Climate Innovation
Impact Goals
Goal 4 Climate-Smart Agriculture
Foreword

As part of our Theory of Change process, EIT Climate-KIC has developed a series of 12 Climate Innovation Impact Goals (see Table 1). These focus the attention and resources of our community, and offer a way of maximizing synergy and contribution to Europe’s overall 2050 climate change and energy roadmap.

During 2017 we went through a process of consultation to select these Impact Goals and now in 2018, have worked to prepare theories of change tailored to each Impact Goal. This draws inspiration from the EIT Climate-KIC Theory of Change developed last year.

For each Impact Goal, we have prepared a ‘Dossier’; collections of materials that:

- Justify why the EIT Climate-KIC Community believes the impact goal area to be so important.
- Explore the most important levers of change and the need for innovation, in the context of the pathways required for Europe to be on track with the Paris Agreement.
- Assess our current portfolio and what EIT Climate-KIC should do next.

The Dossiers have been designed to support the production of the EIT Climate-KIC Multi-Annual Strategy, and to inform our 2019 EIT Business Plan writing, business development efforts and communications with our Partner community.

The Dossiers have developed out of several evolving workstreams, including: mapping the systems that underpin our Impact Goals, co-creating theories of change, visualising our portfolio and sharing learnings from our organisation on how we deliver systems innovation. In addition to EIT Climate-KIC’s input, our Partner community has fed into and further refined these workstreams through the 22 partner events that have taken place in 2018.

There are several key insights that can be extracted from the Dossiers and the process that EIT Climate-KIC has so far taken in creating them. This has highlighted:

- The importance of working across EIT Climate-KIC internal structures to better understand our Impact Goals; creating the Impact Dossiers has been an exercise of self-reflection and understanding, but also of analysis and forecasting, across EIT Climate-KIC teams.
- EIT Climate-KIC’s previous experiments have supported incremental changes, but these are not enough to help us meet the decarbonisation targets required to build a zero-emission, resilient economy. To harness innovation for fundamental transformational change, we need to shift our focus to be working at a systems level. EIT Climate-KIC has a mandate to identify where innovation is most needed and a responsibility to create the wider framework for systems change.
- We must innovate to influence the intermediary driving forces that transform systems, particularly when they are acting as obstacles to progress. We have sharpened our focus on these drivers (such as policy, finance or skills) and see a need for more deliberate experiments on drivers that have previously been largely unexplored by our portfolio.
- The significance of the areas that lie between and binds together our Impact Goals. To achieve systems change we must not only foster change within these Impact Goals as some form of silo, but capitalise on the relations and inter-connections between them.
- Learnings can be extracted from Impact Goals of differing levels of maturity, for example some have evolved out of Flagships whilst others were created within the last 12 months. This process has
emphasised the importance of learning from our more mature goals and experiments to build innovation communities and interventions around our new goals.

- The importance of creating feedback loops and hypotheses, and capturing learnings from our successes and failures. Our ability to foster innovation communities and experiments is underpinned by our capacity to learn from our actions. EIT Climate-KIC will help foster these learning mechanisms through our Monitoring Evaluation and Learning team, but a culture of deliberate learning and adjustment must be embedded across our Community.

- Historically our priorities have not been embedded across the whole EIT Climate-KIC community. Our Dossiers are an important mechanism to bring all our stands of work – from education, entrepreneurship, innovation, ecosystems and communication – together to transform systems.

### Table 1. EIT Climate-KIC’s Climate Innovation Impact Goals (1-12)

<table>
<thead>
<tr>
<th>Theme</th>
<th>Climate Innovation Impact Goals</th>
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<tbody>
<tr>
<td><strong>Urban Transitions</strong></td>
<td><strong>Goal 1:</strong> Promote retrofit and decentralised energy: Drive a significant increase in urban retrofit rates and enable district-scale clean energy production, paving the way for deep cuts in emissions.</td>
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<td><strong>Goal 2:</strong> Create green, resilient cities: Harness the force of nature in infrastructure design to build livable climate-resilient cities.</td>
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<td><strong>Goal 3:</strong> Accelerate clean urban mobility: Trigger the switch to clean urban mobility to achieve considerable cuts in urban transport emissions.</td>
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<tr>
<td><strong>Sustainable Land Use</strong></td>
<td><strong>Goal 4:</strong> Make agriculture climate-smart: Instigate a substantial increase in the application of climate-smart agriculture solutions.</td>
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<td><strong>Goal 5:</strong> Reform food systems: Transform climate-damaging food value chains and enhance the climate resilience of food supply.</td>
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<tr>
<td></td>
<td><strong>Goal 6:</strong> Nurture forests in integrated landscapes: Grow carbon sequestration in forests and linked value chains, while avoiding deforestation.</td>
</tr>
<tr>
<td><strong>Sustainable Production Systems</strong></td>
<td><strong>Goal 7:</strong> Recast materials production: Catalyse a switch to a circular economy and transform production for fossil-energy intensive materials.</td>
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<td><strong>Goal 8:</strong> Reduce industry emissions: Partner with key industry stakeholders in cutting scope 3 emissions to reach science-based targets.</td>
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<tr>
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<td><strong>Goal 9:</strong> Reboot regional economies: Transition carbon-intensive regions to become zero-carbon innovation hotspots.</td>
</tr>
<tr>
<td><strong>Decision Metrics and Finance</strong></td>
<td><strong>Goal 10:</strong> Mainstream climate in financial markets: Advance metrics, standards and instruments that enable transparent, true-cost and benefit accounting for a well below 2°C pathway.</td>
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<td><strong>Goal 11:</strong> Democratise climate risk information: Enhance access to risk information through capacity building and a major expansion of the climate services market.</td>
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<td><strong>Goal 12:</strong> Foster bankable green assets in cities: Develop capacity in preparing projects and investment vehicles to boost the availability of sustainable investment assets in cities.</td>
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Our Impact Dossiers are the first iteration of a high-level attempt to combine these streams of work and through further review and collaboration, both within and external to EIT Climate-KIC and its Partner community, we will strive to further refine this work throughout 2018.

We will therefore be inviting you, as key members of the EIT Climate-KIC community, to review this work and provide further feedback on our Dossiers.

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Dr. Tom Mitchell,
CSO, Climate-KIC
Theory of Change: Climate Innovation Impact Goal Dossier

Goal 4 Climate-Smart Agriculture

REPORT DATE: 15th June 2018
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Executive Summary

EIT Climate-KIC is Europe’s knowledge and innovation hub for climate-smart agriculture, harnessing digital advances, promoting new techniques and business models while supporting the necessary finance networks and flows to make change possible.

This document aims to capture the importance of climate-smart agriculture, especially in relation to Europe’s 2050 decarbonisation challenge. It also describes how climate-smart agriculture is impacting the societal transformation in Europe, while addressing EIT Climate-KIC’s contributions to the Sustainable Development Goals through its work on climate-smart agriculture. The document also gives rise to why there should be a focus on EIT Climate-KIC by providing a track record on what EIT Climate-KIC has done, doing, and will do regarding climate-smart agriculture. This is cemented through an illustration of some of EIT Climate-KIC’s interventions and projects within the climate-smart agriculture area.

