companies with Finnish pedagogic competence and academic research.

Regarding the 5 key components of Finland's sustainable finance roadmap (Figure 4), there is a solid foundation for the ecosystem growth, while also several challenges need to be addressed. At the current state, there is a gap between the TVET ecosystem and financial ecosystem, and the financial and educational actors do not know each other well. Improving this dialogue and common understanding is one of the challenges that need to be overcome but the analysis reveals also other bottlenecks, and hence also recommendations for addressing them. These are briefly presented below.

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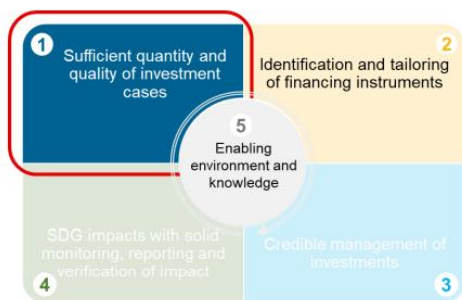
<sup>96</sup> <https://eiperspectives.economist.com/talent-education/finland-leads-second-year-globally-providing-future-skills-education-youth-according-2019-worldwide>

<sup>97</sup> <https://www.educationfinland.fi/>

<sup>98</sup> <https://www.oph.fi/fi/uutiset/2021/suomalainen-koulutusvienti-saavutti-jo-puolen-miljardin-euron-rajan>

<sup>99</sup> <https://edtechfinland.com/>

## 1) Sufficient quantity and quality of investment cases



Overall, the ecosystem has high number of potential or existing investment cases, that form a basis for investment pipeline. This pipeline can be split into two main groups: 1) Educational institution's export companies and 2) Edtech companies. Due to the low maturity of this ecosystem, the quantity of investment cases does not directly translate into investment case quality. Refining the potential pipeline into quality investment cases requires work and currently many or-

ganizations aim to create solutions and offerings that would be competitive in the global scale.

Currently here are tens of Finnish educational institutions focusing on TVET exports. Many of these organizations have years of experience as well as have provided solutions into international market. Many of them have a small organisation with only a few people in charge of coordinating export activities. Especially with larger projects such as TVET reforms or joint public-private workforce development projects, the service providers (vocational education institutes) need to be carefully selective which cases they will invest their time on. For this reason, there is no clear picture of the underlying number of international projects these organizations face and could tender annually. Global demand for these organizations is still considered high. With regards to non-formal education and digital solutions the universe of investment cases is more numerous than with TVET reforms or workforce development initiatives. Most of the approximately 300 Finnish Edtech companies are still small but aiming to grow fast in the future.

Assessing the quality of investment cases is much harder than estimating the quantity thereof. In principle, the quality of Finnish education, TVET included, is held in high regard globally. According to pilot ecosystem taskforce, translating the quality of education into quality investment cases requires first and foremost understanding of the target market, and how to tailor the existing Finnish solutions into the context of the target market. Especially in the case of vocational education programs, curricula and degrees, the content of the investment case should be adapted to fit the needs of the local economy and society.

Furthermore, producing quality investment cases requires building credible business models that investors are ready to fund. Situations where the value is generated both on individual and societal level bring a level of complexity when designing business models. The value can be generated on societal, individual, and organisational levels (especially in workforce development). Moreover, the TVET institutes that are interested in Finnish expertise can be either publicly or privately owned and operated. Additionally, the funding may be channelled through bilateral or multilateral partners. Hence, figuring out the most suitable monetization model for each case can be difficult, and this is a common challenge for developing strong investment cases. Finnish educational expertise needs to be backed by business and financing expertise for solutions to be internationally scalable. This aspect will play a key role when building quantity and quality of the investment pipeline in this ecosystem.

Building quality investment cases and service offerings is not enough – Finnish organisations need to be able to showcase references to be able to compete for the export contracts. Competitors from Germany, the Netherlands, France et cetera can compete with scale against smaller Finnish service providers. There are currently small alliances of a few Finnish educational institutes, however, the Finnish offering remains somewhat fragmented and no larger TVET consortiums with international track record exist today. This affects Finnish ecosystem ability to tender larger international projects that could be interesting part of the future investment pipeline.

## 2) Identification and tailoring of financing instruments



In Finland, organizers of vocational secondary education must incorporate commercial activities, including education exports. However, the law restricts that paid services and their development cannot be financed with state funding, which forms the core of TVET institutions' funding. This means that the schools do not have investment money, nor do they receive it through Finnish financial instruments other than for research. Hence,

product development always happens case-by-case when a customer is willing to pay for services. This is a structural challenge that also effectively prevents larger investments and participation in certain tenders, which would have the potential to reach a turnover of more than 100 million euros.

Hence, there is demand for tailoring a financing instrument that would enable product development or proof-of-concept type activities, possibly with a partner organisation. Another alternative would be looking into establishing a separate organisation that would be independent from the educational institutes and hence eligible for funding, and could then organise tenders for the Finnish TVET institutes.

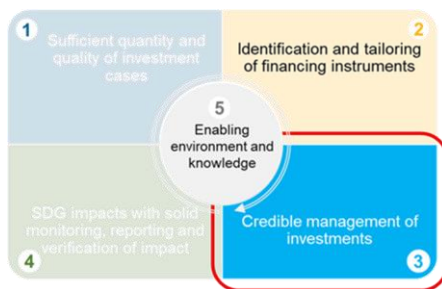
Flexible pilot funding would enable pilot projects in which different actors from Finland could collaborate to build joint offerings, which would lead to references for different organisations. Other European countries such as Germany and the UK provide funding for their companies, which can be used for piloting in target markets.

Targeting public sector clients requires different financing instruments compared to targeting private sector clients. Finnfund, for example, cannot fund publicly owned educational institutes, but can fund private sector institutions, that purchase services from Finnish service providers. The sales process aimed at private companies tends to be faster in comparison. On the other hand, a small Finnish edtech company might have difficulties in being able to sell their solution to large private sector companies.

Overall, a clarification of the financing instrument field is required – there should be a “one stop shop” where a company can visit a webpage or contact a professional with whom they could screen which funding instrument would suit the company best – whether it is managed by Finnfund, Finnpartnership, Finnvera, Tesi, Business Finland or any other organisation. This could be complemented with Business Finland's Developing Markets platform (DevPlat), which helps e.g. with international finance institutions' procurements. This would also help companies with bridging the funding between various financing instruments.



### 3) Credible management of investments



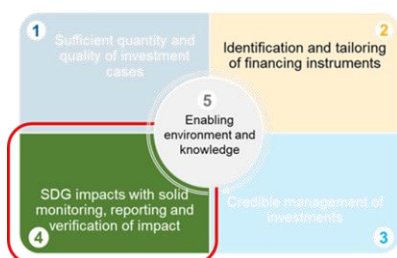
The educational field, overall, as an investment opportunity is not well known by potential providers of finance and financial organizations do not specifically cover, analyse and focus on this area. As a consequence, also the more narrow Finnish TVET ecosystem does not have strong investment managers with understanding of the area and underlying business. Educational export is still at early development stage in Finland, and from investment management point of view, the problem is lack of clear, comprehensive overview of what kind of investment opportunities and risk-return profiles the area could offer. Also, many TVET related organizations still struggle to conceptualize credible business models as well as communicate the business case and profit model for their solutions. For this reason, the potential investment universe is narrower compared to more mature investment areas.

In the recent years, however, the status of credible management of investments have improved. Today there is a growing availability of funding available for early stage business, serving especially the growing edtech sector. For example, Oppiva Invest (a state-owned special-assignment company) and Sparmind.VC (a thematic venture investor), both started their operations in 2020, focusing purely on financing the learning sector.

On the other hand, for the educational institutes' export companies, focusing to provide solutions in developing countries, the current financial ecosystem does not provide sufficient and systematic support. Some individual organizations, e.g. Finnpartnership, Finnfund and Business Finland, have been involved in this ecosystem with some existing investment cases. Overall, these organizations provide credible management of investments and have understanding and skills needed also from TVET export point of view. However, the key challenge is a high fragmentation of the finance ecosystem, with no clear focus on this area and no specific financial organization especially covering this thematic area.

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### 4) SDG impacts with solid monitoring, reporting and verification of impact



From SDG impact perspective, TVET ecosystem provides multiple SDG impacts, depending on the respective solutions offered in the target market. At the current state, the impact monitoring, reporting and verification lacks broadly applied thematic frameworks, which is largely due to the fact that there are no specific financial organizations covering this ecosystem. However, while no overarching and/or

standardised impact monitoring frameworks are yet available, a majority of ecosystem stakeholders do not consider tracking of SDG impacts a bottleneck, rather highlighting the need to ensure the consistency of SDG impact monitoring and reporting, hence taking systematically into account gender and inclusiveness aspects as well as the ultimate objective of TVET contributing to access to decent jobs

## 5) Enabling environment and knowledge



Overall, the enabling environment and national knowledge provide a good foundation for the growth and scaling of TVET ecosystem. Finland has high pedagogical knowhow, strong technology expertise, large number of actors (educational institutions, start-ups, etc.) developing and providing solutions, as well as, high quality research and networks around the topic. In addition, there are several actors who have taken an

“integrator” role in the ecosystem, namely Educational Finland and Edtech Finland. As the ecosystem is at its early development stage, key players are quite small, and only few have a track record from international markets, it is highly needed to have a integrator and coordinator to drive the sector forward and improve the collaboration of individual actors.

From enabling environment point of view, the key challenge is **to create regulative environment and public support** for this area to support its growth. In the recent years, many regulative bottlenecks area already solved. However, currently the key regulative bottleneck (see also bottleneck 7.) from finance perspective, is that **educational institution’s export companies are not classified as SMEs (or Mid-caps) when applying finance**. Export companies are separate entities and they do not receive funding from their parent companies. Despite of that, for example in Business Finland funding, these organizations are classified as large corporations due to being linked to their much larger parent organizations. This leads to a situation where these organizations lack funding options that would fit their respective size and maturity.

Second regulative challenge in the enabling environment is the **lack of possibility to use crowdfunding** (retail/individual investors). Currently, is not possible to reach out to individual investors with “impact appetite”. TVET ecosystem, as an source of social impact, could provide a good opportunity to allow and test this untapped source of finance to participate in enabling SDG impact in developing countries through personal investment.

Finally, there is a challenge to transform and complement the national knowledge and experience into an international scalable business. Many educational organizations and persons need skills in business development, building commercial concepts and offerings, and in international scaling, which would complement the high level of educational knowledge.

### Existing investment cases in the ecosystem

Multiple existing investment cases can be found both from the public sector as well as from the private sector in the Finnish TVET ecosystem. In this context, investment case can be assessed at two levels: first, an organizational level, including Finnish organizations involved in TVET exports, and second, a project level with more detailed understanding of international tenders and projects that these organizations pursue and/or have pursued. Estimating the number of existing investment cases is possible at the organizational level and is discussed below. Finnish TVET ecosystem actors have executed several projects in the developing countries in the recent years. However, the project level is more difficult to analyse as the information is fragmented in different organizations and no holistic picture exists.



There are some twenty Finnish educational institutions actively involved in the educational export. Organizations have created separate entities for their export activities. The export activity has steadily grow in the past five years. Organizations have exported solutions world-wide, including e.g. South Korea, India, China, Qatar, Saudi Arabia, Uganda, Russia.

The edtech startup scene in Finland is young and growing fast. Currently there are around 300 edtech companies in Finland. Many of these companies are also relevant from TVET perspective. Defining the number of companies focusing primarily for TVET sector is difficult to estimate. Moreover, no data exists on how many Finnish companies have been able to sell their solutions to international markets. Based on the discussions with the pilot ecosystem taskforce, there are several existing Finnish solutions with an international track record.

### **Ecosystem bottlenecks**

Following the scoping of the TVET ecosystem and an initial analysis of the current state of finance flows, the task force focused on more detailed analyses of the bottlenecks for mobilizing investments. The main bottlenecks are described below and presented in an order that broadly reflect stakeholder views noted during pilot ecosystem work as well as stakeholder consultations and national workshop input (see Annexes I-III).

#### **Bottleneck 1. Lack of references**

The lack of references of Finnish actors specifically in the international target market for TVET solutions is a major obstacle. It hinders successful participation to international public tenders, where references play a significant role to be able to successfully compete. In addition, references are needed also to credibly present a value proposition in the private sector market for TVET solutions. Available funding and support for building the first key references and supporting track record development is currently insufficient, especially considering that the TVET ecosystem is still at an early development phase in Finland. As Finnish competence in this ecosystem is still considered high in international comparisons, it is extremely important to support reference projects.

#### **Bottleneck 2. Lack of early-stage funding**

A gap has been identified for a financing instrument that would support developing proof-of-concepts or products. This lack of funding for early-stage product development and business development is a bottleneck for the growth of TVET and edtech start-ups and access to further funding at later stages. Reportedly for example German, Dutch and UK-based education service providers do receive subsidies at least for pilot phase projects, which puts Finnish players at a disadvantage.

#### **Bottleneck 3. International TVET experience and competence is limited**

Finland as a nation, the Finnish TVET ecosystem, as well as the edtech sector have high substance knowledge and skills in the education field. However, the amount of expertise and experts is limited, when taking into account the international tenders, their underlying CV requirements as well as the requirements for previous international experience. Moreover, in addition to the substance-matter expertise in the field of education, there is a need to

develop ecosystem participants' business competence to enhance financially self-sufficient and successful TVET business.

**Bottleneck 4. Lack of existing models and experience in multistakeholder cooperation**

Existing models for multi-stakeholder collaboration are still rare. Large international public tenders typically require a multistakeholder model and collaboration between Finnish, and also partner country, TVET ecosystem participants as well as potentially also the ed-tech companies. At the current state, developing multi-stakeholder cooperation is challenging, effective models and practices (e.g. financial and contractual models), “orchestrators and/or integrators” of cooperation, and lack of resources for enhancing multi-stakeholder cooperation are insufficient. In addition, the TVET and ed-tech ecosystem players do not know each other's well enough to build and package competitive overall TVET solutions at a scale and quality required in the international market.

**Bottleneck 5. Lack of conceptualization and ‘packaging’ of solutions**

Even though Finnish TVET ecosystem has a great amount of skills and solutions to be offered in the international market, there are still few “market-ready” conceptual solutions developed and available competitively for the international market. Currently, there is too much customization of offering and each new sales opportunity requires significant work and resources to tailor the solutions to fit the customer's need.

