

Plan for the establishment of a **Delta Climate Center**

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Executive summary

The mission of the Delta Climate Center (DCC) is to develop and connect knowledge about the Zeeland delta for the benefit of the social issues surrounding the transitions to a sustainable, climate-resistant and prosperous delta. The goal is to realize innovative and impactful solutions for a future-proof delta through broad cooperation in the fields of research, education, valorization and business development. The DCC strengthens Vlissingen, Zeeland and the world.

Location is Vlissingen, from where the center is managed, the office is located and where colleagues form knowledge groups and work together. In addition, the entire Zeeland delta counts as the center's living lab and working area.

The research program focuses on regional transitions toward a sustainable, climate-resilient and prosperous delta. It asks what the role will be of 1) water and the coast; 2) food, energy and bio-resources, and 3) a circular handling of water, energy and bio-resources. The DCC will get off to a fast start from mid-2023 with a number of eye-catching iconic projects.

Based on the social challenges, partners combine fundamental scientific, applied scientific and development-oriented research. This is done in a process of co-creation through which valorization is woven into the research from the start and a bridge is built to create applications together with companies, social organizations and governments.

A broad educational agenda called **Sustainable Delta Transitions** provides Zeeland with a wide range of educational forms that will strengthen the labor market around climate transitions. New courses, innovative forms of collaboration and a program for lifelong development strengthen both the knowledge institutions and the labor market.

Continuous learning strengthens the link between MBO-HBO-WO, attracts young people to, and retains young people in Zeeland. DCC education projects engage students from different educational backgrounds jointly on climate issues, where their own skills combined with those of others gain clout.

Stimulating business development and startups in the areas of water, food and energy is among the objectives of the DCC. Co-creation with companies, organizations and governments in research, education and business development is part of the DCC's regular working method.

The DCC will take the form of a foundation to be established by the six knowledge institutions involved, with an Executive Board and a Board of Directors. The Executive Board consists of a scientific director and a business director. The Executive Board is accountable to the Board of Directors, which consists of representatives of each of the six institutions and an independent chairman. The DCC also has an advisory board with members from business, society and science.

The scope of the DCC as described in fiche 1c of Wind in the Sails was followed in full. This has resulted in a very ambitious program supported by all six partners. The DCC is expected to bring a number of 170 new students per year into the Zeeland education system. In addition, approximately 120 jobs will be created. Through research, education and intensive cooperation with businesses, organizations and governments, the DCC contributes long term to a safe, livable, future-proof and sustainable delta.

Funding is guaranteed for 10 years. During that period much attention should be paid to financial sustainability for the period thereafter. This should be achieved through externally funded research and educational projects, in-kind contributions from the institutions involved, and matching of partners from industry, organizations and government.

After approval of this plan by the Wind in the Sails Steering Committee, a start will be made on establishing the foundation, recruiting a decisive executive board and setting up development teams for research and education.

Mission and ambition Delta Climate Center

More than 500 million people live in deltas worldwide. That is about 7% of the world's population. Deltas are attractive and prosperous regions due to the presence of fertile land, abundant water resources and rich biodiversity. They are also high-risk areas: storm surges and floods have cost and continue to cost many lives. Globally, the livability and prosperity of deltas are under pressure from the cumulative effects of climate change and other human activities: rising sea levels, increasing flood risks, global warming, subsidence, pollution, loss of biodiversity, salinization and conflicting claims on the use of land and sea areas. The Zeeland Delta has a name to live up to in terms of taking on delta challenges. In particular, the protection of the Delta achieved after the 1953 storm surge has captured the imagination of the world.

The mission of the Delta Climate Center (DCC) is to develop and connect knowledge about the Zeeland delta for the benefit of the social issues surrounding the transitions to a sustainable, climate-resistant and prosperous delta. The goal is to realize innovative and impactful solutions for a future-proof delta through broad cooperation in the fields of research, education, valorization and business development. Particular attention is paid to the connection and interaction between the domains of water, food/bio-materials and energy.