In order to achieve our impact goal of making agriculture climate-smart and increase the application of CSA solutions by a magnitude, we will work towards 3 outcomes identified through our Theory of Change exercise:

- Link diverse actors across the agrifood value chain by creating a multi-stakeholder open innovation platform, growing local ecosystems and activating behavioral and dietary changes.
- Catalyze the application and adoption of CSA innovations via identification, assessment, validation and scaling of CSA solutions.
- Accelerate and de-risk CSA investments by creating data analytics and tools, developing public-private financing schemes and insurance mechanisms, and blending climate and agriculture finance.

We have identified outputs and activities that link to each of these outcomes, designed to activate key leverage points that will drive systematic change in the agrifood space. These outputs include “platform” projects that will build capacity and infrastructure of the CSA Booster and grow its ecosystem, and a portfolio of innovation projects focused on specific high-impact themes aiming for impact and sustainability, engaging multi-stakeholder partners including start-ups.

Finally, given the interconnectedness of the supply chain, the food and agriculture sectors – agrifood – are increasingly being viewed as a single industry that spans the entire value chain (VC) from farm to fork. This holistic approach is needed to break the current silos and link the diverse actors along the agrifood VC. Therefore, the CSA Booster collaborates closely with its colleagues working on Impact Goal 5 on transforming food value chains.
1. Introduction

1.1 Why is this impact goal important?

Climate change is exacerbating the challenges faced by the agriculture sector. Climate change-induced increases in temperatures, rainfall variation and the frequency and intensity of extreme weather events are adding pressure on the global agriculture system – which is already struggling to respond to rising demands for food and renewable energy. Agriculture is also contributing a significant share of the greenhouse gas (GHG) emissions that are causing climate change – 17% directly through agricultural activities and an additional 7% to 14% through changes in land use.\(^1\)

Against this backdrop, today’s agricultural production systems need to be transformed to achieve greater productivity, be more resource efficient, and become more resilient to risks, shocks, and long – term climate variability. Climate –smart agriculture (CSA) attempts to develop and offer sustainable solutions to these issues. Climate-smart agriculture is an integrated approach that addresses the interlinked challenges of food security and climate change.

As global food demand grows, the share of agriculture in the EU’s total emissions will rise to about a third by 2050. The EU, therefore, has realised that it is not too late to reshape the agriculture systems. As such, the EU has developed a long term strategic approach to the role agriculture and other land – using sectors play towards accelerating Europe’s low carbon transition. The EU is already investigating the necessary changes that would support the vision of establishing a low carbon or net zero emitting agriculture sector. In fact, earlier this year, EU availed 1.5 million euros fund to help 140,000 smallholder farmers in Southern Africa adopt new innovations aimed at transitioning from traditional to climate smart agriculture solutions.\(^3\)

Globally, there is a call for greater investment – particularly in the developing countries. It is in these areas where the potential for increasing agricultural productivity and production are greatest. In 2017, the European Commission announced a 1 billion Euro investment.\(^4\) towards knowledge and innovation in agriculture, food, and rural development.

Related, as part of the EU External Investment Plan, a volume of between 200 – 300 million Euros will be invested into sustainable agriculture, rural entrepreneurs, and agri-business.\(^5\) The announcement was made in 2017 and is to support investment opportunities for the private sector that achieve sustainable, low – carbon, climate resilient, and inclusive growth along the agricultural value chain.

The transformation of agriculture goes hand in hand with the transformation of our food systems and as such contribute and accompany the societal evolutions required to achieve the SGD targets and the Paris Agreement. In most cases however, agriculture is not the driving force because the food system is more influenced by the complex relationship between agri-food industry and consumers. This, however, may

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1 Trade and Agriculture Directorate OECD. (September 2015). Agriculture – Climate Change.
3 Smith, Georgina. (April 2018). EU HELPING SMALLHOLDER FARMERS BECOME CLIMATE SMART. Centre for Agricultural and Rural Cooperation.
5 Ibid
change as new short and local value chains develop. Such value chains reconnect consumers and producers and place farmers in a new position where they become actors of the transformation.

Across the past 20 years, CSA has become a priority in the global debate around agriculture. In fact, since the inception of CSA, there have been many success stories that illustrate the effectiveness of adopting CSA practices.

The World Bank Group, for example, has committed to deliver CSA that achieves the ‘triple win’ of increased productivity, enhanced resilience, and reused emissions. One example is China. Since 2014, China has looked to implement climate smart agriculture. The country experienced better water use efficiency across 44,000 hectares of farmland paired with a production boost of rice by 12% and maize 9%. Mexico is another example. Mexico focused on pursuing environmentally sustainable energy technologies, which resulted in a CO2 reduction of 3,388,670 tons.

The Food and Agriculture Organisation (FAO) are also a key player in pushing for more climate conscious agriculture practices. More specifically, the FAO’s Mitigation of Climate Change in Agriculture Programme has helped 2500 farmers in Tanzania and Kenya train in relevant CSA practices.

From a financial lens, Rabobank has offered to help fund CSA. In October 2017, Rabobank and UN Environment forged a billion-dollar partnership to kick-start climate-smart agriculture. The agreement looked to explore existing and new best practices around decreasing agriculture’s footprint, while restoring the quality of present land use for agriculture.

The above provides a glimpse into the appetite for CSA and who is looking to raise the profile of CSA to the extent that it overshadows traditional agriculture methods.

In terms of linking to the Sustainable Development Goals (SDGs), SDG 2 is a key focus, but we also work on others highlighted below. How can the SDGs be addressed, food security enhanced, start-ups supported, and Europe’s agrifood sector enabled for sustainable growth past 2020? Four key channels preside along the agrifood supply chain, ripe for engagement:

<table>
<thead>
<tr>
<th>SDG</th>
<th>Goals and Targets</th>
<th>EIT Climate-KIC’s contribution</th>
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<tbody>
<tr>
<td>SDG 2</td>
<td>2.4.1 (proportion of agriculture area under productive and sustainable agriculture)</td>
<td>Boosting agricultural productivity by facilitating investment to improve crop productivity and boost agricultural yields through better use of resources, innovation and cutting food waste. For example— achieving the “maximum” potential of a wheat field, would deliver 40-42 tons per hectare per annum, but today’s average yield is between 2 and 10 metric tons per hectare.</td>
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<tr>
<td>SDG 3</td>
<td>3.9 (reduce the number of deaths and illness from hazardous chemicals and air, water and soil pollution and contamination)</td>
<td>Boosting climate adaptation and food security by encouraging sustainable land use and agricultural practices and building farm and forest resilience to climate change and extreme weather events. In the usage of nitrogen (key ingredient in fertilizer) there is a huge gap between potential impact of a given amount of nitrogen and its actual maximum potential. In other words, if nitrogen use was better optimized, then farmers could be using a lot less fertilizer (consuming up to 60% less nitrogen per hectare), reducing costs and environmental impact.</td>
</tr>
<tr>
<td>SDG 9</td>
<td>9.4.1 (CO2 emissions per unit of value added)</td>
<td>Boosting climate mitigation efforts by reducing and sequestering global greenhouse gas (GHG) emissions from agriculture and food supply chains (especially CO2, methane and nitrous oxide). Precision services, facilitated through the use of drones, have become a critical part of agriculture—whether for zone sampling, imagery, yield monitoring, or GPS guidance of farming vehicles.</td>
</tr>
</tbody>
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7 Ibid
8 Food and Agriculture Organization of the United Nations. (2013). FAO Success Stories on Climate Smart Agriculture. FAO Climate – smart Agriculture Sourcebook.
9 Rabobank. (October 2017). Rabobank and UN Environment kick-start $1 billion program to catalyse sustainable food production. Press Releases.
Traditional brick and mortar shops are also making way for online options to offer logistical and operational efficiencies—for example cooking at home through organisations like Blue Apron, who discarded 5.5% of food (waste) versus the US average of 10.5% in grocery stores.