**Bottleneck 6. Lack of local understanding and contacts of the target market**

Understanding of the local context needs to be improved in order to tailor the Finnish service offering to suit the local needs better than competitors. Currently, understanding the international target market and the lack of local contacts is a common challenge for TVET ecosystem players. Successfully selling and implementing TVET solutions requires always strong knowledge of the local context, partnerships and understanding of the local key stakeholders, and ability to provide solutions that take into account the local characteristics affecting which solutions will be the best match in each case. There are clear development needs in building and better utilizing the international and existing Finnish networks for local support, sales promotion and relationship building.

**Bottleneck 7. Organizational separation of national education and TVET export business**

The education business elements should be separated from state-funded education organisations in Finland. Currently this poses a challenge to funding of education export actors. While having created separate entities for export activities, legally these export actors are considered as non-eligible for SME funding. The lack of available financing is in some cases related to how finance instruments by Business Finland are considered with regards to company size (SME definition). Finnish education service providers are treated as subsidiaries to large corporations even though the parent organisations, i.e., the vocational schools and universities of applied sciences, are not private nor generating profit. This affects crucially their ability to get funding. This bottleneck is relevant for vocational schools and universities of applied sciences. This bottleneck has been unresolved for many years and remains a bottleneck in this ecosystem.

### Bottleneck 8. Knowledge of buyers in the target markets

In the international market, the know-how of the purchasing party may be deficient and the price is often weighted in the selection, which reduces the weight of the quality of the solution and the importance of SDG considerations, a priori a Finnish stronghold, as competitive factors. The proactive influence of Finnish actors on the buyer, during the stage when tender requirements are formulated, is currently not competitive enough to ensure that (SDG) quality considerations are sufficiently noted.

### Bottleneck 9. Public funding and information is fragmented and not easily accessible

Finnish public sector financial organizations offer multiple sources for funding. However, the public funding is fragmented, information is scattered across several public sector organizations, and applying for funding is laborious in terms of different funding sources and criteria. Combining finance into a functioning “financing path” is challenging, especially for smaller companies.

### Bottleneck 10. Nature and fragmentation of the domestic educational market

Due to the lack and fragmentation of the domestic market, many start-ups in the education business are aiming directly to the world. More active development of the domestic market (e.g. through the development of know-how and thematic financing) could also strengthen the development and overall maturity of the financial ecosystem for education exports.

## 5.4 Analysis of current financial instruments

Overview of national financial stakeholder are presented below in Figure 25.

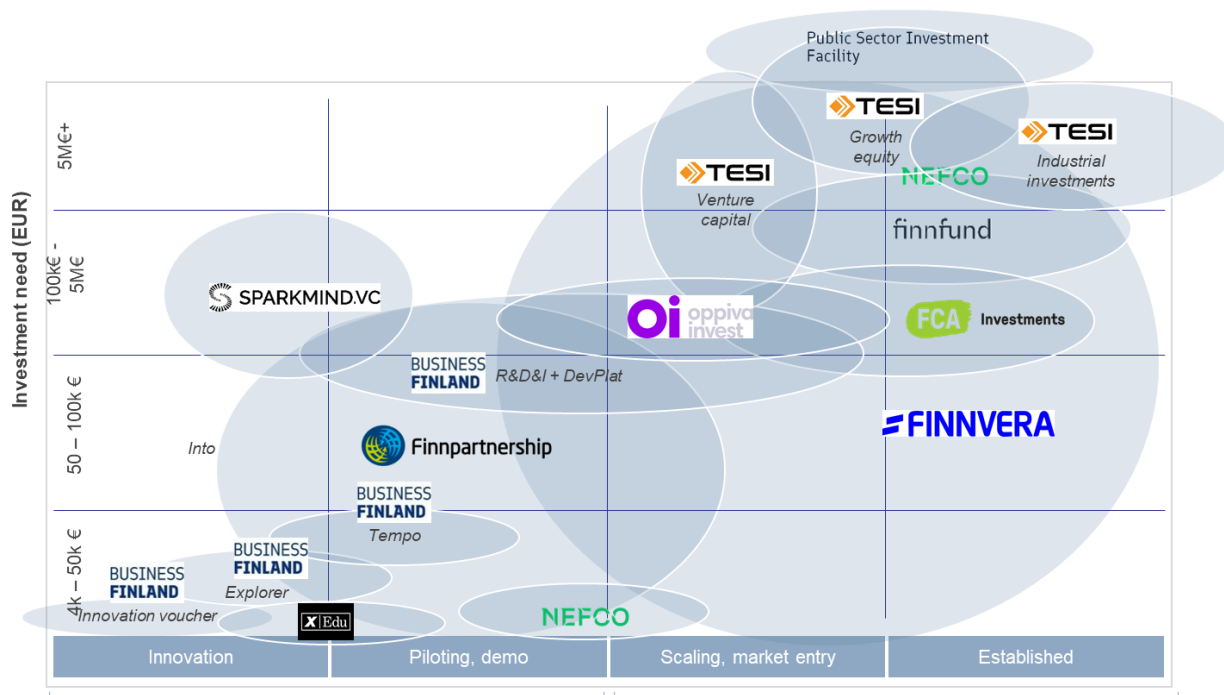


Figure 25. Overview of national financial stakeholders related to the TVET ecosystem



		<b>Explorer Funding</b> , including <b>Market explorer</b> funding (to fund expert services that help company gain new information and know-how regarding a new international market), <b>Talent explorer</b> funding (to hire an internationalization expert to provide new information and expertise about your target market, and promote your business in the new market), <b>Group explorer</b> (for business groups to assess joint business opportunities in export markets).
FCAI		<p>Finn Church Aid Investments (FCAI) is a limited liability company 100% owned by Finn Church Aid (FCA), and NGO. In August 2018 the MFA made a decision to give a €16 million loan to the FCAI. The loan is one of the new “Development policy investments” of the MFA. FCAI is an impact investor specialising in financing small and medium sized enterprises in developing countries and fragile states.</p> <p>From 100 000€ up to 1 000 000€. Investing in scale up and establishing businesses.</p>
Finnfund	Loans, equity, mezzanine financing or guarantees	Finnfund invests in profitable business projects that advance sustainable development and are implemented by responsible businesses in developing countries. Finnfund provides loans, equity, mezzanine financing or guarantees to firms, with the goal of promoting social, environmental and economic development. Finnfund's share in new companies is always smaller than the share of the project sponsor but can be greater in expansion investments. Ticket size varies from one million to 25 million euros. Typically exit is implemented so that the project sponsor acquires Finnfund's share in the company within 5 to 7 years. Loans typically have long maturities varying from 5 to 10 years. Guarantees are defined based on the risk, amount of financing and other factors.
Finnvera	Debt, guarantees	Loans and guarantees as part of the agreed total financing together with other financiers.
Nopef (admin by NEFCO)  NEFCO	Loan, Grant	<p>Conditional loan / grant for internationalization efforts (feasibility studies, pilot projects on new markets outside the EU and Nordics. 500 000€ - 5 000 000€, max 50% of total project cost, maturity up to 7 years</p> <p>Nefco is also offering fast-track green recovery financing for Nordic small and medium-sized companies (SMEs), with possible loan amount ranging from EUR 100,000 to EUR 500,000, and maturity of max. 5 years. Loans offered do not require security from the borrower</p>

Public Sector Investment Facility (PIF)		The Public Sector Investment Facility (PIF) for developing countries is one of the finance instruments in Finland's development cooperation policy. Its objective is to support the public sector investments in developing countries that comply with the sustainable development goals of the UN and utilise Finnish expertise and technology.
Developing Markets Platform (DevPlat)		Developing Markets Platform (DevPlat) is a joint platform of Business Finland and the Ministry for Foreign Affairs that brings together services for companies interested in developing markets and their partners. DevPlat provides information, advice, contacts and project funding related to developing markets.

## EU and other international finance opportunities

### *The Neighbourhood, Development and International Cooperation Instrument (NDICI)*

When looking at key frameworks and EU funding opportunities for scaling up Finnish SDG solutions in developing countries the Neighbourhood, Development and International Cooperation Instrument (NDICI, also called 'Global Europe',) is the main instrument for EU cooperation and development with partner countries in the 2021-2027 period.

In early June 2021 the European Parliament adopted the NDICI budget, allocating ca €79.5 billion to be used over the next seven years to foster international partnerships on sustainable development, climate change, democracy, governance, human rights, peace and security and beyond. This budget will be backed by a maximum of €53.4 billion External Action Guarantee, with main part dedicated to developing countries, with a particular focus on Africa.' The Commission services, together with the European External Action Service (EEAS) are currently working on the EU medium-long term planning for each country, region and thematic programme. The programming of the NDICI-Global Europe should be officially completed by the end of 2021, with the adoption by the Commission of geographic and thematic multi-annual indicative programming documents

The NDICI-Global Europe support will allow the EU to promote public and private investment worldwide in support of sustainable development. Article 27 of the NDICI Regulation provides the full list of types of financing that can be provided by the NDICI, which is in line with the forms of Union funding envisaged by the Financial Regulation. These include grants, procurement contracts for services, suppliers or works, budget support, contributions to trust funds set up by the Commission, financial instruments, budgetary guarantees, blending operations, debt relief, financial assistance, and remunerated external experts (technical assistance).<sup>100</sup>

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<sup>100</sup> REGULATION (EU) 2021/947 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 June 2021 establishing the Neighbourhood, Development and International Cooperation Instrument – Global Europe, amending and repealing Decision No 466/2014/EU and repealing Regulation (EU) 2017/1601

Financial instruments, budgetary guarantees and blending operations under the NDICI will be implemented, when possible, under the lead of the EIB, a multilateral European finance institution (e.g. the European Bank for Reconstruction and Development) or a bilateral European finance institutions (e.g. development banks), possibly pooled with additional forms of financial support both from Member States and third parties. These financial instruments may be grouped into facilities for implementation and reporting purposes.

While the new NDICI can provide multiple opportunities for vocational education SDG solutions with Finnish value-add, the key bottlenecks within the finance ecosystem and weaknesses among the Finnish TVET providers remain just as valid for accessing this funding, E.g. being able and having resources to actively participate in co-creation and defining investment needs (e.g. as part of Team Europe Initiatives) with partner countries, having access to technical assistance funding for identifying and preparing investment cases, opportunities for co-creation of and/or piloting of TVET solutions, being able to demonstrate the relevance and effectiveness of Finnish vocational education solutions, remain as valid, possibly even more valid in an increasingly competitive market (for bottlenecks and recommendations sections 5.3.2 and 5.7).

### **Analysis of the current instruments and available finance**

Currently, many TVET ecosystem organizations struggle to get funding from the public financial ecosystem. Some organizations have been able to gather small amounts of funding, e.g. from Finnpartnership and Finnfund. Overall, the funding options available are not utilized, not good fit for the ecosystem need (e.g. Business Finland, due to SME/mid-cap consideration), or the awareness of funding instruments is low (e.g. Finnvera). Lack of common understanding and language between funding and recipients is a key challenge. Financial organizations do not know the TVET ecosystem and TVET ecosystem does not know sufficiently the financial ecosystem and available funding options.

- **Finnvera** has a key role to enable larger export deals, which is currently under utilized. Currently Finnvera's financing instruments are not well known by the TVET organizations. Improving awareness of Finnvera's financing instruments and Finnvera to take active role to support this ecosystem are seen important. Finnvera could be an important partner for TVET organizations to build international business.
- **Business Finland** funding is not applicable and utilized due to educational export organizations classified as large cap organizations, instead of SMEs or mid-caps. This leads to a situation where organizations could grow only organically by income financing, which hold up significantly TVET ecosystem's potential. This would require solution from ownership steering to ensure TVET export organizations can have suitable financial instruments available.

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and Council Regulation (EC, Euratom) No 480/2009. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0947&from=EN>



- **Tesi** has invested in Sparkmind.VC through its KRR fund-of-funds. Sparkmind.VC, as a pioneering thematic investors, play a key role to support the ecosystem growth, especially related to edtech sector.

Educational organizations face a critical challenge that education, and especially TVET exports, is not sufficiently covered by any of the public sector financial organizations (other than Oppiva Invest). Financial ecosystem does not provide funding paths for recipients.

As the ecosystem, including edtech companies, is still at early stage of the development, many cases are quite small and companies in the ecosystem lack a track record. This raises the need for more risk-taking financial instruments and pilot/references funding. Edtech companies are in better position to receive venture capital if they can present sufficient business case. This applies both to public and private financing sources.

## 5.5 Ecosystem investment portfolio

### Potential investment cases and investment needs in the ecosystem

Ecosystem has already many actors that are looking for opportunities to grow their business. This pilot's investment portfolio is already today sufficiently wide, even though many actors are still quite small and lack strong track records. If the bottlenecks identified in this work can be solved, there is a strong potential for a solid SDG aligned investment portfolio. Investment portfolio can be considered to be sufficiently wide already today, and expected to become more versatile and higher quality in the upcoming years. Estimating the amounts of finance needed is challenging, due to the field being highly fragmented.

### Future ecosystem investment portfolio include:

**1) Investments in TVET export organizations, providing solutions to international markets**, including e.g. educational reforms. As stated above, currently these organizations face a crucial bottleneck that they do not receive funding from Business Finland. Many Finnish TVET export organizations are looking for more support and funding to enable their international business. To date, these actors are rather small and lack resources for larger international scaling. In addition, the financial situation might be challenging. TVET export organizations form the backbone of the future investment portfolio in this pilot ecosystem. Key actors are listed for example at Education Finland database and discussed shortly also in chapter 5.3.2 Ecosystem current state.

**Type and sources of funding:** (Equity), loan, export guarantees (Finnvera). These organisations need long term financing that would allow them to start projects in developing countries. Typically the financing solution should be already known when entering an international tender. Financing the local buyer can be crucial for a deal, which increases the need of Finnvera's involvement. The public intervention to support TVET export organizations with potential projects is needed as organizations do not easily have a risk-return profile required by commercial banks. The investment needs are major but vary considerably depending on the buyer and investment case. International large tenders can range from hundreds of thousands to tens of million euros, which would require significant resources from tenderer, including capacities and resources (including funding) for responding successfully to such tenders.

**2) Investments in edtech firms, providing digital learning solutions in vocational education.** The growing edtech scene in Finland provides an investment case into private sector actors providing solutions to global (and national) educational needs. Many of these organizations are already testing and piloting their solutions, and look for funding for market entry and international scaling.