The DCC strengthens Vlissingen, Zeeland and the world. Through collaboration with social stakeholders; from different knowledge perspectives: alpha, beta and gamma; scientific, practical and implementation-oriented. In the "living lab" of the Zeeland Delta, a regionally rooted, nationally and internationally appealing top institute will emerge.

The DCC not only promotes research and education that fits within current frameworks, but also, and specifically, pays attention to future solution directions that fit the seriousness, urgency and scale of the climate and sustainability issues. In addition, the DCC sees it as its task to critically analyze and assess existing developments and plans of public and private organizations from an independent position and to set them in motion. This task of critical reflection and subsequent action belongs to a leading knowledge institute that unites science and practice.

Knowledge Enhancement in Zeeland

In order to make a substantial contribution to the transition to a sustainable, climate-resistant and prosperous delta, forms of knowledge development, knowledge transfer, knowledge utilization and knowledge co-creation are needed, which are not yet available in the region. With the establishment of the DCC, UU and WUR as academic institutions will intensify cooperation with the knowledge partners already established in Zeeland, HZ/UAS, NIOZ, Scalda, WMR, UCR. The cooperation involves a unique combination of fundamental-scientific, applied-scientific and elaboration-oriented research and education. This broad range is reinforced by cooperation with a multitude of social partners, governments and companies. This contributes to the actual application of knowledge.

In this cooperation, we distinguish three aspects of knowledge enhancement:

- *Knowledge development.* Developing and implementing a research agenda aimed at achieving a sustainable delta transition, with a focus on the themes of water, energy, and food/bio-materials. This is being done at a scale and in the form of coalitions that the region has not seen before.
- *Knowledge transfer.* Developing an innovative continuous (MBO-HBO-WO) learning line in the field of sustainable delta transitions, which on the one hand enables a long learning path through the institutions in the region, and on the other hand enables students to learn about and contribute to climate transitions from different educational types. In addition, we strengthen the existing educational infrastructure with new MBO and HBO programs, which meet the labor market needs in Zeeland, and allow more students to choose Zeeland.
- *Knowledge utilization.* There is a cyclical relationship between knowledge development, transfer and utilization: by linking research and education to concrete issues of social partners, governments and companies, the urgency of the climate transition is emphasized for research and education, with knowledge institutions helping to focus the questions and provide innovative solutions.

The mission and goals of the DCC lead to specific research and education activities in collaboration with hands-on development of transition paths to a sustainable, climate resilient and prosperous delta (Figure 1). We define a *transition path* as an economic and/or societal development desired from sustainability and climate resilience in a particular domain, which is shaped through a joint effort of researchers, students, businesses, governments and civil society organizations. These transition paths can focus on parts of the complex problem field: the research themes below. The sub-themes are

studied through different disciplinary perspectives in mutual connection. The complexity of the assignments means that from the idea phase onward, research questions are defined and solutions are implemented in concert with all problem owners and users (companies, governments, social organizations and citizens) via various disciplinary approaches. This ultimately leads to action perspectives and practical applications that contribute greatly to the intended regional transitions.



Figure 1: The DCC's thinking and implementation framework (inspired by: Dutch Climate Research Initiative, 2022, p. 24).

Ownership and funding

The DCC will be set up as an independent and autonomous knowledge institute supported by the six founding members: HZ University of Applied Sciences (HZ), Royal Netherlands Institute for Sea Research (NIOZ), Scalda, Utrecht University (UU), University College Roosevelt (UCR) and Wageningen University & Research (WUR).

Financial resources, next to to additional co-financing to be raised, will come from the central government and the province of Zeeland for the first 10-year period and are part of the Wind in the Sails compensation package.