<table>
<thead>
<tr>
<th>SDG 12</th>
<th>Responsible consumption and production patterns</th>
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<td></td>
<td>CSAb works across European supply chains and partners with national, regional and international governments, research organisations, NGOs, entrepreneurs and big business to unlock climate-smart innovation in Europe’s farming, forestry and food sectors—both to meet the demands of Europe’s own sustainability goals and Horizon 2020 aims, but as well to be a responsible global citizen in the road to addressing the SDGs, particularly SDG #12.</td>
</tr>
</tbody>
</table>

Applicable across all goals, we are boosting education and understanding of climate-smart agriculture, innovation and best practice. This will result, at the end of the supply chain, customers who are fully informed and making decisions on fact rather than marketing.

1.2 Why should it be a focus for EIT Climate-KIC?

Despite new technologies and solutions (see below), how to successfully move from case study findings to scaling up practices remains a challenge, and understanding which type of policies and institutions best support climate-smart farming, must be identified and then worked with to support achievement of this goal.

Another barrier is how to play a part in farmers’ decision-making process, to address the inherent issues preventing uptake of CSA, and identifying the channels around information dissemination.

For example, better analysis on who gets the information, and what type of information is communicated, local or national rainfall indications for example, while finding solutions to potential information gaps and unequal information dissemination, is needed.

Another barrier is the lack of scientists linked to practitioners. Climate-smart agriculture implementation needs stable, nationally supported institutions that take on the challenge of integrating flexible and climate-sensitive policies. This is a barrier of political will. Climate-smart agriculture research findings must be convincing, and then disseminated to support effective decision making.

“There is no scientific support system for policy-makers and development organisations in many African countries. Few can support a prioritization of practices or support development of sound climate-smart agriculture policies.”

10 Dr. Laurent Sedogo (2015).

Working with multi-stakeholders is another barrier as interests are diverse and must be aligned. CSAb attempts to solve for this by working with research centres, governments and other institutional partners to support the transition to climate-smart agriculture. It aims to use economic and policy analysis when looking at impacts, effects, costs and benefits to address barriers to adopting CSA.

Finally, coordination is a barrier, following the logic above, and is particularly important among national agriculture policies, strategies and investment plans and climate change instruments including national adaptation programmes (NAPs) and national appropriate mitigation action (NAMAs) and climate change

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investment plans. CSAb is attempting to link these, embedded in EU and national decision making, community level projects, and finally in the start-ups.

Traditional agricultural methods, unfortunately, are simply not sustainable enough to achieve food security for a rapidly growing population. To tackle these challenges, innovation is essential and can be achieved through investing in, for example, climate-smart agriculture.

With arable land, grazing areas and water resources becoming scarcer, resolving this challenge can be through intelligent agriculture research. This means linking the grass-root knowledge of farmers with clever innovation. This, in turn, could bring an increase in the required productivity, while safeguarding the environment and biodiversity for future generations.

Systems innovation allows for a fuller picture to help assess the challenge at hand. Action on scaling Climate smart agriculture for example, also has important synergies with other 2030 climate innovation challenge areas, such as on innovation Goal 5 on transforming food systems. Currently the CSA Booster is more focussed on the production side of the agriculture value chain, while food systems focus more on demand-side dynamics. Nonetheless, re-connecting food demand and agriculture is vital for achieving transformation in the sector. This connection constitutes a big systemic challenge since it requires to deeply transform the relations between consumers and producers currently mediated by a series of highly influential value chain actors. It is indeed important to emphasise that the agri-food sector is very fragmented currently, where business oligopoles dominate. With food security for all currently being a ‘live’ debate, disruptive innovation needs to take place to spark sustainable solutions. Employing incremental change is no longer feasible.

In the context of climate-smart agriculture a multi-partner/multi-stakeholder approach provides a connection between providers and users of CSA solutions.

The agriculture sector lends itself to many stakeholders. Some of the stakeholders are, but not limited to, researchers, farmers (production side), society (consumption side), and industry. Each one of the listed stakeholders influence each other.

Focusing on the private sector, innovation around agricultural solutions tends to be developed based on pure economics, with explicitly considering sustainability. This is a prime example of why taking a multi-partner/multi-stakeholder approach provides a safe space to discuss what everyone is doing and, perhaps, by leveraging off each other’s expertise sustainable solutions can come about.

Another key stakeholder is the consumer. Consumers have for decades been primarily interested in rather cheap and affordable food commodities, but they are now more also inclined to care about the source of their food for health and environmental reasons. In the past, consumers had a less vocal role but are now demanding food that is sustainable. Involving such a group in discussions about improving the sustainability of agriculture is imperative, as consumers can drive the trends on what needs to be supplied.

In Europe, there is still a large disconnect between research and the private sector regarding agriculture. There, however, lies an opportunity to transform the agriculture system within Europe to enable and leverage solutions that could be replicated on a global scale.

As such, it is important that EIT Climate-KIC is aiming for a truly pan – European reach. Such a platform will encourage acting local, through the expertise and tools of an international network to boost climate-smart agriculture practices.
One key example from EIT Climate-KIC is the Climate-smart Agriculture (CSA) Booster flagship, coupled with an international network of partners, accelerating the adoption and scaling of climate-smart technologies and solutions across Europe’s agri-food sector. The details of EIT Climate KIC’s Climate-smart Agriculture Booster (CSAb) will be further developed in the sections below. CSA Booster is Europe’s knowledge and innovation hub for climate smart agriculture, promoting new techniques and business models.

The World Bank Group, for example, started a Climate-smart Agriculture Project for Kenya in 2017. The project’s aim was to increase agricultural productivity and build resilience to climate change risks in the targeted smallholder farming and pastoral communities in Kenya. This would resonate well with EIT Climate KIC, as there has been contact with the World Bank Group to potentially collaborate over climate finance for agriculture.

Climate Technology Centre and Network, hosted by UN Environment Programme, published (in 2017) a Climate-Smart Agricultural Manual for Zimbabwe. The Manual describes technologies that are in line with the CSA principles i.e. food production adaptation and mitigation - all associated with the agriculture sector. The chapters in the Manual facilitate the development of methodologies associated with climate change mitigation and adaptation, food security, and sustainable development. Together, the Manual is to highlight the importance of assessing the mitigation and adaptation benefits of identified practices which increase productivity.