**Type and sources of funding:** Equity, loan (depending on the company maturity). In general, organizations in this group look for venture capital funding to support their early growth and scaling of operations. Potential sources of finance include, e.g. Business Finland and Tesi. Investment need in this group reflects typical early-stage funding and funding for scaling and internationalization of digital solutions, estimated e.g. 0,5-2 million euros per case. The investment need for this category covers tens of companies and their respective financial needs to enable future growth.

**3) Finnish corporate-partnership investment cases,** with companies operating in developing countries, actively investing also to local vocational education and skills development, closely linked to their responsible business development operations. These investments are increasingly providing multiple benefits, for the companies as well as local communities, when partnerships are developed with a shared understanding of providing vocational education benefits beyond the factory and/or company gates. Several international companies<sup>101</sup> have identified the shortage of skilled labour as a major bottleneck for sustainable investments and expansion, with educational institutions locally often lacking resources, and students graduating without relevant (industry) experience, and hence in need of major on-the-job training.

**Type and sources of funding:** A priori the funding solutions required in these kinds of public private partnerships require a combination of funding solutions. The DevPlat should facilitate access to funding (grant and/or loan) for co-creation and innovation together with local partners that is central in establishing a joint vision of TVET solutions that serve the company as well as local (and possibly regional and national) education objectives today as well as in the longer term. While the company has a clear interest in investing and securing skilled labour, the Finnish (in collaboration with local) partners would benefit from better access to early-stage and proof of concept finance, allowing to build and test solid, locally adapted partnerships. Increased risk finance (VC) to edtechs would allow developing solutions sufficiently mature for TVET partnerships, with potential for major upscaling in the partner country, and possibly also in neighbouring countries. The funding need and amounts vary considerably between the available instruments and per investment case.

### **Ecosystem potential to attract sustainable finance**

This finance ecosystem is still at early stage and it lacks strong and well disclosed evidence of international track record. In addition, it is to some extent fragmented with multiple small actors and it is not well known by the financial sector. In Finland, educational business,

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<sup>101</sup> See e.g. [Stora Enso](#), [Wärtsilä](#) and [Volvo](#) as examples of Finnish & Nordic companies engaged in TVET investments in emerging markets.

especially educational institution's export activities, is not seen as a strong business area with major growth potential and investors do not know the field well.

The ecosystem has faced serious challenges to attract financing to support ecosystem's growth. However, the ecosystem has high potential to deliver SDG aligned impact, especially from the social point of view. It presents an area where Finland can have a significant handprint in developing countries. Currently, the Finnish financial ecosystem is undergoing a shift towards better SDG-alignment. So far, however, the focus has mainly been on green transition and climate change, and the social perspective, e.g. education, health, etc., are not mainstream or targeted at any scale by the financial organizations. Overall, the TVET ecosystem represents a major opportunity to create significant SDG impact, but this will require systematic efforts to boost the ecosystem's capacity to mobilize SDG-aligned investments in emerging markets.

## 5.6 SDG impact and disclosure

Technical and vocational education is generally used as a comprehensive term referring to those aspects of the educational process involving (in addition to general education) the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. The primary SDG impacts are **SDG 4 – Quality education** and **SDG 5 – Gender equality**. Due to the multidisciplinary nature, investments in TVET are linked to at least indirectly to several other SDGs as well, depending on what areas of society the TVET interventions and solutions target.

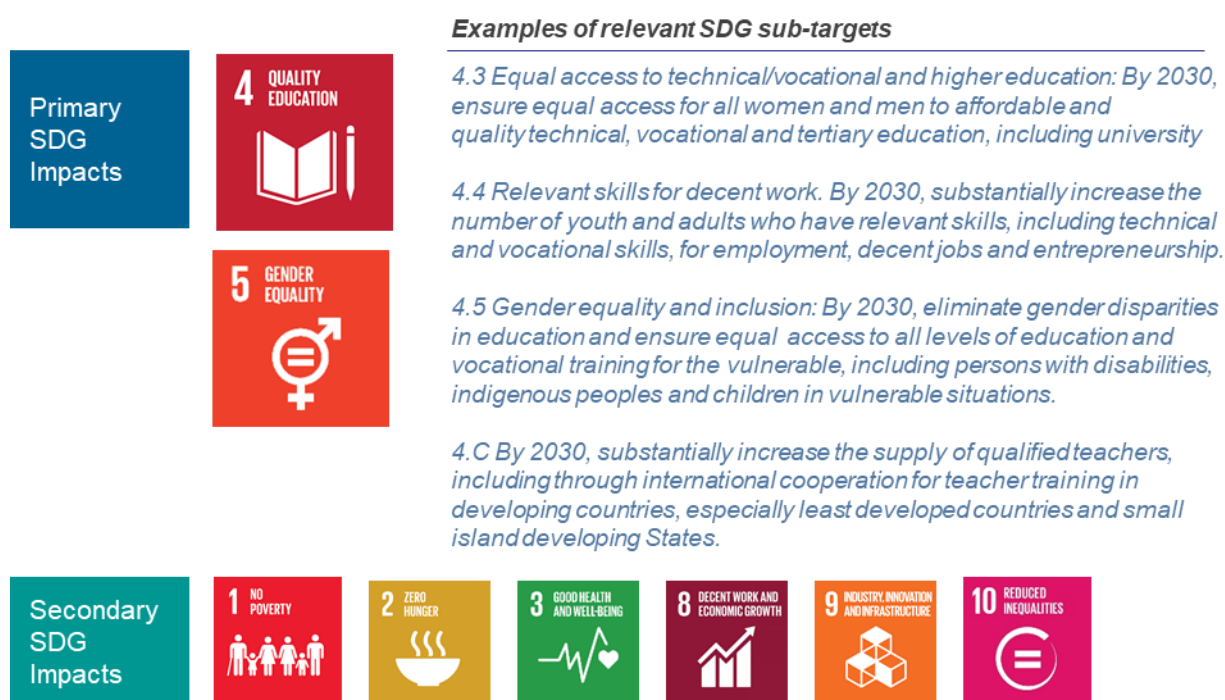


Figure 26. Relevant SDG targets for the TVET ecosystem

Some relevant KPIs for the TVET ecosystem participants are presented below in Table 7.

*Table 7. Relevant KPIs related to the TVET ecosystem*

4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex
4.4.1 Proportion of youth/adults with information and communications technology (ICT) skills, by type of skill
4.5.1 Parity indices (female/male, rural/urban, bottom/top wealth quintiles and others, such as disability status, indigenous peoples and conflict-affected, as data become available) for all education indicators

In the international context, the primary method of monitoring SDG impacts is to simply measure the number of people affected by the educational intervention. In addition, it is typical to monitor the gender balance, especially in the developing country context.

For the Finnish financial ecosystem, building the basis for measuring and communicating the SDG impact, can build on the similar way of measuring the reach and scale of solutions provided (e.g. number of students, number of programs, parity indices between e.g. female and male). TVET solutions as well as edtech solutions present a diverse group of solutions. For that reason, also their respective SDG impacts can vary significantly. Each case and its underlying impacts should be aimed to understand from SDG perspective and aim to set concrete KPIs for monitoring impacts. Measuring the scale would form the baseline for impact measurement and monitoring, and case by case more accurate KPIs can be utilized.

## 5.7 Key findings and recommendations to public sector

### **Recommendation 1. Enhance pilot funding and finance for creating references in key partner countries.**

A key bottleneck in TVET exports is the lack of references, which prevents and/or slows down Finnish actors' participation in international tenders and also the use of international financial instruments, which require evidence of previous track record. In addition to public tenders, credible references are also essential for private sector clients in emerging markets, which often constitute a market that is growing much faster and has significant SDG impact potential.

Developing new ways and instruments to fund strategic pilot projects with significant export potential and scalability, plays a crucial role in raising the Finnish TVET ecosystem's overall maturity. This could be, for example, **a thematic Proof of concept search for TVET solutions** (e.g. related to water, energy, education, etc.), open to Finnish TVET ecosystem actors and consortiums. Development of thematic areas aligning with the needs in the target market could be done in collaboration with Ministry of Foreign Affairs of Finland and/or other development financing organizations. Additionally, pilot financing instrument could also target the Finnish TVET exporters and their partnership organizations in the target countries.

New pilot financing instrument(s) could complement the positive contributions offered by DevPlat and PIF to meet current challenges in pilot financing. Developed solutions must be able to take into account, in particular, SMEs challenges related to early-stage and internationalization financing (see, for example, Nopef's recovery and feasibility study funding <https://nopef.com/>) and compliance with EU rules.

Addressing bottlenecks<sup>102</sup>: 1: Lack of references and 2: Lack of early-stage funding

Timing: As soon as possible / during 2022

### **Recommendation 2. Strengthening national coordination and strategic development of TVET skills, competences and references to build international competitiveness**

Finland has high-quality educational skills, but international competences and skills that meet the demanding CV requirements of international tenders have been identified as limited. The current TVET expertise is partly fragmented and separate in different organizations, which causes information gaps.

More efficient mapping and compilation of national know-how, competences and also existing references, as well as the identification and refinement of potential development areas, would enhance opportunities to participate in international tenders in the future. In addition, the recommendation contributes to improving the opportunities for building co-operation between actors with better mapping and coordination of existing capabilities, including also the Finnish ed-tech sector.

The solution can include, for example, to gather excellence and references in a **national TVET competence center** and to allocate sufficient funding and expertise for the development of competence levels. The competence center could also participate in facilitating the deal-flow by sharing information about tenders and enhancing collaboration of different parties.

Addressing bottlenecks: 1: Lack of references and 3: International TVET experience and competence is limited

Timing: During 2022

### **Recommendation 3. Improving multi-stakeholder cooperation and financing the concept development of Finnish TVET consortiums.**

The development of Finnish multi-stakeholder cooperation and partnership models has been identified as an important means of providing competitive end-to-end solutions in emerging markets. To date, a limited number of Finnish TVET consortia have been successful in the international market. Moreover, not all lessons from these success stories have been shared and/or refined between the ecosystem actors.

Bringing together different actors (including financing, private sector actors, public sector TVET professionals, NGOs, research institutions and local international partners) and facilitating their collaboration and co-creation, plays a key role in developing profitable and

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<sup>102</sup> See description of bottlenecks above in chapter 5.3. under section "Ecosystem bottlenecks"

business-based cooperation. These efforts must be supported and prioritized based on the SDG needs and market potential of developing countries (see also recommendation 8).

DevPlat provides nowadays better opportunities to integrate local partners into collaboration and the development of sustainable business models and project preparation. Moreover, the learnings from e.g. Business Finland Growth Engines work as well as other ecosystems (e.g. building international water consortia with the support of Finnish Water Forum, FWF) provide an important benchmark for orchestrating required end-to-end solutions in the international market.

Addressing bottlenecks: 4: Lack of existing models and experience in multistakeholder co-operation, 5: Lack of conceptualization and 'packaging' of solutions and 6: Lack of local understanding and contacts of the target market

Timing: During 2022

#### **Recommendation 4. Improved service design / “one-stop shop” for public funding options**

Public funding is currently scattered across different sources, with different application criteria (including varying SDG criteria) and is perceived as difficult to understand and reach for potential funding applicants. TVET ecosystem actors need help to better understand and exploit funding opportunities to build their own “funding path”.

The provision of financing should be developed in a more user-friendly direction, where information and financing options are readily available and can be found in one place. In the implementation of the recommendation, the so-called “one-stop shop” principle, where the person in need of funding can access the relevant funding opportunities and information through a single point. This could be complemented by “agents” of public funding sources who proactively provide suitable funding sources for companies instead of the current application model. They could also act as key contact points for those in need of funding.

Addressing bottlenecks: 9: Public funding and information is fragmented and not easily accessible

Timing: During 2022

#### **Recommendation 5. Clarification of the financial position and funding eligibilities of TVET export organizations**

Organizations engaged in the export of TVET solutions (e.g. the University of Applied Sciences) must separate their activities from the actual teaching activities. However, this has not been enough to enable new established organizations to receive financing from, for example, Business Finland, as they are considered to be large companies (EU rules on the definition of an SME) even though established organizations do not receive funding from the owner. Solution would be to classify these entities as mid-cabs.

This is a major regulative bottleneck in the development of the education export ecosystem. Determining the conditions for the organization and financing of educational exports would serve the development of the ecosystem and ensuring the operating conditions of key actors.

Addressing bottlenecks: 7: Separation of national education and TVET export business

Timing: As soon as possible / during 2022

**Recommendation 6. Boost the effectiveness of Team-Finland network for internationalization of TVET.**

Quality investment cases in e.g. the African continent are difficult to build without a strong local presence. Tailoring offerings to local context require market research and contacts, which in turn requires local presence.

Education actors would be supported by the availability and efficient use of a wider global network of Finnish and local actors. Network should generate connections and sales between actors, as well as, to promote a better local understanding of vocational training needs. Few ecosystem players have a strong overall understanding of the TVET market and local context in attractive target markets. Development of stronger network, in priority partner countries, would support the whole TVET ecosystem.

Currently, lack of resources does not allow for the necessary proactive advocacy work in the target countries, which could be used to influence the quality criteria of tenders (e.g. emphasizing good quality of Finnish solutions and their SDG impacts). In implementing the recommendation, it is good to take into account recent studies and several ongoing studies and/or investments on Finland's international role in solving SDG challenges. These studies/initiatives include for example the ongoing development of the Business to Government (incl. B2G Ambassadors) operating model, BF evaluation, the work by Ministry for Foreign Affairs, a report on the effectiveness of the Team Finland network (2/2021–5/2022), and an ongoing process on the initiative of the Minister for Development Cooperation on possible stricter country prioritization to promote exports and internationalization (see e.g. Business to Government - Development Pilot Review, Ministry for Foreign Affairs, Development Evaluation Unit, 2021/6).

Addressing bottlenecks: 5: Lack of conceptualization and 'packaging' of solutions, 6: Lack of local understanding and contacts of the target market and 8: Knowledge of buyers in the target markets

Timing: During 2022

**Recommendation 7. Innovative public procurement for market development and TVET reference building**

Finnish edtech companies need reference cases to support them in global expansion. The Finnish public sector could help produce these cases by investing in promising pilot cases where the edtech companies could showcase their solutions, which, in turn, would bring them more investment cases in global expansion.