Methodology

Innovative solutions for a future-proof delta in water, food and energy are found in both research and education by applying a number of overlapping, largely innovative approaches:

- *Living lab.* The entire Zeeland delta is considered a living lab for researching, developing, and putting into practice innovative solutions to problems in delta areas in the context of climate change.
- *Transdisciplinary.* On the basis of societal challenges, partners combine fundamental scientific, applied scientific and development-oriented research. This is done in a process of co-creation through which valorization is woven into the research from the beginning.
- *Interdisciplinary.* Within the body of knowledge institutions, research and educational development takes place from a combined alpha, beta and gamma perspective. Alpha asks *why* the sustainable transitions are needed (learning from history, alternative value orientations and imagining the future), beta focuses on *understanding the physical processes* and how to intervene in them (in a natural science and technical sense using "big data") and gamma on *how* to organize this (the governance, law, behavior, support).
- *Linked educational approach.* A continuous learning pathway strengthens the MBO-HBO-WO link, attracts and retains young people for the region. It equips students with the knowledge and skills to actually put climate transition solutions into practice. DCC education projects engage students from different courses jointly on climate issues, where their own skills combined with those of others gain clout. This gives this education a bonus as labor market preparation. Through activating science projects in primary and secondary education, a *Young DCC* connects the entire education system in the region to the DCC and encourages young people to choose a relevant education.
- *Cyclical range.* Research, education, social impact and business development, based on *challenges*, are developed in conjunction, with the development of education necessarily having a broader scope than research. Developments in any chain link can raise new questions elsewhere in the chain. There is no top-down hierarchical relationship from theory to application, but a curious collaboration of multiple knowledge practices.

- *Thematic teams.* The professors, lecturers, practitioners and teacher-researchers to be funded from the DCC budget work together in thematic teams, which set up and implement and further develop (parts of) the research and education agenda, ensuring the connection between research, education, social impact and business development. The teams thus work as connectors between the core tasks of the DCC.
- *Open Science.* Finally, the DCC embraces the principles of *open science*. Collaboration among scientific disciplines and with societal stakeholders requires a culture of knowledge sharing. In this sense, *open science* will be standard practice in the research process.

Research at the DCC

The DCC's research program focuses on four broad topics that represent key societal challenges in the delta. These topics relate to water and security with nature-based solutions, the food-water-energy resources nexus, circularity and chain management. These topics are shown in Figure 2, linking three substantive themes to one cross-sectional theme, regional transitions. Further detailing of the research questions is described in Appendix 1. These themes provide focus to the research agenda, but specific questions can also be formulated more broadly in the domains of water, food and energy: the themes are thus guiding but not limiting.

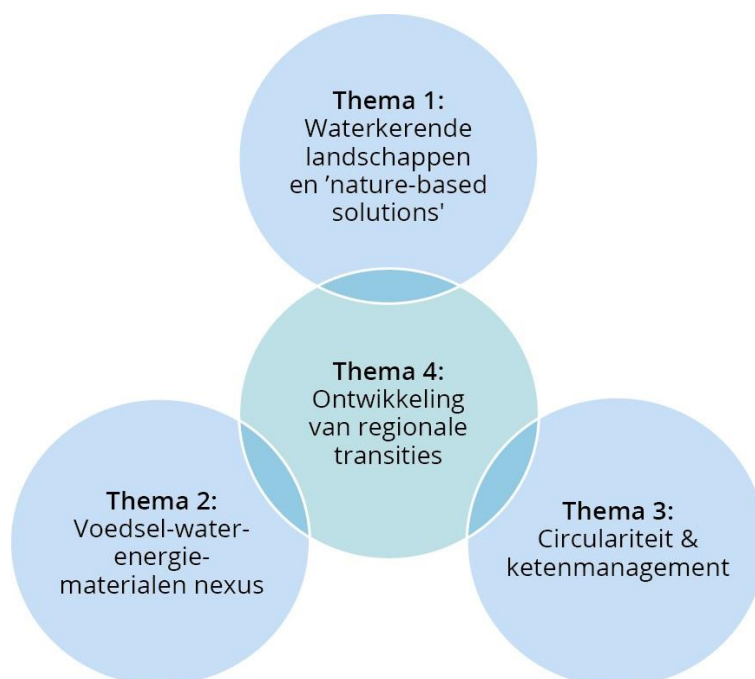


Figure 2: The DCC's research themes in context.