CSAb is one of EIT Climate-KIC’s flagship innovation programmes for tackling the challenges within the agriculture sector. The purpose of the CSAb is to incubate and accelerate the commercialisation, adoption, and scaling of low carbon – ‘climate smart’ – technologies. This is through a multi-stakeholder ecosystem of public and private sector partners, including some of the leading research institutions in Europe, corporates, start-ups, and international organisations. The CSAb also adds values since this initiative is pioneering the transition to climate-smart agriculture across Europe, and around the world.

By mid-2018, CSA Booster had over 50 partners and activities across Europe in all major regions. The platform also acts as the European regional hub for the Global Alliance for Climate-Smart Agriculture initiative (GACSA). CSA Booster is also registered on the UN Environment’s Climate Initiatives Platform - a database for international non-state cooperative climate initiatives supporting the Paris Agreement.

- Having launched the CSAb flagship, one of the standout by-products has been Agrisource. Agrisource is Europe’s first open innovation platform dedicated to climate smart agriculture. The platform permits collaboration, co-creation and matchmaking between stakeholders and helps fill the gaps between supply and demand for CSA technologies and services. International organisations such as the European Bank on Reconstruction and Development (EBRD) are interested in working with EIT Climate-KIC on Agrisource.
- CSA Booster also teamed up with the University of Reading and Future Learn to create a new MOOC (massive open online course) introducing climate – smart agriculture. The MOOC launched in January 2017 supported by Wageningen UR and the French National Institute for Agricultural Research (INRA) and attracted over 5000 participants in the first year. The MOOC has been translated into French, German and Chinese and these versions will be launched in Q4 2018, hosted by EIT Climate-KIC Education.
- EIT Climate-KIC also have a track record of funding start-ups that bring innovation to pockets of the agriculture food chain. Below is a ‘deep dive’ into three selected start-ups in the CSA Booster.

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12 UN Environment Programme. (June 2017). Climate-Smart Agriculture Manual for Zimbabwe, Climate Technology. Centre and Network, Denmark
13 Climate KIC. (2018). We are Europe’s climate-smart innovation hub and community for agriculture. CSA Booster
14 Ibid
- **Carbon Delta** – this Swiss fintech start-up is working with University of Oxford to unlock asset-level data through remote sensing technology by:
  - Creating methodologies and approaches to measure Scope 1 GHG emissions from company assets, including in power generation, heavy industry, and agriculture;
  - Deploying these methodologies and approaches to measure Scope 1 GHG emissions of company assets in those sectors; and
  - Identifying environmental features of technology at company assets in those sectors.

- **CO2i** – Oxford spinoff start-up CO2i is working on the DryGro Animal Feed Scale Trials project focused on testing a new technique for growing animal feed protein ingredients on arid land with up to 90% less water. This technique would allow for the replacement of large amounts of soy meal within the animal feed value chain with an alternative crop, Lemna (commonly called Duckweed).

- **Agvesto** – Agvesto is working on developing a Green bond and Climate Bond risk and pricing platform using Agvesto’s current platform that is primarily used towards Insurance and Insurance Linked Securities markets.

- **Novihum** – This German start-up is working with Brandenburg University of Technology Cottbus-Senftenberg (BTU) to commercialize a soil additive to improve soil productivity and resilience. The company developed humus granulate derived from lignite. The improvement of substrate properties with conventional humus is effective but requires a lot of time and effort. With NOVIHUM the required humus content is already achieved in a single work step. Results from a greenhouse experiment in 2015 indicate that the application of both NOVIHUM granules and Biochar lead to an increase in crop yields exceeding those of plants that received conventional fertilizer.

- To grow local ecosystems and engage with local stakeholders and partners, CSA Booster has set up regional hubs in France, Italy and Netherlands. A new CSA Hub in the Nordics will be launched this year and it is also working with FAO and GACSA (Global Alliance for CSA) to assess the viability of a CSA Hub in the CEE (Central and Eastern Europe) region.

- **EIT Climate-KIC Education** has also developed relevant educational materials with our partners. One example is Spotlight 2017: Copernicus - From geospatial to agribusiness (October 25, 2017):
  - Copernicus is a European Union Programme aimed at developing European free and open information services based on satellite Earth Observation and in situ (non-space) data to help service providers, public authorities and other international organisations improve the quality of life for the citizens of Europe
  - Copernicus helps assess agricultural land uses, change detections and their impacts on biodiversity and landscapes so to help public authorities and farmers improve farm management and policies by monitoring agricultural pressures on natural resources.
  - Through this training, participants could improve their knowledge on systemic approaches in using Copernicus satellite data and monitoring services in combination with some open source tools for image and data processing, to support innovation in sustainable agribusiness by:
    a) Understanding what Sentinel satellites and Copernicus Services are, why they are important and how they relate to the green and climate challenges;
    b) Using key approaches and tools for designing new analytics models or reconfiguring existing ones based on earth observation;
    c) Implementing sustainability-oriented methodologies to address climate challenges in agriculture activities
2. Theory of Change

2.1 How can society tackle climate change through systems innovation and transformation?

Scientific models tell us that if we are to avoid the worst impacts of climate change (above 2 °C), Europe must stop being a net emitter of greenhouse gases by 2050 at the latest. While there are some encouraging signs of progress, we are currently only taking baby steps towards this target. To be on track, the evidence is that we need to be cutting emissions at least six times faster than we are now. Gradual improvements are not going to be enough to achieve the scale and speed of decarbonisation we need. Instead, we need change that is much more radical; in the way all of us live, work, travel and play.

We believe that this challenge presents that world’s biggest, most exciting and most urgent innovation opportunity. As Europe’s foremost climate innovation network, EIT Climate-KIC has the responsibility to act and offer a **Theory of Change** for how Europe is going to achieve its decarbonisation and resilience targets, and create jobs and growth in a new climate-compatible economy. This must be credible, bold, inclusive, radical and inspiring.

We are working towards an inclusive, climate resilient society with a circular, zero emissions economy. Our economy won’t generate waste, won’t emit greenhouse gases and people will have the capacity to adapt to a changing climate that minimises negative impacts. By 2050 at the latest, buildings, industry and transport must not be contributing to emissions and land-use should be net-zero emissions too. By 2050, everyone should have the ability and the capacity to avoid, reduce and minimise remaining climate change impacts.

But 2050 may be too far in the future to be motivating, so we have set nearer term, 2030 Climate Innovation Impact Goals that we will contribute to achieving. These serve as a lightning-rod for our combined efforts, pinpoint where innovation is most needed and provide an indication of whether we are on track for 2050. These impact goals have been chosen by our community for (a) their consistency with the Sustainable Development Goals, (b) the precise nature of Europe’s decarbonisation and resilience challenges and (c) where our collective expertise is concentrated. These goals are focused on cities, land-use, industry and finance.

**Our impact pathway**
Transformation of whole systems (such as those detailed by our impact goals) can be achieved by exposing the weaknesses of existing systems and nurturing something better. We can contribute to this by unleashing a series of strategically-targeted experiments on the different forces that shape such systems. For example, the future of urban transport in Europe will be influenced by policy and regulation, finance and investment trends, people’s behaviours and choices, and the technologies and skills people possess. EIT Climate-KIC will build on our existing work to assemble a portfolio of experiments that enact on these forces simultaneously; testing and learning what works and helping to create a stronger agency that leads to change. We want to catalyse and instigate options, momentum and excitement that gives Europe a chance for achieving 2050 targets. Innovation in just one area alone will not be enough, so instead we must connect communities of change-makers across Europe and beyond, to reach tipping points quickly.