The Finnish education system is state-funded and organized as a public good for students in different educational levels, forming a key pillar of a Nordic welfare state. At the current state, the domestic educational market in Finland does not widely use services and solutions offered by the private sector actors in the education field, e.g. edtech firms. Public procurement and applying innovative educational solutions in the Finnish education system, could offer notable potential to boost the domestic market of Finnish educational services providers.



The public sector and educational institutions, especially those that already are involved in education exports, could seek to find new educational innovations and solutions to tackle potential challenges in their own operations. This would provide an opportunity for Finnish service providers to pilot and scale their solution as well as get an important reference to support their international scaling. After the national efforts, this established collaboration between educational institutions and service providers, could be leveraged to tailor a concept for the international market. Building ways to improve collaboration and synergies between public and private sector, e.g. through public procurement, makes it possible to enable edtech start-ups and other service providers to generate references for innovative and SDG-aligned educational solutions in the home market.

Addressing bottlenecks: 10: Nature and fragmentation of the domestic educational market

Timing: During 2022

**Recommendation 8. Boost implementation of the education internationalisation roadmap and enhance thematic TVET cooperation between public sector organizations**

At present, the experience and knowledge related to the educational export in public financial organizations is fragmented. Also the overall picture of the financing of the education business and its promotion is fragmented at the national level. Education Finland, as a governmental education export programme, has a key role in enhancing Finnish solutions globally. However, there is a lack of link and strategic collaboration between all relevant public sector organizations, including financial organizations.

Focusing on education as a strategic area for SDG impact, offers an opportunity to foster more strategic cooperation between the key public sector actors. Public sector financial organizations and other key actors should be brought around the same table to look at the TVET/educational thematic area systematically and with longer time horizon. The strategic co-operation should bring together representatives of key ministries and Team Finland organizations, and **a separate thematic coordination group in the field of education** should be established in this thematic area. This coordination group should be responsible to jointly enhance the development of TVET ecosystem and share information across organizations, also contributing to better tracking of investment cases and more systematic learning in this area. In addition, the group can build a deeper dialogue between the public and private sectors.

Addressing bottlenecks: 3: International TVET experience and competence is limited and 9: Public funding and information is fragmented and not easily accessible

Timing: During 2022

**Recommendation 9. Streamline branding of educational exports versus development of international education solutions**

In the development of the Finnish SDG financial ecosystem, development needs are related to e.g. gaps/bottlenecks, cooperation between different actors and communication on existing funding opportunities. A more seamless interplay between the actors in the financial

ecosystem, which can be promoted through better corporate governance, will also help to proactively remove “unnecessary barriers” along the financial path.

At present, for example, Finnpartnership's mandate focuses on long-term co-operation, and exports are a term that is problematic from the perspective of the mandate. In this case, the term “international training business” would allow Finnpartnership to participate in the projects (taking into account that the long-term effects of the projects can be verified).

Addressing bottlenecks: 2: Lack of early-stage funding and 9: Public funding and information is fragmented and not easily accessible

Timing: During 2022

#### **Recommendation 10. Impact-driven business accelerators for TVET project actors.**

Many actors in the field of education have a strong understanding and substantive knowledge of education. However, actors may have development needs in their business expertise and in modeling, measuring and communicating sustainability and SDG impact of their own solution as part of the overall offering and value proposition.

For example, accelerator activities to develop companies' SDG impact and business skills can contribute to the formation of future deal flow and help to build functional SDG investment ecosystem around education. In addition, the accelerator would play an important role in bringing together actors in the field of education, building community and bringing them together to share lessons learned and best-practices.

Addressing bottlenecks: 3: International TVET experience and competence is limited and 4: Lack of existing models and experience in multistakeholder cooperation

Timing: During 2022

#### **Recommendation 11. Develop early-stage risk finance options and increase funding (venture capital).**

There is demand for a more flexible, risk-taking venture capital -type of financial instrument that would invest smaller amounts into a larger variety of higher-risk ventures, accepting that not all of them will be able to become profitable

From the perspective of an edtech start-up and a company struggling with early-stage investment risk, the current availability of public funding is still to some extent challenging, especially in the pre-revenue development phase. To address this challenge, more public sector venture capital funding would be needed that is willing to take risks (e.g. first loss) and not operate on market terms alone. However, this recommendation is not seen as crucial as the ecosystem already has (early-stage) financing available from Business Finland, Oppiva Invest and Sparkmind VC. Investing in and ensuring funding of existing players targeting and financing the educational field is important to ensure emerging and attractive solutions have financing available to support their growth.

Addressing bottlenecks: 2: Lack of early-stage funding

Timing: During 2022

**Recommendation 12. Raising the awareness and communication of the existing financial solutions among the ecosystem participants.**

TVET exporters often encounter a situation where, in large projects, the integration of a financing solution into international trade is necessary to provide a competitive total solution to the customer in an emerging market.

For example, Finnvera's mandate enables it to play an important role as a guarantor of long-term loans, but at present the knowledge of project participants in TVET exports about the financing solutions offered by Finnvera to the buyer is very weak and/or fragmented. Awareness of Finnvera's role as an enabler of financing solutions for education exports should be rapidly strengthened. Similarly, there are gaps among education export actors in the solutions or funding pathways provided by other domestic funders, which should provide both targeted communication and awareness and support for funding pathways.

Addressing bottlenecks: 9: Public funding and information is fragmented and not easily accessible

Timing: As soon as possible / during 2022

## 6. Conclusions and next steps

### 6.1 Main recommendations and insights from pilot ecosystems

The approach and tools developed and tested during this project have served to **systematically analyse the status of Finnish finance ecosystems, and their current capacity to mobilise SDG aligned investments**. In particular, the stepwise work within four pilot ecosystems during 2021 has enabled to identify key barriers and develop recommendations for tackling main bottlenecks and help mobilise SDG aligned private finance at required scale and pace during this decade.

In total 46 recommendations have been elaborated within the four pilot ecosystems. The recommendations have been refined stepwise over the process. In addition to the core ecosystem stakeholders, a wider group of stakeholders have also been engaged through national workshops, bilateral consultations as well as national and international interviews, in order to integrate lessons learned and experiences from forerunners (see Annexes III and IV).

The recommendations, which are presented in more detail in ecosystems specific chapters 2-5, are summarized in Figure 27, which provides a comprehensive **plan of action for accelerating SDG aligned finance through these pilot ecosystems**. The action plan contains initial timelines and phasing of required measures, with some of the recommendations being proposed for immediate action (during project period, continuing until June 2022), some for action during /by end 2022, and some to be addressed within the period of the next government programme (2023-).<sup>103</sup>

While the ecosystems were chosen with the particular objective to learn from different kinds of themes, the recommendations do have an **ecosystem specific context with some of the recommendations addressing very ecosystem specific bottlenecks**. The ecosystem specific recommendation are available and presented in more detail within chapters 2.7, 3.7, 4.7 and 5.7.

However, it is important also to note that several challenges in the Finnish SDG finance system are cross-cutting. Hence **through successful implementation of selected recommendations, certain common bottlenecks can be addressed cost-efficiently, strengthening the SDG mobilization potential of all the four pilot ecosystems**, also very likely boosting SDG aligned investments in other priority themes during this decade.

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<sup>103</sup> The phasing of the recommendations entails strategic considerations highlighted by ecosystem stakeholders, i.e. the fact that a couple the recommendations have been proposed for next government period does not automatically indicate lower priority, but rather the need to address some of the challenges on a high political level, with the support of the full government.

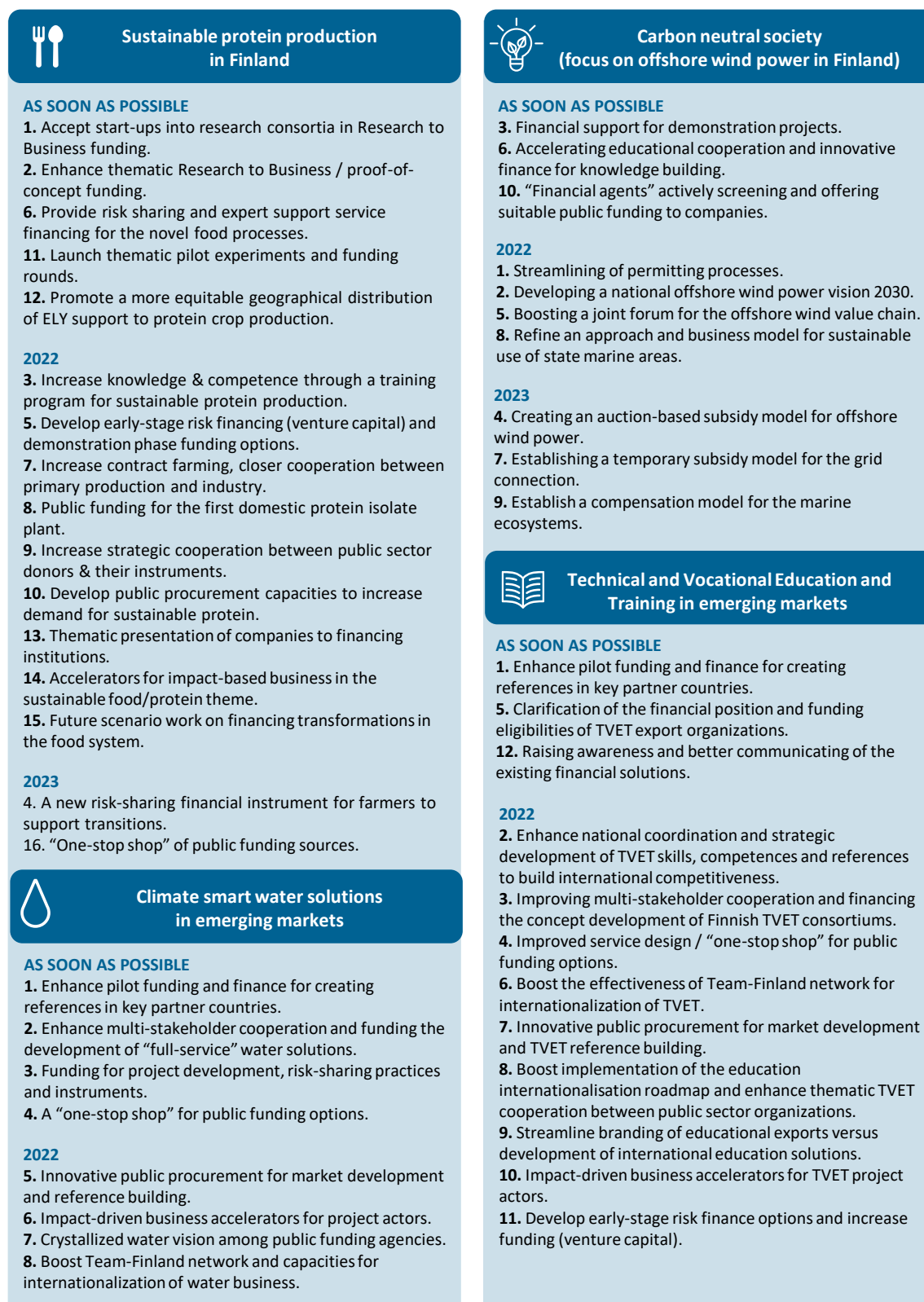


Figure 27. Recommendations have been identified for each pilot ecosystem with initial prioritisation proposed for all actions. The suggested timelines for action take note also the content and type of recommended actions.

Overall, the need to improve the coordination of public funding agencies within the Finnish finance ecosystem is recognized. While this bottleneck has been often referred to in past few years, this project provides through the four pilot ecosystems and extensive stakeholders consultations a strong argument for **advancing the “one-stop shop” approach to public funding options in Finland**. The presentation of key funding instruments on a joint “finance ecosystem map” (see Figure 10, Figure 16, Figure 20 and Figure 25) and stakeholder meetings during this project have initiated several discussions among other on possibilities for better coordination, extension of existing mandates, clearer ownership steering and communication – with ultimate goal to help SDG solutions providers to more easily identify optimal funding pathways for themselves (e.g. covering piloting, market access, scaling, internationalization etc.). The need to better link information of EU funding options as well as international funding options, is also highlighted and recommended as part of this “one-stop approach”.

Overall, the capacity and skills for tailoring and implementing **public sector de-risking instruments**, is also a cross-cutting recommendation for all four pilot ecosystems. The types and phases where such funding would be most needed varies across the ecosystems but is clearly an area where joint efforts in the Finnish finance ecosystem are required, i.e. to build skills, capacity and, where needed, ensure that the mandates of funding agencies support such blending<sup>104</sup> of public and private finance. E.g. in the cases of sustainable protein, de-risking instruments should be made available to allow Finnish farmers (dare to) make transformations in their farming crops and practices (see chapter 3). E.g. in the case of internationalization of climate smart water solutions and TVET solution, public de-risking instruments are recommended to allow piloting and creating required first references in entering emerging markets.

Another common feature across the ecosystems is the need to strengthen the capacity of both public and private sector stakeholders to better **define their SDG visions and respective impact targets** (including monitoring and reporting) in a manner that strengthens their business case, helps access finance, and identify investment cases that can deliver both SDG impacts and profit. Throughout the project period the need to **align investments with the EU taxonomy** (including issues of eligibility, alignment, DNSH) has been recognized as an important tool supporting SDG finance alignment but also a common area in need of rapid and increased attention among finance ecosystem stakeholders. The project has identified a readiness for joint learning, in some cases through capacity building, help desks, thematic SDG investment accelerators etc., coordinated nationally and supported as much as possible by joint EU initiatives, tools such as [the EU Taxonomy Compass](#). In this regard, the national Center of Expertise for Impact Investing could take leadership in boosting these capacities.

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<sup>104</sup> The analysis from the Finnish SDG finance ecosystems is aligned with international analyses, e.g. as presented in OECD 2021, [Making Blended Finance Work for Sustainable Development: The Role of Risk Transfer Mechanisms \(oecd.org\)](#)

## 6.2 An SDG finance toolkit for policy level and ecosystem specific guidance

The project has made use of initial SDG finance work conducted in Finland 2018-2019, and insights from a growing number of international sustainability initiatives in the finance sector, with many national green and/sustainable finance roadmaps seeing daylight in 2021. However, few have taken an ecosystem-wide approach in operationalizing the ambitions<sup>105</sup>.