The DCC's four research themes:

- **Development of regional transitions is the intersecting theme of the DCC.** How can regional transitions toward a sustainable, climate resilient and prosperous delta be shaped and guided? This cross-sectional theme involves research and interventions aimed at understanding and organizing information, institutions and cultural aspects of transitions, with particular attention to the perspectives of data and technology, governance and law, art and culture.

- **Flood resilient landscapes.** Zeeland's Climate Adaptation Strategy shows a necessarily high level of ambition, with the goal of being climate-proof and water-robust by 2050, covering infrastructure, robust nature that can absorb climate extremes, and sustainable agriculture. The DCC is exploring how water and the coast can help us counter climate change and adapt to its effects. This includes research on new approaches to climate-resilient coastal defenses, especially using nature-based solutions.
- **Food-water-energy-materials nexus.** We conduct research on how we can use our food, energy and biobased resources, combat climate change and adapt to its consequences. This includes, for example, research on the transition from terrestrial animal to marine and plant protein, the transition to a circular and *bio-based economy* based on renewable materials, sustainable energy and the transition to guaranteed healthy and safe food. Research on *energy, and the transition to a zero-emission system* takes place at the interfaces of development of new energy systems, food and natural processes. New developments and research on impacts and implementation include marine energy such as the development of energy generation through tidal power and waves, as well as solar energy at sea, linked to food production and hydrogen. These often involve distribution issues: for example, much water is needed to generate energy (as feedstock for hydrogen and cooling power plants), energy is needed to clean and convert water into hydrogen, with water becoming increasingly scarce - including for the food chain.
- **Circularity & supply chain management.** This theme focuses on both food and non-food applications. It deals with the use of all substance streams (valorization) of bio-resources from the delta. It focuses on the entire chain from primary sector to processing industry, catering and retail and consumer goods industry. Circularity is a key principle here: in use of water, energy and nutrients. Through mitigation measures and attention to, for example, biodiversity, cultivation will be designed differently (more diverse, local, small-scale, using precision agriculture and nature-inclusive agriculture).

All research efforts contribute to improving the understanding and development of regional transitions toward a sustainable, climate-resilient and prosperous delta. In this context, we use the aforementioned concept of transition paths. Obviously, the climate and sustainability issues in Zeeland involve more themes than those mentioned above. The practorates in the MBO and lectureships in

the HBO are, due to their interconnectedness with education from the focus of the DCC, connected to a broader theme of food, energy and water. They play a key role for valorization and implementation of the DCC research themes in applied and elaboration-oriented projects with companies, organizations and governments. Moreover, the DCC can link other research themes relevant to a sustainable delta, provided that additional funding is found for them and that they fit the mission and goals of the DCC.

Co-creation of research

Research questions at the DCC are further specified in a process of co-creation with continuous involvement of stakeholders in the research, from the beginning, as well as in the implementation and in the final application and valorization. The DCC is independent, but works closely with a multitude of partners both in demand articulation (the formulation of the *challenges*) and in application and implementation of the developed concepts and business development. For example, the DCC seeks cooperation with parties in the region from the outset (Gebiedsoverleg Zuidwestelijke Delta, North Sea Port, Campus Zeeland, Economic Board, Cultural Board, VNO/NCW, FoodDelta Zeeland, Energy Port Zeeland, social partners, Impuls Zeeland, etc.) and links up with relevant agendas, such as the Southwest Delta area agenda. The DCC also forms an open network with other knowledge institutions: they are welcome to join in Vlissingen and participate in DCC projects. Thus, the DCC builds on, and strengthens relationships with Ghent University, TU Delft, EUR, Leiden University, Avans, HAS Green Academy and networks such as the Delta Platform, Knowledge Community Southwest Delta and the Climate Initiative Netherlands.