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15 A Theory of Change is essentially our hypothesis for how change happens and the pathways we need to follow to achieve our vision.
Table 1 shows EIT Climate-KIC’s Innovation Impact Goals, with cities, land-use, industry and finance describing the systems requiring change.

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</tr>
<tr>
<td></td>
<td>• Goal 3: Accelerate clean urban mobility: Trigger the switch to clean urban mobility to achieve considerable cuts in urban transport emissions.</td>
</tr>
<tr>
<td>Sustainable Land Use</td>
<td>• Goal 4: Make agriculture climate-smart: Instigate a substantial increase in the application of climate-smart agriculture solutions.</td>
</tr>
<tr>
<td></td>
<td>• Goal 5: Reform food systems: Transform climate-damaging food value chains and enhance the climate resilience of food supply.</td>
</tr>
<tr>
<td></td>
<td>• Goal 6: Nurture forests in integrated landscapes: Grow carbon sequestration in forests and linked value chains, while avoiding deforestation.</td>
</tr>
<tr>
<td>Sustainable Production Systems</td>
<td>• Goal 7: Recast materials production: Catalyse a switch to a circular economy and transform production for fossil-energy intensive materials.</td>
</tr>
<tr>
<td></td>
<td>• Goal 8: Reduce industry emissions: Partner with key industry stakeholders in cutting scope 3 emissions to reach science-based targets.</td>
</tr>
<tr>
<td></td>
<td>• Goal 9: Reboot regional economies: Transition carbon-intensive regions to become zero-carbon innovation hotspots.</td>
</tr>
<tr>
<td>Decision Metrics and Finance</td>
<td>• Goal 10: Mainstream climate in financial markets: Advance metrics, standards and instruments that enable transparent, true-cost and benefit accounting for a well below 2°C pathway.</td>
</tr>
<tr>
<td></td>
<td>• Goal 11: Democratise climate risk information: Enhance access to risk information through capacity building and a major expansion of the climate services market.</td>
</tr>
<tr>
<td></td>
<td>• Goal 12: Foster bankable green assets in cities: Develop capacity in preparing projects and investment vehicles to boost the availability of sustainable investment assets in cities.</td>
</tr>
</tbody>
</table>

Table 1. EIT Climate-KIC’s Climate Innovation Impact Goals (1-12)

Around each of our themes and impact goals, our portfolio of experiments focuses on leveraging change in finance, policy, skills, behaviours, and technologies. It builds on existing work to include the following:

- Experiments designed to accelerate learning and foster collective action in networks of high ambition places and organisations that are committed to transforming systems (climate innovation ecosystems and flagships).
- Testing innovative ideas, whether through start-up businesses or early-stage, exploratory innovation projects (entrepreneurship and early stage innovation).
- Trialling bigger demonstrations of innovations and pathways to scaling their uptake and impact (larger stage innovation).
- Taking the best and brightest and nurturing their skills to be leading climate innovation change agents.
- Exploring how communications, collaboration platforms, knowledge and learning processes can influence people’s behaviours and catalyse social movements.

We will continually assess the results of these experiments in terms of the prospects for change, and regularly adapt our approach.
2.2 Our Theory of Change in Impact Goal Area 4

Figure 1. The Theory of Change in Impact Goal 4 Climate-Smart Agriculture
3. Our Portfolio and Approach

3.1 How does EIT Climate-KIC understand the system associated with the impact goal?

System Mapping
To develop and set out the theory of change at the goal level, EIT Climate-KIC has followed a process facilitated by the system change and sustainability non-profit Forum for the Future. The stages of this process are illustrated in the figure below. It starts with a review of the current articulation of the goal and a discussion on what the change the goal is creating is. Through a set of questions EIT Climate-KIC built its understanding of what the system is that we need to create change within, in order to further our goal and to set clear in-out scoping boundaries for this system. The next stage was to map this system as it currently is. This was done onto the Multi-Level Perspective Framework, an analytical approach to describe processes of innovation and transitions in socio-technical systems with the aim of better understanding the context for system innovation projects.

A joint system map and theory of change was developed for Goals 4 and 5 as they are closely linked in scope within agriculture and food systems. They built upon the outputs from partner days where they developed the system map to inform their theory of change.

Identifying Leverage Points
Through discussion and EIT Climate-KIC’s existing analysis the next stage was to identify potential leverage points in the current system that if activated would create change towards the outcome of the impact goal. We then rated the current ability of EIT Climate-KIC to activate each leverage point against ‘resources’ and ‘power’. Resources include skilled staff, financial funding; power includes remit, agency with the stakeholders involved. This enabled us to understand which leverage points we are already equipped to have high impact with and those that we would need to increase power and/or resources to activate.

Reviewing the Portfolio Hypotheses
We then reviewed the hypotheses within our current portfolio of projects and initiatives that support the goal to review which leverage points these currently activate and how they cumulatively impact the goal.

Theory of Change
Recording assumptions ensures that there is an understanding of what those developing the theory of change are relying on outside of the agency they have to run their portfolio of work that is nonetheless important to its success.
Figure 2. Systems Map on Impact Goal 4 Climate-Smart Agriculture

The Sustainable Land Use System: Make agriculture climate smart, Reform food systems

Trends Supporting the Goal:
- Agriculture and aquaculture: raising crops, livestock, and seafood
- Changing consumer demands: meat protein, less processed food
- Non-food processing: extraction of biomaterials from agricultural crops and products
- Food processing: manufacture of prepared food products and ingredients
- Manufacturing and agricultural inputs: agrochemicals, farm machinery, seeds, livestock pharmaceuticals
- Modern consumer mindset: more volume ever cheaper

Trends Opposing the Goal:
- Food and agriculture (agri-food) is a $7.8 trillion industry
- A growing global population set to reach 9 billion in 2050
- Food waste: US, 40% food wasted and food loss and account for 8% of CO2 emissions
- Fragmented markets
- Food systems: indoor farms — high-tech greenhouses, automated vertical farms
- Food in venture capital: VC funds like impact investors and social entrepreneurs invest
- On the consumer side: companies working with growers to address supply chain challenges
- On the agriculture side: farming cooperatives with powerful food brands, and portfolio on retail, grain trading, food processing
- Agro-business marketplaces startups to enable farmers, retailers and distributors
- The CSA approach: sustainable agricultural development under climate change

The Goals of the System:
- Public Goals: Develop an European agrifood sector with reduced CO2 emissions, resilient and sustainable
- Underlying Goals: Climate-smart agrifood: development of technical, policy and investment conditions for sustainable agriculture and food security
Then we rated the current ability of EIT Climate-KIC to activate each leverage point against ‘resources’ and ‘power’. Resources include skilled staff, financial funding; power includes remit, agency with the stakeholders involved. This enabled us to understand which leverage points we are already equipped to have high impact with and those that we would need to increase power and/or resources to activate.