The approach and tools in Finland have been founded on two central building blocks, with the aim to help create financing ecosystems that can produce investment pipelines of high SDG quality, that identify and serve suitable types and sizes of SDG (and EU Taxonomy) aligned finance, that help manage those investments credibly and successfully, and can transparently report and communicate of the achieved SDG impacts and profits.

Firstly, the National SDG Finance Roadmap provides the overall framework for defining all key elements that need to be in place in order to tackle the SDG finance gap in a systematic manner and mobilise private finance at required scale and pace. Hence, the national roadmap and its key elements provides a first screening tool for understanding, analyzing and defining the SDG-alignment status of a finance ecosystem. It also provides a framework for bringing relevant key stakeholders together, from public, private, civil society and research, in order to understand their respective roles in transforming the finance system.

Secondly, the process for defining and analysing the pilot ecosystems provides the essential component of the toolkit for putting things into action (see D3, chapters 2-5). By analysing in more detail the prioritized pilot ecosystems (see figure5), the key financing modalities and instruments can be identified. As noted during this project, the tailoring of required solutions and actions take place during the "deep dives" into specific pilot ecosystems, which will allow identifying key recommendations and engage key actors. In line with the lessons learned from the roadmap process, as well as the work within the four pilot ecosystems, financing modalities and instruments should not be analysed in isolation of the other key elements. The work within the four pilot ecosystems during 2021 has revealed that e.g. the importance of addressing regulative barriers and other enabling environment challenges, and/or knowledge/capacity/skills barriers may be more pressing in some ecosystems than others, and in some case no financial instruments per se can help mobilise private SDG aligned finance unless some of these other ("non-financial") barriers have been addressed.

Jointly, these building blocks form a synergetic approach and a practical toolkit for advancing SDG aligned finance on a national level, and in particular through concrete action within thematic, SDG aligned finance ecosystems. The process and steps applied during pilot ecosystem has allowed to deliver solid analysis results and recommendations in a systematic

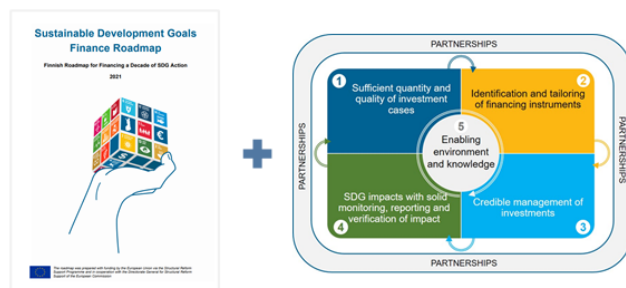
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<sup>105</sup> Among international case studies reviewed during this project a few examples of "ecosystem approaches" or approaches that aim to address full financing "value-chains" could be identified, and these have been presented also within the ecosystem analyses as well as more extensively in Annex IV (see in particular cases Climate Finance Lab as well as the DFCD).



manner and can serve as basis for further refining the toolkit and applying it also in other ecosystems (thematically and/or regionally) addressing SDG finance challenges

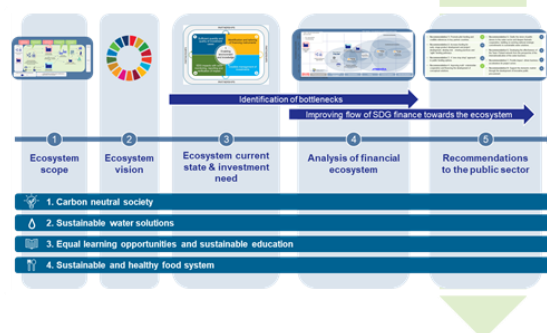
## 1 Understand the current state and create a shared vision at national level



The roadmap helps understand the status, create a strategic vision and a basis for commitment for joint national action.

The roadmap elements help structure the analysis, creates comparability with experiences by other countries and international peers, and lays the basis for systematic learning.

## 2 Engage stakeholders in key SDG thematic areas



### The work on pilot ecosystems:

- Allows **focus and building consensus** around prioritized SDG themes and strongholds.
- Provides **a transparent and participatory process** with key stakeholders to build engagement and commitment.
- Helps **deepen the analysis, identify the actions needed** to build investment pipelines, **address existing bottlenecks** in the existing finance ecosystems.
- Enables **the private sector** to get on-board to help unlock SDG aligned investments at scale.



Figure 28. The Finnish experience of transforming the finance system, suggest that a tool /toolkit for promoting SDG aligned finance should provide i) strategic and policy level guidance, which builds national commitment and a joint overall framework for key stakeholders, as well as ii) more concrete level of guidance on approaches, process, tools and best practices that can serve on a practical level in building investment cases, defining required (more tailored) finance instruments, in identifying credible management solutions as well as SDG impact assessment and reporting solutions.

Figure 28 visualizes the two key elements of the SDG finance approach and toolkit developed and tested in *Developing Finland's SDG Finance Ecosystem*. It highlights the combination of approaches and tools that need to be in place, when aiming for a systematic transformation and SDG alignment of finance. The work within pilot ecosystems allows identifying key bottlenecks as well as required solutions in more detail, develop required approaches and tools, build capacities financing solutions on a level that can help concretely boost concrete investments.

## 6.3 Next steps for Developing Finland's Sustainable Finance Ecosystem

By engaging from early on key stakeholders into the pilot ecosystem identification and development, and by conducting numerous bilateral discussions with relevant public finance agencies, commitment has been stepwise built to help ensure that stakeholders are ready to take forward the recommended actions. **To support this commitment and help responsible public sector funding organisations act on the recommendations, the project will during early 2022 focus on**

**Refining and communicating the recommendations** and facilitate information exchange and coordination between key partners.

This report summarizes the key activities and results achieved during Developing Finland's Sustainable Finance Ecosystem – project during March-December 2021). Extensive efforts have been provided by the ecosystem core groups, and numerous stakeholders have been engaged in ecosystem work, refining the analysis, participating in building capacity and sharing insights and in particular in carving recommendations for needed actions. The ultimate impact of this project should be visible in the coming months and years, i.e., through the amount of finance that measurably will be directed towards SDG aligned investments. For these reasons the national SDG finance workshops and final meetings of the pilot ecosystems have focused on ensuring that the home bases of each pilot ecosystem have taken ownership of the recommendations, and also, together with the ecosystem partners, have a joint understanding of key partners that need to be “on-board”.

Hence the project will assess options for improving collaboration and information sharing, and help responsible public sector stakeholders (including public funding organisations and their government ownership) identify concrete next steps of action and suitable solutions for enhanced coordination and communication

**Compiling and refining the main lessons learned from the pilot ecosystems**, with the view to help apply and tailor the recommended actions across ecosystems more broadly and help increase sustainable financing overall. The pilot ecosystem work has identified a number of recommendations and lessons learned, in particular from the Finnish finance ecosystems but also through international reviews and case study analyses. It is important to compile and refine these lessons learned to boost the existing finance ecosystems and help ensure that all relevant experiences, capacities and lessons learned are helping to scale up SDG finance more widely, in Finland but also with EU peers.<sup>106</sup>

Hence the project will compile, refine and communicate the main lessons learned, in order to help public sector accelerate the mobilization of SDG aligned finance, noting the increasing need for major mobilization of private finance during this decade.

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<sup>106</sup> This will be a particular focus of the project during its final phase, during the second quarter of 2022. Already during phase III of the project, lessons have been shared with Belgium with an on-going process of developing its SDG finance system, also with the support of DG Reform.

## ANNEX I Pilot ecosystem core groups

An integral part of the ecosystem pilot selection process in early 2021 was identifying a home base for each pilot, i.e., an implementation partner, body or organization of the public sector who takes ownership of and responsibility for the pilot ecosystem development. These implementation partners have been

- Ministry of Economic Affairs and Employment: pilot finance ecosystem for offshore wind power
- Finnish Water Forum: pilot finance ecosystem for climate smart water solutions
- Finnish National Agency for Education, represented by Oppiva Invest pilot finance ecosystem for vocational education and training)
- Ministry of Agriculture and Forestry: pilot finance ecosystem for sustainable protein

The members to the core groups (the taskforce members, varying from 10-15 across the pilot ecosystems) were selected with the objective to have good representation from key stakeholder groups, including public, private and NGOs, in order to be able to identify all key bottlenecks, ensure transparent and productive discussion, and identification of potential solutions. Other stakeholders not invited to core groups were regularly briefed of the progress and initial results presented at national workshops (see Annex II).

## ANNEX II Key stakeholder events and workshop summaries

The project has conducted extensive stakeholder consultations and arranged several workshops and bilateral meetings during 2021. This annex summarizes key stakeholder events and their main outcomes. All central findings and insight have been integrated into pilot ecosystem analysis and recommendations presented in the actual report.

Materials from the workshops have been shared with all invitees and workshop participants after the events.

### 18.6.2021 – Workshop Aligning public and private finance with the SDGs (summary notes)

#### Objective:

- Improve the knowledge and capabilities of public sector financing organisations for the deployment and mobilization of sustainable finance and the harmonisation of sustainable finance practices.

#### Outcome:

- Contribution to improved overall awareness and capacity for addressing SDG finance alignment in relevant public organisations.
- Collecting input for identification of development needs for more tailored and systematic capacity building and knowledge raising.

#### Program:

##### **Session I (in English)**

- 9:00 Objectives and background: Mikko Halonen, Gaia Consulting Oy
- 9:10 Hannes Huhtaniemi, Policy Officer, DG FISMA, European Commission
- 9:20 Milla Kouri, Ministry of Finance, Finland
- 9:30 Minna Leisvuori, European Investment Fund (EIF)
- 9:40 Panel discussion (moderated by Gaia, 20 min)

##### **Session II (in Finnish, suomeksi)**

- 10:00 Nina Männynmäki, Finanssivalvonta (Financial Supervisory Authority)  
Anne Rothovius, Työ- ja elinkeinoministeriö (The Ministry of Economic Affairs and Employment)  
Saara Mattero, Ilmastorahasto (The Finnish Climate Fund)  
Isa Maria Bergman, Motiva (Finnish state company in sustainable development)
- 10.30 Paneelikeskustelu + Q&A (Gaia moderoi, 25 min/ Panel discussion moderated by Gaia)
- 10.55 Tilaisuuden päätös (closing remarks)

### **Workshop participants (53)**

- Ministries: 20
- Financial sector
  - Public: 12
  - Private: 2
- Other private sector: 2
- NGOs 6
- Centre for Economic Development, Transport and the Environment: 4
- Cities and municipalities: 4

### **Panel I – Key questions and discussion**

- *EU taxonomy within the global context – where are the forerunners?*
- *What are the benefits for engaging early -on?*
- *What are the synergies to tap into – finance industry led initiatives, impact investing, SDG finance ecosystems ....?*
- + *Questions from the audience*

### **Panel I highlights**

- ✓ *Taxonomies are being developed also in other countries, e.g. China. EU can help other countries in developing their taxonomies.*
- ✓ *The scale of needed SDG finance is in trillions, not in billions or millions, which are currently discussed e.g. in the UNFCCC talks. Leveraging private money is key to reaching the trillions. UNFCCC decisions, SDGs and the EU taxonomy need to all be aligned with each other -> currently this is not the case. We have good language under the SDGs, and it is not yet transposed to the UNFCCC.*
- ✓ *As we try to be professional asset managers, it is key to define what is meant by SME financing and how it's connected to the high-level SDG targets. We don't finance the SMEs directly, so how should we report on reaching the targets? Finding a common language is key. Access to finance is important to enable the green transition to truly happen.*
- ✓ *When Article 8 Delegated Act comes, it will include guidance on how to calculate alignment in listed companies. Companies don't publish alignment information yet, as there are not yet formal rules on this. Small companies have not yet "woken up" to the same extent as bigger companies, but all companies should know about the taxonomy.*

### **Panel II – Key questions and discussion**

- *What kinds of expertise and capacity needed within public sector?*
- *What themes/areas of sustainable finance should be addressed jointly, what a priori per organisation/actor?*

- *What kinds of co-benefits and value-add can improved understanding and capacity in sustainable finance have for various organisations*  
+ Questions from the audience

### **Panel II highlights**

- ✓ *The public sector/administration is changing slowly, and hiring new people is important to get up-to-date skills also on sustainable finance. The prime minister's office in Finland has among other purchased corporate responsibility training from Aalto University for civil servants.*
- ✓ *The criteria for the Finnish Climate Fund were given by the owner (with the Ministry of Economic Affairs and Employment being in charge of ownership steering) when Vake became the Climate Fund. In other words, the criteria were given to us and now they have been made more concrete and we have benchmarked selected peers, including the Nordic countries. The criteria are in line with the EU taxonomy. Leverage is important, public money alone will not solve the SDG challenges. There are many different taxonomies, but their application is still in its infancy. The Do no significant harm (DNSH) principle is important for the Climate Fund, meaning we cannot cause harm to the environment while solving the climate crisis.*
- ✓ *In Finland we have a massive € 47 billion potential in public procurement, which is an opportunity to save costs and reap climate and sustainability benefits. The greatest efficiencies have been identified, and the requirements of the taxonomy have also been identified. Now we are thinking about how the taxonomy could better support the public sector when planning procurement and investment. The stricter the criteria, it can be challenging for the public purchaser, as it is important that sustainable solutions are available at the time when the need for procurement exists.*

### **Workshop summary notes:**

- The sustainable finance taxonomy is broadly welcomed by Finnish public sector stakeholders; however, considerable efforts are required for successful uptake.
- Overall, an understanding of the interlinkages (potential synergies and trade-offs) within and between Paris Alignment, EU taxonomy alignment and SDG alignment in finance, and the global efforts (several taxonomies being internationally developed, and capacities & readiness internationally varying considerably, too)
- A number of public sector organizations have taken steps to analyze their taxonomy alignment, mainstream DNSH but overall the capacity remains scattered and limited in Finland with discussion accelerating 2021
- A willingness and readiness for joint learning, joint efforts coordinated nationally and supported as much as possible by joint EU initiatives, tools (such as the EU Taxonomy Compass <https://ec.europa.eu/sustainable-finance-taxonomy/>). A need to train

and develop skills, improve education for taxonomy expertise is commonly recognized.

- The discussion in Finland has mainly focused on the technical challenges and potential bottlenecks in putting the taxonomy into action, more so than on the drivers of sustainable finance and the impacts that are being targeted, i.e. upside of SDG impacts remain still in the background
- For this reason it would be good to highlight and share success stories, share experiences of how taxonomy alignment can work and what are the benefits (for environment, climate, biodiversity, for competitiveness, for more sustainable natural resource management, for cost savings, for risk reduction and management, for development impacts....)
- In conclusion it was highlighted that in order to better mainstream taxonomy there is a need for
  - Sharing information on the taxonomy (as done in this workshop)
    - Get experiences on using the taxonomy and how much different financial products, financial institutions and companies are taxonomy aligned?
    - Which criteria work and which not in practice?
    - Have more private (and public) project and pilots on using the taxonomy in order to learn in practice
  - Building systematically capacity to get access to the “upside” of taxonomy implementation. The taxonomy is helping us in developing a common language for public and private sector stakeholders of what is sustainable finance.

## **24.9.2021 – Workshop Aligning public and private finance with the SDGs (summary notes)**

### **Objective:**

The objective of the workshop was to build further capacity and commitment to SDG aligned finance ecosystems and boost concrete work within four pilot ecosystems. The workshop continued the project approach to integrate capacity building to all workshop meetings, with possibility for all stakeholders to actively participate through virtual platforms, contributing to draft materials, commenting as well as posing questions and suggesting focus areas to address during the project.



### **Organisation of workshop and structure:**

- The first session presents project objectives and shares initial project insights. The Finnish Roadmap for Financing a Decade of SDG Action is launched and shortly introduced. Also international case studies and lessons learned will be shared.
- The second session aims to dwell into more concrete work through four breakout sessions, allowing to present and validate initial recommendations for public sector stakeholders.
- The third session pulls together, compares key findings across four pilots and highlights required further amendments. The third session is concluded by five stakeholder perspectives, integral for successful SDG finance ecosystems.

During second session, groups were chaired by pilot ecosystem home bases/core group leaders, and facilitated by Gaia experts. The workshop material was made available to all workshop participants and also through project website/Howspace after the event, including follow-up questions and possibility to further contribute. The workshop was executed in Finnish with simultaneous translation provided in English.

### **Workshop participants (128):**

- Ministries: 27
- Financial sector: 22
- Other private sector: 27
- NGOs (non-governmental organization) 23
- Centre for Economic Development, Transport and the Environment: 4
- Cities and municipalities: 3
- Academia and research institutes: 22

### **Programme**

#### **Developing Finland's Sustainable Finance Ecosystems**

*From Roadmap to SDG finance action - National SDG finance workshop, Friday 24.9.2021 (9.00–11.55)*

#### **I. Opening session (plenary, 60 min)**

- |           |  |
|-----------|--|
| 9.00-9.10 | <b>Opening words</b> , Sari Tasa, Ministry of Economic Affairs and Employment  |
| 9.10-9.25 | <b>Developing Finland's Sustainable Finance Ecosystems</b> , Mikko Halonen, Gaia <ul style="list-style-type: none"><li>▪ Project insights and launch the Finnish SDG Finance Roadmap 2021</li></ul>  |
| 9.25-9.55 | <b>International case studies and lessons learned</b> (presentations in English) <ul style="list-style-type: none"><li>▪ International case studies, Jeroen van der Laan, Trinomics / Mikko Halonen, Gaia</li><li>▪ Lessons learned from “Climate Investor One and Two and...”, Andrew Johnstone Climate Fund Managers</li></ul> |

#### **II. Four pilot ecosystems to mobilise SDG finance (60 min, with four breakout groups)**

- **Carbon neutral society (case offshore wind power, with focus in Finland);**
  - Coordinated by Ministry of Economic Affairs and Employment Jyrki Alkio (facilitated by Mirka Lummaa, Gaia)
- **Sustainable and healthy food systems (case sustainable protein production, with focus in Finland);**
  - Coordinated by Ministry of Agriculture and Forestry, Hanna Mattila (facilitated by Anna Laine, Gaia)
- **Sustainable water solutions (case climate smart water solutions, with focus on developing and emerging markets);**
  - Coordinated by Finnish Water Forum, Topi Helle (facilitated by Mikko Halonen, Gaia)
- **Equal learning opportunities and sustainable education (case vocational education and training, with focus on developing and emerging markets).**
  - Coordinated by Finnish National Agency for Education, represented by Titta Mantila, Oppiva Invest (facilitated by Miikka Simanainen, Gaia)

### **III. Making SDG finance happen (plenary, 55 min)**

11.05-11.35	<b>Sharing key insights from breakout sessions</b> – summaries from coordinators & facilitators	+	questions	from	audience
11.35-11.50	<b>Five perspectives into SDG finance – making it happen</b> (2 min pitch/perspective)				
-	SDG impacts (Finnfund/Juho Uusihakala), ownership (Prime Minister's Office/Esko Pyykkönen), profitability (FIM/Jussi Nykänen), capacity and knowledge (Hanken School of Economics, Hanna Silvola), business opportunity (Solar Water Solutions/Antti Pohjola)				
11.50-11.55	<b>Closing words and next steps, Sari Tasa</b> , Ministry of Economic Affairs and Empl.				

### **Summary notes from workshop – key findings and conclusions:**

Following introductory words by national project coordinator, project key elements and initial findings were presented. The SDG roadmap was launched, highlighting the main ingredients of the Finnish roadmap, and its main goals within the five core elements.

Selected international lessons learned and case studies were presented, highlighting similar processes internationally, and in particular noting linkages with the four pilot ecosystems in Finland – how these pilots can make use of lessons learned and innovative initiatives in other countries.

An international keynote presentation by Mr Andrew Johnstone focused on the role of public sector in mobilising SDG aligned investments in emerging and developing countries in particular. The presentation noted that while there are important lessons that can be shared, the importance to learn by doing should not be underestimated, highlighting the importance to move ahead, noting the urgency of action, if we aim to reach the SDGs during this decade.

The second session was organized in four pilot ecosystems, facilitated by the public sector “home bases” (also acting as chairs of the breakout sessions) with main findings feeding directly into pilot ecosystem analysis (presented in this report, chapter 2-5, with joint conclusions and recommendations in chapter 6).

The third session started with summaries from group works, provided by the chairs. The initial recommendations within each pilot received broad support, with the discussions within

four groups helping to prioritise as well as further refine some of the recommendations. The summaries of the chairs highlighted that some of the required changes and amendments to the Finnish finance ecosystems are common – in particular related to i) the need to improve the level and tailoring of finance for proof of concept phases as well as for establishing references in partner countries, ii) the need to improve the collaboration and level of partnerships between Finnish public sector finance agencies. In addition, a number of pilot specific recommendations could be identified, taking e.g. note of the types and sizes of businesses working on vocational education internationally vis a vis offshore wind power or vis a vis agricultural production in Finland. This indicates that common and cost-efficient measures to improve most of the finance ecosystems could be identified, while the tailoring of measures could be narrowed down on specific bottlenecks in specific areas of specific pilot ecosystems.

### **Concluding remarks:**

The workshop participants were encouraged to make use of the Finnish roadmap, noting its relevance for multiple national climate and SDG related strategies and commitments during this decade.

Also the participants were encouraged to continue contributing through the virtual platform, and/or being directly in contact with the project team, and also suggest any priorities to be addressed during the remaining project period 2021- 2022. The participants were invited to highlight any SDG screening frameworks and tools that could be of assistance to them in accelerating SDG aligned project identification and pipeline development, finance instrument development, monitoring and reporting of SDG impacts as well as disclosure of SDG impacts of investments in the future.

## ANNEX III Complementary stakeholder consultations

In line with the project approach, active stakeholder consultations have been integral for successful implementation of the project. However, noting the limitations imposed by COVID19, and the need to engage as many as possible relevant stakeholders, Gaia and its partners have conducted a considerable number additional, complementary stakeholder interviews and consultations. We have considered these interactions beneficial for

- ensuring access to lessons learned by other national and international stakeholders,
- building the capacity of relevant Finnish, in particular public sector funding organizations, in cases not able to participate in the all the pilot ecosystems meetings and /or workshops, and/or not able to get direct (face-to-face) sparring and feedback during those sessions
- building stepwise the interaction and commitment of key stakeholders to the recommendations presented in the Roadmap, as well as the recommendations provided for the four pilot ecosystems (presented in this report).
- ensuring that all tasks of the assignment (in line with the ToR) are accomplished

In total some 130 national (some 90% of interviewees) and international stakeholders (some 10% of stakeholders) have been consulted and/or sparred during the past months. Some of them have been members of the ecosystem core groups, but additional discussions have been also conducted with them. The views of these stakeholders have been taken into account in producing this report, but no quotes nor personal opinions of these consultations have been included. The consultant bears the full responsibility of any mistakes or misinterpretations included in the report.

## Annex IV International case studies

This annex highlights selected international experiences in mobilising SDG aligned finance, linking to the four pilot ecosystems advanced in Finland during this project. The case descriptions include a i) concise context summary, ii) highlights from recent developments as well as iii) an analysis of mutual learning points, making use of the elements from the Finnish Roadmap. The four case studies included in this annex cover:

- *Case study (ecosystem): Dutch Fund for Climate & Development (DFCD)*
- *Case study [instrument]: Water Financing Facility (WFF)*
- *Case study [instrument]: Offshore wind farms in the Dutch North Sea*
- *Case study [ecosystem]: Global Innovation Lab for Climate Finance (The Lab)*

Two of the case studies (DCFC and the Lab) provide interesting sources of comparison from a broader “ecosystem perspective”, i.e. their approaches cover several of the elements included also in the Finnish roadmap. Two of the case studies (WFF and Offshore wind farms in the Dutch North Sea) provide a more focused source of comparison, in particular related to types of instruments and enabling environments that could be decisive in making mobilisation of SDG aligned finance work.

### 1. Case study - Dutch Fund for Climate & Development (DFCD)

#### Context:

The DFCD ([www.thedfcd.com](http://www.thedfcd.com)) was set up in 2019 by FMO, SNV Netherlands Development Organization, World Wide Fund for Nature (WWF) and Climate Fund Managers. The DFCD **connects the project development expertise** of SNV and WWF to the **mobilizing and investment power** of FMO and Climate Fund Managers, after a **competitive tendering procedure** for grant funding (160 mln EUR) by the Dutch government. The DFCD serves as an additional instrument for the Dutch government's efforts in contributing to the Paris Agreement and the SDGs. The fund is rather unique in its kind by bringing development finance institutions, investment managers, NGOs and civil society organisations together in **one powerhouse for addressing SDG needs** in developing countries.

The **DFCD's investment strategy** focusses on **high-impact finance and projects** around climate adaptation and resilience in particular (e.g. climate-resilient water systems, water management and freshwater ecosystems, forestry, climate-smart agriculture, and restoration of ecosystems) via three separate but operationally linked facilities based on the strengths of each of the consortium partners. A **'landscape' strategy for deal origination and execution** has been adopted in order to actively source and **develop private sector investment opportunities** in-and-around, as well as **downstream opportunities** from own investment activities, and create a value-chain between the different facilities:

- ❖ **Origination Facility [Pillar 1]:** managed by WWF/SNV, develops project identification and (pre-)feasibility activities across the DFCD impact areas and thematic sub-

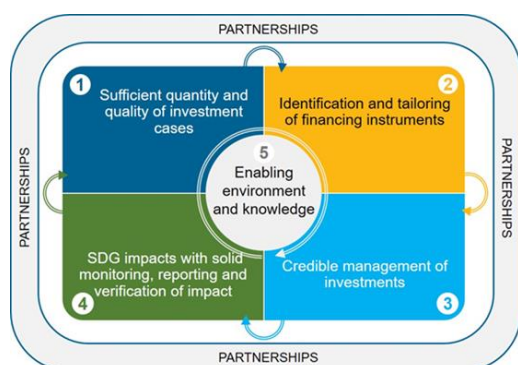
sector focus. Their partner network on the ground in developing countries and among peers within the NGO and civil society community is a strong selling.

- ❖ **Land Use Facility [Pillar 2]**, managed by FMO, targets investments in sectors relating to agroforestry, sustainable land use and climate resilient food production that have **graduated from the Origination Facility**. Next to the earmarked funding of this facility under the DFCD, FMO offers their financial instrumentation to provide growth finance via FMO's other instruments and networks with other development finance institutions.
- ❖ **Water Facility [Pillar 3]**, managed by CFM, contributes and invests in the development, construction and operational phases of water and sanitation infrastructure projects **graduating from the Origination Facility**. CFM utilizes here in the roll-out the proven fund structure of Climate Investor One and will target a Development Fund, a Construction Equity Fund and a Refinancing Fund (known as **Climate Investor Two**).

#### **Key highlights to date (2019-2021):**

- DFCD increased its pipeline of climate-relevant business project and had a sizeable number of projects approved by the relevant Investment Committees.
  - DFCD Land Use Facility: FMO contracted **2 transactions** in 2020: a \$5 million mezzanine product to help with an expansion of Miro Forestry in Ghana and Sierra Leone and a \$7.5 million equity investment in Komaza Plantation Forestry to further support small-scale farmers in Kenya.
  - DFCD Water Facility: **4 transactions** were contracted with development capital contributions. These include a seaweed aquaculture project in Namibia, a municipal waste-to-energy project in Thailand, a solar water solution project in Kenya and a specialised container concept that could reduce the greenhouse gasses of the shipping industry substantially.
  - DFCD Origination Facility: **4 transactions** were contracted that will receive grants and technical assistance support. WWF contracted a community carbon project with New Forest Company in Uganda. SNV contracted a project to restore peatlands in Indonesia with Forest Carbon, a seaweed energy project in Indonesia with Sea Tech energy, and a solar water desalination scheme in Kenya, Solar Water Solutions, also supported by the DFCD Water Facility.
- The **Scalable Climate Solutions Challenge** has been launched by the DFCD in 2021, in order to organise an **extra “push”** for receiving/developing potentially bankable climate projects in **Uganda, Kenya and Bangladesh**, in order to scale up efforts. The benefits of participating in the Challenge is that the selected project developers have a chance to present their project at COP-26 and are eligible to receive an **additional Capacity Development Contribution** from the Origination Facility.

## Reflections and lessons learned from the perspective of the Finnish finance ecosystems



The insights and lessons learned are linked here to the five key elements that have been included in the Finnish roadmap and that have served in ecosystem pilot development and analysis. This case provides interesting “ecosystem”-wide insights.

For full description of the elements see [\*Finnish Roadmap for Financing a Decade of SDG Action 2021\*](#).