Based on the analysis of leverage points and the cumulative impact of our current portfolio EIT Climate-KIC then assessed which leverage points to include in our theory of change for the goal, which current activities we wanted to continue in the portfolio and what new activities we wanted to introduce, reviewing this against the ambition of the ultimate impact goal. We also recorded the assumptions EIT Climate-KIC is holding that need to be true for the theory of change to reach the impact goal and the wider enabling conditions they relied upon. Below are the assumptions underpinning the systems map:

- Consumers are now more inclined to care about the source of their food, in particular the food’s environmental footprint. In the past, consumers had a less vocal role but now are demanding food that is sustainable.
- EIT Climate-KIC is Europe’s knowledge and innovation hub for climate smart agriculture, promoting new techniques and business models.
- The Climate Smart Agriculture Booster, coupled with an international network of partners, accelerates the adoption and scaling of climate smart technologies and solutions across Europe’s agri-food sector.

The process of developing a Theory of Change results in a number of choices for EIT Climate-KIC:

- Competent, experienced and motivated employees in the right roles
- Frank and honest communications
- Strong and courageous leadership
- Focus and realistic expectations
- Strategic and financial stability and predictability
- Efficient decision making
- Responsibility and accountability
3.2 How are we currently intervening in the system?

Transforming entire systems does not only require a good understanding of the systems themselves, but also a good understanding of how EIT Climate-KIC is currently intervening in them. To capitalise on the relations and inter-connections between the interventions, we are taking a much stronger “one portfolio approach” in which we treat all we do as contributing to one or more Impact Goal(s).

On the following page, we have included a graphical representation of our 2016-2017 portfolio addressing the Impact Goal to provide you a snapshot of the work we have done over the past couple of months. You will see funding, intervention types (types of programmes), driving force focus, geographic spread and stakeholder type breakdowns - the sort of information that can be valuable in making choices about where we put our efforts and resources.
Goal 4: Make agriculture climate-smart

Total Funding: €10,436,000

Organised by Intervention Types

- Flagship: CSA €5.4m
- Thematic: €3.2m
- Demonstrator: €495k
- Scalable: €455k
- Scale-up: €355k
- Proof of concept: €327k
- Preproof: €193k

Organised by Stakeholder Types

- Academia: €3m
- Business: €2.8m
- Investor: €2.3m
- Business angels: €807k
- B2B: €455k
- Startups: €417k
- Public Administrations: €355k

Organised by Geography

- DACH
  - Germany: €2.2m
  - Switzerland: €747k
- Nordics
  - Norway: €70k
  - Sweden: €185k
  - Denmark: €20k
- Mediterranean
  - Spain: €88k
  - France: €1.8m
  - Italy: €575k
- UK & I
  - UK: €2.4m

- Benelux
  - Netherlands: €1.8m
- Americas
  - Mexico: €2k
- NA

Total Interventions: 63

Organised by Single Interventions

- Total Funding: €2,010,980

Organised by Top 10 stakeholders

- "l'Institut national de la recherché agronomique" / France: €1,026,902 (19)
- Imperial College of Science, Technology and Medicine / United Kingdom: €1,006,131 (5)
- Wageningen Research / Netherlands: €979,064 (13)
- South Pole Carbon Asset Management Ltd. / Switzerland: €863,550 (12)
- Wageningen University / Netherlands: €630,386 (7)
- Climate-KIC AG / Switzerland: €487,068 (2)
- Dry Gro / United Kingdom: €460,737 (1)
- World Business Council for Sustainable Development / Switzerland: €416,972 (2)
- CNR-IBIMET / Italy: €356,363 (9)
- "The University of Reading" / United Kingdom: €324,876 (5)

Key

- Driving force
  - Information / Knowledge
  - Individual behaviour
  - Finance
  - Technology
  - Skills
  - Policy
  - No driving force
  - Startup

Data shown for combined years of 2016-17. All figures rounded to nearest thousand. The figures show the total intervention funding (i.e. EIT-funding + Co-funding).
What is important to note is that while an intervention might be addressing multiple driving forces, the current view only captures one of them (the one we considered as main contributor) due to the static format this is taking. See ANNEX 1 for more background information on the data and design of the visuals.

A few highlights to note from the preliminary analysis are:

- The Climate Smart Agriculture Flagship (CSA) is a key driver in the area and involves the largest number of stakeholders.
- Funding is rather evenly distributed amongst research, higher education and SME’s in this Impact Goal.
- Underrepresented Driving Force in this visualisation are “market structure”, which has almost the same weighing as “Information/ Knowledge”, and “Policy” which is addressed by demonstrators.

This is just the beginning. For the next development round, we are exploring ways to make these portfolio views more dynamic and interactive to facilitate learning across the EIT Climate-KIC network.

### 3.3 What have we learned from our interventions?

EIT Climate-KIC have supported a range of initiatives in the Climate-smart Agriculture space, including the CSA Booster Flagship highlighted earlier. Activities are focussed around the key levers of change identified for this sector, including:

1. Increased resilience is a key leverage point for farmers who are confronted daily with climate risks and provides an important entry point for getting their attention and winning their trust.
2. Information technologies including data analytics and tools can reduce the costs of production? And facilitate the implementation of climate smart solutions.
3. Innovation in insurance and financing mechanisms for farmers, helping to de risk investment in implementing CSA solutions.
4. Value chain actors and decision makers are key levers for scaling CSA solutions, especially for mitigation solutions.
5. Public polices, at all levels can support or be barriers to new solutions. Agriculture is highly regulated in Europe and CSA is working on linking policy analysis to specific solutions where relevant. Agricultural policy need to be simplified and harmonized and policy makers need to be better informed and educated on the key issues in the sector.

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Cool Farm Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact</strong></td>
<td>The Cool Farm Tool is intended to be used by individual farms, the tool is mostly used by Alliance’s larger corporate members to meet their own targets. PepsiCo, for example, recently reported 50 per cent reduction in emissions from its potato farmers thanks to the Cool Farm Tool. This gave rise to identifying low impact fertilisers to on-farm energy efficiency.</td>
</tr>
<tr>
<td><strong>Stage</strong></td>
<td>3 projects have been completed that increased significantly the usability, scope and access of the tool. Building on that the tool has been able to grow in terms of usage, users, and visibility.</td>
</tr>
</tbody>
</table>