The **landscape approach** of the DFCD by supporting potentially interesting bankable climate projects, from project development to deal origination through financial close and contracting, has proven itself by **2 projects being contracted** by the Water and Land Use Facilities after the support they received under the Origination Facility. Although it's too early days to talk about the quantity of bankable investment cases produced by the DFCD, it definitely **supported to improve the quality of investment cases** in order to get them **bankable against the DFCD investment criteria**

- *insights and lessons learned on roadmap element 1*

With DFCD being “hosted” at FMO allows the offering of **tailored financial structures** for DFCD-funded projects, as following the DFCD-contract with the Dutch government, FMO is allowed to provide loans, guarantees and equity capital from FMO's own resources to be blended with DFCD finance

- *insights and lessons learned on roadmap element 2*

FMO and CFM are pioneers among DFIs when it comes to SDG-related investment projects in developing countries, with a **proven track record** in the field. The combination of bringing renowned organisations along the value chain of deal origination until financial close into one **powerhouse**, makes the DFCD concept **very credible** in terms of investment management of bankable climate projects.

- *insights and lessons learned on roadmap element 3*

DFCD's impacts are **monitored** by FMO's established SDG impact framework

- *insights and lessons learned on roadmap element 4*



## 2. Case study - Water Financing Facility (WFF)

### Context:

The **Water Finance Facility (WFF)** (<https://waterfinancefacility.com/>) is managed by Cardano Development and is considered a **best practice and “champion”** in the water sector related innovative investment solutions being developed and tailored under the Global Innovation Lab (“The Lab”). The WFF was conceptualized by the Dutch Ministry of Foreign Affairs, in collaboration with CSC Strategy & Finance and Stafford Capital Partners and endorsed as part of the 2015-2016 Lab cycle.

The WFF mobilises **large-scale domestic private investment** from international and domestic institutional investors, such as pension funds, insurance companies and other qualified investors, by **issuing local currency bonds** in the capital market in support of their own country's **national priority climate actions on water and sanitation service delivery**. It seeks to coordinate this finance with **public funding and international impact investment** to help bridge the investment, infrastructure, and sustainability gaps countries are facing. The aim is to develop **several country level water financing facilities**, which can issue bond in their capital markets to provide **long-term loans** to public or private water utilities that have **little or no access to commercial finance** or that have access at unfavorable terms, such as **short tenors**. Through the pooling of projects of credit worthy water and sanitation companies, the **bonds will have lower risk**<sup>107</sup>. This risk can be further reduced, if reserve funds, guarantees, soft loans or grants for blended finance can be incorporated into the capital market structures.

The availability of financing and safe management of water and sanitation for all (SDG 6) cannot be achieved by public sector funding and management alone. WFF, as a non-bank, **public benefit financial company**, can make a difference by using its capital to develop local water financing facilities that can bring private, large-scale and long-term capital market financing into the water sector. At the same time, WFF will **enhance local capital market development** by providing alternative, credit worthy, long term investments opportunities for the local pension funds and other investors of the domestic capital market. WFF's target is to **help local water utilities develop financeable projects** and obtain access to financing and thus provide approximately 20 million people with sustainable access to safe water and adequate sanitation services.

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<sup>107</sup> A **pooled bond transaction** involves aggregating or bundling loans from **several credit worthy water and sanitation companies** and issuing a single bond to the capital market. The **local pooled transaction** is appropriately credit enhanced with **de-risking instruments** (e.g. guarantees) to become a viable investment proposition for the local institutional investor community. Pooling a number of loans into a single transaction for financing has three advantages over single issuance vehicles: (1) the common financing structure spreads the **transaction costs** among all borrowers, creating an **economy of scale**, (2) larger capital market financings **attract more investors**, and (3) pools **diversify risk and are less costly** to credit enhance.

### Design of the WFF:

A **World Water Financing Facility (WWFF)** has been established as a **limited liability company** that seed-funds and facilitates the creation of national-level facilities and provides financial engineering, transaction advice, and financial management support. The national-level facilities would be established in developing countries and would provide **long-term, lower cost loans to public or private water utilities** that have little or no access to commercial finance or at poor terms. The loans would be backed by the utility but linked with **specific water infrastructure investments**, appropriately screened and designed to enhance the adaptive capacity of the utility and sector against identified climate vulnerabilities. The **National Water Financing Facility (NWFF)** would then leverage its **blended finance capital structure** to issue local currency, investment-grade bonds to domestic institutional investors. Incomes generated by (domestic) water utilities would be ring-fenced to provide **additional creditworthiness** beyond the strength of utilities own balance sheet.

Some specific **innovative aspects** differentiate the WFF concept from existing initiatives, introducing innovative applications that expand the set of financing options for water projects in developing countries:

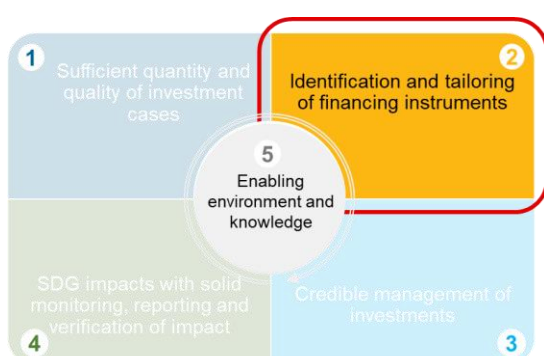
- **WFF is focused on deal-structuring and increasing the supply of commercial finance.** Many “*project preparation facilities*” (PPFs) also focus on policy dialogues and the enabling environment. The WFF develops and finances water companies with a specific focus on **projects’ bankability**. In this context, it provides **corporate funding at commercial-like rates**, which encourages the local utilities to perform better than they would under concessional finance terms;
- **WFF works on national level entities.** Geographically, most of the initiatives analyzed are mandated to operate across regions. The WFF would develop multiple national facilities that focus on single countries, thus ensuring a better understanding of the local market needs;
- **WFF specifically focuses on the water sector and mitigates sector-specific risks.** Several facilities providing risk mitigation and finance solutions in developing countries are focused on infrastructure. The WFF has a specific mandate on the water sector. Existing support mechanisms for infrastructure such as guarantees more often focus on energy sector due to the availability of more bankable projects brought about by greater clarity on revenue streams associated.

### Key highlights to date:

- A first NWFF has been initiated in **Kenya** in 2017 with support of the Netherland Embassy in Nairobi, the Kenyan National Treasury, the Ministry of Water and Irrigation, the Water Sector Trust Fund, USAID, SIDA and SNV. The Kenyan NWFF has been incorporated with a **Kenyan Board and senior staff members** and the first issuance of bonds was expected for the end of 2019 (tbc), with the expectation that the Kenya NWFF to be able to plan similar bond issuances each year going forward.
  - **To date** (Sept 2021), the Kenyan NWFF hasn’t issued a first bond yet, due to:
    - ✓ **COVID-19** has played a role, but other factors had more impact;

- ✓ The initiative needed a **financial contribution** from the Kenyan government;
- ✓ The bond was going to finance projects in the water sector and **finding viable projects is difficult**;
- ✓ Water utilities needed to be creditworthy and to determine this some **proper due diligence** was needed, which was very time-consuming.
- The global WFF is targeting **other developing countries** to be operationalized, possibly including western Africa (Franco-phone region), South Africa, Peru, Indonesia, Vietnam.

### Reflections and lessons learned from the perspective of the Finnish finance ecosystems



This case provides interesting insights in particular related to instruments

For full description of the elements see [\*Finnish Roadmap for Financing a Decade of SDG Action 2021\*](#).

The **WFF concept** supports various aspects and activities relevant within the context of the Finnish SDG Finance Roadmap, and the climate smart water solutions pilot in particular:

- On the one hand, the WFF supports **private sector development** with the establishment of **special purpose vehicles (SPVs)** and access to finance of (international/domestic) institutional investors via **pooled bonds transactions**, which themselves allow **de-risking instruments** to be part of the financial deal structuring for the national water utilities
- The national water facilities, with access to finance from international markets, are then able to invest in climate smart water solutions in their **own local currency**, which (potentially) could **catalyse private sector development** further – of climate smart water solutions – in its turn as well as a (additional) rebound effect.

### 3. Case study - Offshore wind farms in the Dutch North Sea

#### Context:

Aside of the international (Paris Agreement) and European (EU Green Deal) frameworks for ambitious climate action, targets and policies, a **National Climate Agreement (“Klimaatpakkoord”)** has been negotiated and agreed among public sector authorities, sector and industry representatives, civil society organisations and NGOs, and has been put into legislation in 2019. The National Climate Agreement puts GHG emission reduction targets into **binding sector-level obligations and legislation**. Among the targets is a **70% RES electricity target** by 2030 (around 84 TWh). The main channels for delivering this commitment is through **(large-scale) offshore wind farms in the North Sea area (49 TWh)**, onshore wind (with larger onshore wind farms in the Northern part of the country), as well as solar power (i.e. larger solar fields). The Ministry of Economic Affairs and Climate (“Ministerie van Economische Zaken en Klimaat (EZK)”) is responsible for the implementation and monitoring of the National Climate Agreement, in collaboration with the Social Economic Council (“Sociaal-Economische Raad (SER)”). Jointly, they are overseeing and governing the **regulatory framework** for reaching the emission reduction targets as set by the National Climate Agreement, which includes the **Ministerial Order for Offshore Wind Energy 2015**.

To date (2021), the Netherlands has **seven (7) operational and active offshore wind farms** in the Dutch North Sea, with around **2,5 GW of installed capacity**<sup>108</sup>. Another three designated areas for offshore wind (i.e. Hollandse Kust (Zuid) and Hollandse Kust (Noord)) have been permitted and wind farms are under construction (another 2 GW) at the moment. For another three (3) designated areas, a ministerial permitting (tendering) procedure will be starting in 2022 and 2023, for building additional wind farms with the intention to have about 11 GW of installed capacity by 2030.

In order to support the development of renewable energy technologies and industrial innovation, project promoters can apply for subsidy-funding under the **Stimulation of sustainable energy production and climate transition** (“Stimuleren Duurzame Energie en Klimaattransitie – SDE++”), mostly to support the exploitation period, at the **Netherlands Enterprise Agency (RVO)**. Subsidy can be requested for subsidizing the “gap” between cost price for the technology and the market value of the product (i.e. RES electricity). Once approved, the subsidy is provided for 12-15 years and is “corrected” for on an annual basis of “key performance indicators”.

While the subsidy scheme applies for various RES technologies, a separate scheme, under the auspice of the SDE++ applies for the development and permitting of offshore wind energy (**Offshore Wind Energy SDE++**). RVO executes the offshore wind energy subsidy and permit tenders on behalf of EZK. Subsidies and permits for the development of the wind

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<sup>108</sup> <https://www.rvo.nl/onderwerpen/duurzaam-ondernemen/duurzame-energie-opwekken/windenergie-op-zee/windparken-op-de-noordzee>

farms are awarded to the bid, following a competitive tendering procedure, that meets all criteria.

### Key highlights to date:

- The wind farm (Hollandse Kust (Zuid) III and IV) is currently under construction by Chinnook/Vattenfall after the closure of the permit award procedure in 2018. This is rather special, as it will be the **first subsidy-free wind farm in Europe**. The costs of offshore wind energy have dropped dramatically in the last few years due to rapid developments in the market:
  - Vattenfall has been able to complete the project without the financial help of the government as the government **guaranteed the licence and network connections** in the tendering procedure. This means that the risks involved, and thus the inherent costs, have dropped dramatically.
  - The Dutch government is, next to setting the regulatory framework, **“in charge” and bears the costs for the necessary enabling environment**, such as (technical) feasibility studies, due diligence research, legal procedure to assign designated areas for offshore wind farms in the Dutch North Sea, as well as the interconnector infrastructure from the offshore wind farm to the mainland (by law TenneT (Dutch TSO) is obliged to connect large RES projects to the electricity grid).
- Last year (2020), the **third subsidy-free wind farm** (Hollandse Kust (Noord)) was awarded to the CrossWind consortium (Shell/Eneco) and received the permit for exploitation.

### Reflections and lessons learned from the perspective of the Finnish finance ecosystems

This case provides interesting insights related to instruments as well as enabling environments that have been key in mobilising offshore wind power investments in the Netherlands.



For full description of the elements see [\*Finnish Roadmap for Financing a Decade of SDG Action 2021\*](#).

## 4. Case study: Global Innovation Lab for Climate Finance (The Lab)

### Context:

The Global Innovation Lab for Climate Finance (<https://www.climatefinancelab.org/>) (or “The Lab”), managed and hosted by Climate Policy Initiative (CPI), was developed in 2014 by the United Kingdom, United States and Germany in partnership with major development finance institutions, key private sector actors, and several climate finance donor governments – Denmark, France, Japan, the Netherlands and Norway. The platform serves as a “**Lab**” to **co-create new innovative approaches and instruments for developing bankable SDG investment cases** in developing countries, and hence could be considered as an financial ecosystem on its own. The Lab executes and implements five programmes:

- The **Global Lab (1)** (2014) was created to identify and develop innovative instruments that could drive private finance for climate mitigation and adaptation in developing countries, but has broadened up scope to other SDG impact areas. The 2021 cycle of the Global Lab on climate action and green recovery in critical sectors in developing countries, such as **sustainable food systems and value chains** and sustainable energy access.
- In 2015 the **India chapter (2)** was launched in coordination with the Indian, US, and UK governments.
- The **Brazil program (3)** was launched in 2016 under the auspices of the Brazil-U.S. Climate Change Working Group, led by the Brazilian Ministry of Foreign Affairs and the U.S. Department of State.
- In 2020, the Lab created the **Southern African programme (4)**, tailored to suit the region’s market for climate finance instruments.
- After the wealth of experience gained by the Lab, this year (2021) a **replication programme (5) for increasing impact of existing Lab instruments** has been launched with the aim to scale up SDG-finance solutions.

### Key highlights to date (2014-2020):

To date (2021), the Lab has developed and launched 49 innovative financial solutions which **mobilised over USD 2,4 billion (USD 800 million of private finance)**. The Lab contains more than **70 public and private Lab Member institutions**, and has more than **300 supporting experts** working on innovative instruments being developed under the auspice of the Lab.