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16 Climate KIC. (December 2017). EIT Climate – KIC Priorities – Informing our 2018 Call for Proposals. EIT, a body of the European Union.
<table>
<thead>
<tr>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 15,000 farms footprints have been generated using the Cool Farm Tool from inception until 2017. The addition of 12 new members over the past 12 months cements the momentum building behind the Cool Farm Alliance and CASb</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Danone Sustainable Fruit Value Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact</td>
<td>EIT Climate-KIC partner INRA and Danone lead a consortium of academics and corporate to experiment the best structure per region or crops for the most efficient platform to foster the transfer of expertise and innovation from academics &amp; research to the farmers incentivised by the corporate. Work is focused on reducing GHG emissions from the production of strawberries and apples, Danone’s two most important fresh fruit ingredients. The project informs new supplier guidelines for climate-smart fruit production, pest resistance, genomics and soil management.</td>
</tr>
<tr>
<td>Stage</td>
<td>After a successful early stage project where it has been identified the need for systemic approach to drive change practices on perennial crops the larger project just started beginning of 2018.</td>
</tr>
<tr>
<td>Scale</td>
<td>It is a multi-stakeholder (corporate, farmers and research institute &amp; academic) and multi region project, because of the need to find the appropriate format for the platform.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Agrisource</th>
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<tbody>
<tr>
<td>Impact</td>
<td>Agrisource is an open innovation platform meant to link different actors of the agriculture sector such as the researchers, the innovators and the farmers. The platform is meant to provide different features, a cooperative area to discuss on common topic related to challenges for modern agriculture to become sustainable and a solution database to show case innovation.</td>
</tr>
<tr>
<td>Stage</td>
<td>The first iteration of the platform has been publicly launched in December 2017 at the yearly GACSA conference. The platform is under constant development and in 2018 the plan is to improve general ergonomy and user experience, the solution database and the collaborative features.</td>
</tr>
<tr>
<td>Scale</td>
<td>The platform intends to reach different stakeholders such researchers, innovators and farmers. The platform is currently marketed to CSA European network but can reach a wider audience worldwide through the FAO connection and GACSA network.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case Study</th>
<th>MOOC on CSA by University of Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact</td>
<td>Knowledge sharing, and public awareness are a big challenge for behavioural change in the agri-food sector from farmers to consumer. The access and capability to produce reliable and tailor-made information and education material is key in the respect.</td>
</tr>
<tr>
<td>Stage</td>
<td>Over the past 2 years the University of Reading has developed the MOOC in English that has been attended by more than 4000 persons in 2017. The MOOC has been since translated in French, Chinese and German to be launched in those languages end of 2018</td>
</tr>
<tr>
<td>Scale</td>
<td>The MOOC produced has targeted as audience the general public. The translation in the different languages can even expand that audience further. This shows the capacity of CSA community to produce tailor-made education materials.</td>
</tr>
</tbody>
</table>
3.4 Where should EIT Climate-KIC focus in the future and who should we work with?

To deliver Impact Goal 4, EIT Climate-KIC will:

- Link diverse actors across the agrifood value chain by creating a multi-stakeholder open innovation platform, growing local ecosystems and activating behavioral and dietary changes.
- Catalyze the application and adoption of CSA innovations via identification, assessment, validation and scaling of CSA solutions.
- Accelerate and de-risk CSA investments by creating data analytics and tools, developing public-private financing schemes and insurance mechanisms, and blending climate and agriculture finance.

Agriculture is a “complex” industry – it is a truly global and multi-stakeholder ecosystem with a wide range of processes, operations, and roles performed by diverse actors as food travels from “farm to fork” including:

- Farming and aquaculture
- Manufacturing agricultural inputs
- Food processing
- Non-food processing
- Marketing, wholesale and distribution
- Logistics, transportation, and warehousing
- Retail and foodservice
- Consumer cooking and food discovery
- Regulation
- Research and development
- Financial services

Given the interconnectedness of the supply chain, the food and agriculture sectors - agrifood - are increasingly being viewed as a single industry that spans the entire value chain (VC) from farm to fork. This holistic approach is needed to break the current silos and link the diverse actors along the agrifood VC. Therefore, the CSA Booster collaborates closely with its colleagues working on Impact Goal 5 on transforming food value chains.

To implement its strategy, allocate the budget efficiently and plan for sustainability, the CSA Booster divides its activities into two pillars:

**Pillar 1. Flagship capacity and ecosystem building**

- Ongoing capacity-building activities supporting the booster
- Building infrastructure and strategic “knowledge assets”
- Investment for the long term (potentially revenue generating)

Some of the “platform projects” in this pillar have been mentioned above such as the CSA Open Innovation Platform Agrisource, the CSA MOOC and development of regional CSA hubs.

**Pillar 2. Project portfolio**

- **Impact** (game changers), **scalability** and **sustainability** focused
- To explore and validate new concepts and business models
• To apply, demonstrate and co-create solutions in context
• To pilot products and services
• To generate revenue/return and support sustainability

For the project portfolio, we focus on three sub-themes:

1. Agtech (Agriculture technology) - technological innovations in
   - Soiltech (soil resilience, fertiliser, soil Carbon sequestration, etc.)
   - Precision and digital agriculture
   - Aquaculture

2. Agrifin (Agrifinance and insurance) - development and structuring of
   - Ag data & risk analytics and MEL tools
   - Risk-sharing/transfer insurance mechanisms
   - Blended and "climate-agrifinance" facilities

3. ITA (Innovation and Technical Assistance) - in
   - Value chain analysis (VCA)
   - Policy analysis and support
   - Business modelling and co-design

In terms of stakeholders, we see three groups that we need to work or engage with – our core group of CSAb partners active in our projects, “enabler” partners that will enable us to better achieve our goals, which includes non-C-KIC partners and collaborative partners such as FAO and FoodNexus, and finally demand-side partners such as farmers, consumers and other VC actors.

3.5 How will we monitor, evaluate and learn from our approach?

Purpose
EIT Climate-KIC is developing a comprehensive Monitoring, Evaluation and Leaning (MEL) Framework. The primary purpose is to institutionalise a continuous reflection, learning and adaptation process (i.e adaptive learning) on the relevance, effectiveness, efficiency, impact and sustainability of EIT Climate-KIC’s Theories of Change (ToC) and the associated logic models, interventions and their results and the use of evidence. The MEL Framework also promotes accountability by demonstrating a strong narrative about how resources and activities (grants, networking, knowledge, etc.) will lead to intended outcomes and impact goals.
Design Principles

The MEL Framework is developed based on EIT Climate-KIC’s ToC and its associated logic models and serves as a regular feedback loop to improve them. The framework focuses on delivering the essentials at a high standard (i.e. stay away from “nice-to-have”) while securing flexibility that allows rapid adjustments. It is both, comprehensive and flexible enough to embrace different objectives, approaches, indicators and system requirements set by EIT, DG EAC and other potential funders.

Monitoring

EIT Climate-KIC will monitor its inputs, activities and outputs on a regular basis. Beyond supporting operational monitoring measures (e.g. tracking financial flows, work load allocation and employee knowledge), the MEL team will:

a. develop a close-to-real-time portfolio dashboard of all our interventions. This will build in rapid feedback and learning loops from on-going activities to help EIT Climate-KIC make strategic decisions how to best allocate available resources and keep its portfolio closely aligned with the overall intended objectives;

b. conduct climate impact assessments on on-going interventions and develop an annual portfolio-level climate impact potential report in collaboration with Quantis (a EIT Climate-KIC partner). This will enhance investment decisions and provide ongoing learning opportunities on how to improve the positive climate impact of interventions;

c. monitor direct deliverables of its interventions to keep track of delivery against funder requirements (e.g. KPIs) and facilitate smooth annual funder reporting. No additional KPIs will be developed at the monitoring stage apart from fine tuning the existing ones.