Last year (2020), the Lab Secretariat published a discussion paper on lessons learned, best practices and “**champion**” **examples** from operating The Lab<sup>109</sup>. The four **key success factors** for driving the success and impact of The Lab are:

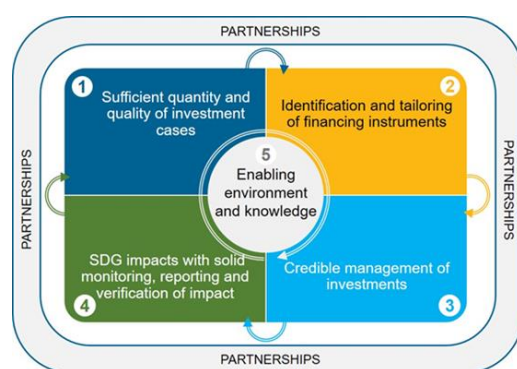
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<sup>109</sup><https://www.climatepolicyinitiative.org/wp-content/uploads/2020/11/Scaling-Innovative-CF-Instruments-Nov-2020.pdf>



- 1) **Establishing a track record**, defined as the instrument meeting its milestones in fundraising and on-the-ground impact. In practice, what milestones an instrument must demonstrate varies by the type of instrument. However, all instruments must define **what success means upfront**, and demonstrate success in raising investment and in deploying that investment on the ground. They must also establish iterative processes early on in their development, to understand and improve their progress.
- 2) **Building economies of scale**, defined as implementing a viable strategy for continuously increasing “**impact profit**” (impact per dollar invested). To scale, instruments must increase their impact at lower cost. Some achieve this through diversification, others by standardizing their processes and making them available to additional implementers, and others by clarifying an instrument’s essential elements so it can be more easily tailored by others to their own contexts.
- 3) **Putting together a robust team and governance structure**, defined as 1) a team having experience in the sector and in **working collaboratively**; 2) champions who will stay with the project **long-term**; and 3) organizational, governance, and incentive structures that **follow peer best practices**.
- 4) **Identifying the right long-term partners**, defined as having in place strategic partners for pipeline, fundraising, and marketing. The case studies in particular identified the importance of having long term relationships with funders, and channel partners to generate pipeline at low transaction costs.

### Reflections and lessons learned from the perspective of the Finnish finance ecosystems



The insights and lessons learned from this case are linked to all five key elements that have been included in the Finnish roadmap and that have served in ecosystem pilot development and analysis. This case provides interesting “ecosystem”-wide insights.

For full description of the elements see [\*Finnish Roadmap for Financing a Decade of SDG Action 2021\*](#).

The **co-creation approach** of the Lab, serving as an exchange platform for Lab members, has proven itself to be very successful given i) the large number of innovative sustainable investment solutions delivering **bankable projects** since the establishment of the Lab (backed by 1 billion USD realised mobilisation) and ii) the selection process for identifying the **best-in-class “champion” conceptual solutions**, and the **co-development work** of the applicants together with the Lab Secretariat, in order to **improve the quality of the innovative sustainable investment concepts**. In order to be selected for the Lab process, the Lab idea needs to fulfil the following criteria:

- o **Actionable:** Lab idea needs to identify (1) the type of entity/entities that could complement it, (2) the **pathway towards implementation**, including timeframe,



activities, and key milestones, and (3) possible **challenges to implementation** and related management strategies;

- **Innovative:** Lab idea needs to demonstrate the ability to address, directly or indirectly, **barriers to private finance** that (1) have not yet been addressed or (2) that will be addressed **more effectively** compared to other instruments in the market;
  - **Catalytic:** Lab idea needs to demonstrate potential to (1) **mobilize private capital** within a sizeable market, (2) be **scaled up or replicated** in other contexts and (3) achieve socioeconomic, development and environmental impacts.
  - **Financially Sustainable:** Lab idea needs to identify (1) a strategy to **phase out public financial support**, thereby achieving market viability and (2) **possible challenges** to achieving its intended objectives and related management strategies.
    - *insights and lessons learned on roadmap element 1*
- Given the **innovative nature** of The Lab's operations and ideas, the Lab's instruments are (still) in early stage of development. However, some innovative instruments that originate from the Lab are **starting to scale up and mobilize private sector funding**, such as **Climate Investor One**. During the co-creation work during the Lab process, **financial concepts and structures are being tailored** by the Lab Secretariat and Lab idea applicant, in consultation with Lab members (from public and private sector institutions) which provides, among other, the financial sector perspective (and risk appetite) for the instrument being developed by the Lab
    - *insights and lessons learned on roadmap element 2*
- Various Lab Members, such as most Multilateral Development Banks (MDBs), FMO and HSBC, are **AAA-rated financial institutions** and **pioneers** when it comes to SDG-related investment projects in developing countries, with a **proven track record** in the field. The combination of bringing Lab ideas (and their applicants) and such renowned financial institutions together in "one room", makes the **management of bankable investment projects created under the auspice of the Lab very credible**
    - *insights and lessons learned on roadmap element 3*
- The Lab concept creates a **strong enabling environment** for Lab ideas, in terms of co-creation of innovation sustainable investment solutions, as well as in terms of **sharing valuable knowledge** (internal and external) among Lab Members (70+ organisations, and the network is growing) and the wider sustainable finance community
    - *insights and lessons learned on roadmap element 5*

## ANNEX V “Global Europe’ (NDICI)

Also called ‘Global Europe’, the Neighbourhood, Development and International Cooperation Instrument (NDICI) is the main instrument for EU cooperation and development with partner countries in the 2021-2027 period.

### History of the instrument

There was a need for consolidation of EU activities in the previous Multiannual Financial Framework (MFF), as there were multiple and overlapping instruments under the Global Europe heading. These instruments are now streamlined under the NDICI and are subject to a common set of rules (see Box 7 below).<sup>110</sup>

*Box 7. Previous instruments now grouped under the NDICI. Source: European Commission (2018) <sup>111</sup>.*

The NDICI – Global Europe streamlines instruments from the previous MFF that were under the Global Europe Heading, most of which expired on 31 December of 2020. These had varied purposes, including:

- poverty reduction and sustainable development (Regulation (EU) 233/2014 establishing the Development Cooperation Instrument),
- promoting the Union's strategic interests (Regulation 234/2014 establishing the Partnership Instrument),
- assistance for the Union's neighbourhood (Regulation (EU) 232/2014 establishing the European Neighbourhood Instrument),
- the protection of human rights (Regulation (EU) 235/2014 establishing the European Instrument for Democracy and Human Rights worldwide),
- crisis response, conflict prevention and peace-building activities in partner countries (Regulation 230/2014 establishing the Instrument contributing to Stability and Peace),
- support of small and medium-sized enterprises in targeted third countries and the development of social and economic infrastructure and support of projects related to climate change (Decision (EU) 2018/412 amending Decision No 466/2014/EU on the external lending mandate),
- a guarantee fund for external action (Regulation (EC/EURATOM) 480/2009), and a European Fund for Sustainable Development, its Guarantee and its Guarantee Fund (Regulation (EU) 2017/1601).

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<sup>110</sup> REGULATION (EU) 2021/947 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 June 2021 establishing the Neighbourhood, Development and International Cooperation Instrument – Global Europe, amending and repealing Decision No 466/2014/EU and repealing Regulation (EU) 2017/1601 and Council Regulation (EC, Euratom) No 480/2009. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0947&from=EN>

<sup>111</sup> COM(2018) 460 final Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Neighbourhood, Development and International Cooperation Instrument. Available at: [https://eur-lex.europa.eu/resource.html?uri=cellar:d2c24540-6fb9-11e8-9483-01aa75ed71a1.0002.02/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:d2c24540-6fb9-11e8-9483-01aa75ed71a1.0002.02/DOC_1&format=PDF)

As a result, the NDICI now covers all resources under the management of DG INTPA<sup>112</sup> and the European External Action Service (EEAS), including the contribution to Team Europe Initiatives (TEIs) in developing countries.

#### Programming of the instrument and pending steps

In early June 2021 the European Parliament adopted the NDICI budget, allocating ca €79.5 billion to be used over the next seven years to foster international partnerships on sustainable development, climate change, democracy, governance, human rights, peace and security and beyond.<sup>113</sup> This budget will be backed by a maximum of €53.4 billion External Action Guarantee. So far, the NDICI-Global Europe budget has been divided as follows:

- €60.38 billion for **geographic programmes**, from which at least €19.32 billion are assigned for the Neighbourhood, at least €29.18 billion for Sub-Saharan Africa, €8.48 billion for Asia and the Pacific, and for the Americas and the Caribbean €3.39 billion;
- €6.36 billion for **thematic programmes**: Human Rights and Democracy, Civil Society Organisations, Peace, Stability and Peace Conflict Prevention and Global Challenges;
- €3.18 billion for rapid response actions (Crisis Response and Conflict Prevention, Resilience and linking humanitarian and development actions, Foreign policy needs and priorities)
- A “cushion” of unallocated funds of €9.53 billion could top-up any of these programmes and the rapid response mechanism, to address unforeseen circumstances, new needs or **emerging challenges** and back new priorities.

The Commission services, together with the EEAS are currently working on the EU medium-long term planning for each country, region and thematic programme. The programming of the NDICI-Global Europe should be officially completed by the end of 2021, with the adoption by the Commission of geographic and thematic multi-annual indicative programming documents.<sup>114</sup>

The programming of the NDICI started with an analysis of national development needs and priorities of partner countries, and an identification of EU's priorities and interests. The Commission and the EEAS has discussed (by autumn 2021) with partner countries, EU Member States and other stakeholders, to establish the basis for future EU interventions in the medium-long term. This has included setting specific objectives and indicative allocations for

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<sup>112</sup> The Commission's Directorate-General for International Partnerships (INTPA) is responsible for formulating the EU's international partnership and development policy, with the ultimate goal to reduce poverty, ensure sustainable development, and promote democracy, human rights, and the rule of law across the world. While DGs INTPA and NEAR are responsible for NDICI overall, within the pilot ecosystems related to vocational education and climate smart water solutions the focus is on developing countries.

<sup>113</sup> European Commission (2021). EU external action budget: European Commission welcomes the final adoption of the EU's new long-term external action budget for 2021-2027. Available at: [https://ec.europa.eu/international-partnerships/news/eu-external-action-budget-2021-2027-final-adoption\\_en](https://ec.europa.eu/international-partnerships/news/eu-external-action-budget-2021-2027-final-adoption_en)

<sup>114</sup> European Commission (2021). EU external action budget: European Commission welcomes the final adoption of the EU's new long-term external action budget for 2021-2027. Available at: [https://ec.europa.eu/international-partnerships/news/eu-external-action-budget-2021-2027-final-adoption\\_en](https://ec.europa.eu/international-partnerships/news/eu-external-action-budget-2021-2027-final-adoption_en) and the delegated act which entered into force on 10 October 2021 part of the legal framework for the implementation of NDICI-Global Europe : [EUR-Lex - 32021R1530 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/eli/reg/2021/1530/oj)

EU actions at country, regional and thematic level. The final step will be to identify and formulate specific interventions per country/region (in the case of geographic programmes) or per theme (in the case of thematic programmes) on an annual basis, and adopt financing decisions accordingly. The result of this programming will be not only the 'what' but the 'how' of the EU's cooperation engagement.

What is known so far about the types of financing<sup>115</sup>

The NDICI-Global Europe support will allow the EU to promote public and private investment worldwide in support of sustainable development. Article 27 of the NDICI Regulation provides the full list of types of financing that can be provided by the NDICI, which is in line with the forms of Union funding envisaged by the Financial Regulation. These include grants, procurement contracts for services, suppliers or works, budget support, contributions to trust funds set up by the Commission, financial instruments, budgetary guarantees, blending operations, debt relief, financial assistance and remunerated external experts (technical assistance).<sup>116</sup>

Financial instruments, budgetary guarantees and blending operations under the NDICI will be implemented, when possible, under the lead of the EIB, a multilateral European finance institution (e.g. the European Bank for Reconstruction and Development) or a bilateral European finance institutions (e.g. development banks), possibly pooled with additional forms of financial support both from Member States and third parties. These financial instruments may be grouped into facilities for implementation and reporting purposes.

Organisations and all other legal entities (e.g. civil society organisations, legal persons) established in the EU Member States, the neighbourhood partner countries and developing countries can participate in procurement, grant and prize awards procedures for actions financed under the geographic and thematic programmes. However, eligibility rules may be restricted to certain nationalities, geographical location or nature of the applicants depending on the specific nature and objectives of the actions and their effective implementation.

To avoid disruptions in Union support, during a limited period of time at the beginning of the 2021-2027 MFF and in justified cases, a grant may be awarded retroactively for actions and costs from 1 January 2021, even if those actions were implemented and those costs were incurred before the grant application was submitted.

Potential opportunities and concerns when aiming to mobilise finance for SDGs

When considering the potential role of NDICI in enabling accelerated mobilisation of SDG aligned finance for developing countries, the aspect of consolidating and coordinating can be seen as an opportunity. Instead of multiple instruments, these are now streamlined under the NDICI and are subject to a common set of rules, which should also increase member

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<sup>115</sup> Note text written in November 2021

<sup>116</sup> REGULATION (EU) 2021/947 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 June 2021 establishing the Neighbourhood, Development and International Cooperation Instrument – Global Europe, amending and repealing Decision No 466/2014/EU and repealing Regulation (EU) 2017/1601 and Council Regulation (EC, Euratom) No 480/2009. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0947&from=EN>

country collaboration and coordination, and contribute to stronger SDG impacts. A priori this could help better engage responsible private sector stakeholders, SDG solutions providers and private finance overall, noting the still massive (USD 3.7 trillion per year) SDG financing gap.<sup>117</sup>

Meanwhile some concerns have been expressed with respect to potential negative effects of this new instrument with regards to the partner countries' ownership and human development, i.e. more interest-driven cooperation approaches might affect the ownership of partner countries.<sup>118</sup> The dynamics will depend on the bargaining power of the partners vs those of the EU member states, which will differ from country to country. A key challenge in the programming exercise will be addressing the trade-off between the 'policy first' approach and focus on EU strategic priorities vs. the respect of country ownership and alignment to country needs, to ensure that cooperation genuinely pursues mutual interests and delivers SDG impacts.

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<sup>117</sup> OECD (2020), Global Outlook on Financing for Sustainable Development 2021: A New Way to Invest for People and Planet, OECD Publishing, Paris

<sup>118</sup> European think Tanks Group (ETTg) (2021). Programming the NDICI in times of COVID-19: Five takeaways from a recent webinar. Available at: <https://ettg.eu/blog-posts/programming-the-ndici-in-times-of-covid-19-five-takeaways-from-a-recent-webinar/>