Evaluation

EIT Climate-KIC will conduct periodic evaluation and learning activities along the entire impact pathway(s) of the ToC and logic model. While some of the evaluation and learning activities are closely tied into the strategy development process, the MEL team will focus on the delivering the following evaluation and learning activities every 2-3 years:

a. develop a framework to assess its maturity as a platform to catalyse systemic climate innovation. This will cover elements such as nature of our portfolio, knowledge on system innovation, degree of community engagement and reputation;

b. obtain an external evaluation of our operational delivery capacity and performance by conducting a comprehensive review of our funding streams, intervention formats, partner mix and so on.

c. assess our societal impact by 1) developing a multi annual climate impact assessment report that reviews our historical climate impact trends and identifies ways to improve our interventions’ positive

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17 Monitoring: regular systematic capture and examination of data on resources (e.g. funding and employees), interventions (e.g. summer schools and supporting innovation projects) and its results (e.g. change agents educated and new business models designed). By providing an indication of the progress and achievements of objectives, it supports on-going portfolio management and periodic reporting to funders.

Evaluation: the systematic and objective assessment of an on-going or completed intervention, its design, implementation and results. The aim is to determine the relevance and fulfilment of objectives, efficiency, effectiveness, impact and sustainability. An evaluation shall provide information that is credible and useful, enabling the incorporation of lessons learned into the decision– making process of all relevant stakeholders. 17

Learning: the process through which monitoring and evaluation findings are reviewed, communicated, synthesised and used for evidence uptake and to improve future design and implementation.
climate impact and 2) periodically conduct in-depth case studies on how our interventions have brought about change by addressing key “drivers of change” (finance, behaviours, skills, technology and policy)

Learning

We treat learning as a key purpose of both monitoring and evaluation. Therefore, we build learning components into every M&E activity. For instance, to support our monitoring activities, we will organise regular “action learning workshops” prior/ post to major company milestones (e.g. proposal intake) in order to extract immediately actionable learnings to continue to improve ourselves as an organisation. An effective MEL Framework also requires nurturing a culture that embraces failures and appreciates the opportunities for learning and ongoing improvement. The MEL team will focus on building joy and trust into its MEL activities. Together with the CSO, the MEL team will also ensure good leadership and management across the organisation to enable this.
Annex 1 Portfolio View Rationale

This annex provides supplementary information on the objectives, scope, design and next development steps of the portfolio views.

Why are we developing this?
The main objectives of developing a graphical overview of EIT Climate-KIC’s interventions is:

- to develop a ‘one version of the truth’ graphical representation of what EIT Climate-KIC does and facilitate active collaboration and learning;
- to capitalise on the relations and inter-connections between our interventions to develop a holistic approach to transform entire systems;
- to support information-driven decision making; and
- to improve transparency and accountability.

What is the Scope?
During the first development phase of the portfolio views, our priority was to focus on areas where we can rapidly develop tangible prototypes and collect feedback for the next improvement rounds. Therefore, over the past couple of month, we focused on our 2016 and 2017 portfolio where we had a reasonably well-structured dataset aligned with our current understanding of the theories of change.

Data included in current portfolio views are shown in the table below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Innovation</th>
<th>Entrepreneurship</th>
<th>Education</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>All (with exceptions described below)</td>
<td>n/a</td>
<td>PhD only</td>
<td>n/a</td>
</tr>
<tr>
<td>2017</td>
<td>Start-ups only</td>
<td>PhD only</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approximately 80% of all non-management related intervention are visible in the current portfolio views. Interventions not included in the visuals are:

- **2016 start-ups.** As you know, the Impact Goals is a new logic we have introduced in 2017/2018. At the time of data collection and cleaning, 2016 start-ups were not categorised into Impact Goals. The categorisation has been progressed in the meantime, so that we can include this in the next development round.

- **Non-start-up related entrepreneurship interventions.** We support many more interventions beyond start-ups, such as the Climate Launchpad. While these are extremely important to us, we prioritised providing you with a tangible graphic rather than taking more time to process the data.

- **Non-PhD related education interventions.** Similar to above, we are extremely proud of our master label, online education, executive education programmes. It was a matter of prioritisation at this stage.

It is also important to note that some “n/a” values appear in the visualisations. This could be because the data was missing (not collected at the time) or because it could not be validated. Our aim is to include all interventions into the portfolio view. Over the next couple of months, we will increase the scope and improve the data quality (see What’s Next).
What does the Portfolio View Show You?

Each visualisation shows the spread of funding for a single impact goal by visualising the interventions in this area. EIT Climate-KIC interventions often span across multiple impact goals; for this reason, all interventions that are categorised as a certain Impact Goal (whether primary, secondary, tertiary) are included in the relevant portfolio views. Interventions also often span across multiple Driving Forces; however, due to the nature of the visual design we are only highlighting one Driving Force (the one we considered as main contributor) for each intervention at this stage.

As a whole, the graphic is meant to answer a series of questions:

- Which types of interventions are receiving the most funding?
- Which types of stakeholders are most active?
- Where are funding and interventions distributed geographically?
- What are the most common driving forces across the entire impact goal?
- Who are the top stakeholders with the largest amount of funding? What kind or driving forces are they addressing?

These questions are answered through three key modules. On the left, you can see the breakdown of funding and stakeholder participation in three key areas (Intervention Type, Stakeholder Type, Geography).

- Grey bubbles show the total funding contributed for each category.
- The dots surrounding the bubbles show, for each type, how many partners contributed to this funding. Each dot is also coloured by the primary Driving Force associated. Please note that the number of dots are especially high whenever there is a Flagship involved. This is because Flagships tend to have numerous working streams under them which we treat separately.

In the top right, a group of bubbles shows how funding has been spent by each driving force.

- One bubble = One project
- More red bubbles mean a higher amount of interventions in the Information / Knowledge driving force

Finally, the bottom right module shows the top 10 stakeholders ranked by the total amount of funding they have contributed to projects within this impact goal.

- Bars show total funding per partner
- The end of each bar also shows the number of projects that this funding was contributed to
- Each bar is then divided into the driving force associated with the projects funded by that partner

As a set, all portfolio views share the same colours. This allows for comparisons to be drawn easily between two different Impact Goals, and to visually see how funding is spread across all EIT
Climate-KIC activity. The stacked bars in the bottom right are also scaled evenly across all 12 Impact Goals to allow for comparing top stakeholders between different Impact Goals.

At the current stage there are some interventions that have not been assigned a Driving Force. For example, start-ups are not shown as a colour because they do not have a driving force yet. These instances are represented by a shade of grey to represent “n/a” values. The same treatment has been applied for missing data.

What’s next?
Ultimately, we want to get to a place where we have an interactive and dynamic portfolio view that allows you to run analysis on needs basis. The content it covers will also go far beyond what is captured now.

Over the next couple of weeks, you will have an opportunity to provide feedback on what you liked/ disliked about the current version and ideas on how it could be improved. We will also make the backend dataset we used for the visualisation available so that you have an opportunity to review that as well.

Over the next 3 months, we will (1) integrate 2018 data (and data before 2016 if deemed valuable, (2) integrate other 2016 & 2017 data to extract more insights of our portfolio (e.g. KPIs) and (3) explore other analytical methods to better understand our portfolio (e.g. network analysis). Building on that, we will work on the back-end IT infrastructure that allows us to mine, clean, analyse and visualise our portfolio data semi-automatically. Moreover, we will also work on making the SPV more dynamic and interactive.