In the contacts with the Zeeland business community, the parties at the Kenniswerf - Dockwize, Impuls Zeeland and HZ Nexus - play a specific role. Dockwize and Impuls Zeeland have been working for years on a future-proof economic climate in Zeeland and the further development of Zeeland's ecosystem with (inter)national relations. They know the Zeeland business community, know what challenges are at play and know what new initiatives are emerging, within the region but often also in relation to other regions. They support companies with their innovation challenges, help startups, help SMEs grow, provide innovation financing, business development and have a directing role in various regional and national/international projects and programs. They can also involve companies and organizations currently still working outside of Zeeland. Market demand is central to the development of new initiatives. Connecting these organizations at an early stage ensures sufficient connection to the Zeeland ecosystem.

The intended *co-creation* takes place through matchmaking meetings of the DCC knowledge teams. There, based on the social issues surrounding climate change and based on the formulated themes, practical questions are raised, in

alignment with the implementation agendas of the various governments, with which the DCC teams of researchers and students will work, providing joint solutions. This always involves the entire chain, including the processing industry in the sectors relevant to Zeeland. Both the food chains and chains from agro to non-food applications, such as chemicals, materials and auxiliary materials, but also the industrial and port sector, companies dedicated to wind energy, etc.

The match-making events, organized in consultation with Dockwize, Impuls Zeeland, Delta Platform and Nexus, involve establishing:

- Relevant research questions that fit within the scope of the themes described above and could also lead to new practices, solutions, activities or policies.
- Opportunities to work together to develop research proposals for external funding, for example through Horizon Europe, the National Science Agenda or the National Growth Fund.
- Thinking about strategies how scientific and applied scientific research can lead to concrete practical applications through *action-oriented research* and *theories of change*.
- The way in which the DCC can initiate new research with co-funding from industry and governments and/or in-kind funding from civil society parties and the rules of the game that will apply (relationship co-funding and nature and degree of influence).
- The opportunities for cooperation in the field of education, in the form of *challenge-based learning*, practical projects, internships, *field labs*, graduation projects, etc., at all levels (MBO, HBO and WO).
- Where relevant, we link this to the policy agendas of line ministries, provinces, water boards, Staff Delta Commissioner and municipalities, making coordination, synergy and combining resources (human and financial) efficiently possible.

A quick start through three types of projects

We think it is very important to get a quick start on the DCC. We want to do that in three ways, which will be implemented in parallel.

- **Three iconic projects.** The intention is to start three so-called *icon projects*, representative of the profile of the DCC, immediately after the formal establishment of the DCC. These projects address themes 1, 2 and 3, each with connections to aspects of theme 4. For each of these three projects, interdisciplinary *knowledge teams* with representatives of the six founders will be assembled to develop the project in co-creation with "regional stakeholders" - businesses,

governments and civil society organizations. In this way, the necessary connections and embedding in the existing regional knowledge chain can be properly organized from the start. Each of these teams will receive a research budget of 2.0 million euros based on a detailed research proposal, outlining the main challenges - for scientific, applied scientific and elaboration-oriented research - as well as the relevance and potential impact for Zeeland and possibly other deltas. Each of the teams will be asked to arrange co-financing and in-kind funding from the Zeeland business community and/or from other societal parties (in the order of 10%, cash or in-kind). In addition, the knowledge institutions involved will make their own in-kind contribution. In this way, the total budget of each project can reach approximately 2.5 million euros. Each project has tangible social and economic spin-off.

- **Projects with substantial co-financing from public and private parties and a demand-oriented character.** A second initiative involves projects that are jointly initiated by public and/or private parties, with a strong demand-oriented character. The DCC will initiate new research with co-financing from industry and governments and/or in-kind funding from societal parties. 6M euro of DCC funding will be deployed and a 50% contribution from public and/or private partners will be requested, of which up to half will be 'in-kind'. Each of the research proposals submitted will be assessed by a committee of at least two internationally leading scientists on a number of criteria to be determined, including at least quality. All FFs and especially HZ, Scalda and WR will be able to play a prominent role in the projects financed in this way, for example through practical chairs, lectureships and students.
- **Preparation of research projects based on external funding.** As a third path to a quick start, the DCC encourages the creation of national and international consortia (with the participation of founders) that aim at attracting external research resources to fund research that touches the mission and research agenda of the DCC. In this way, the national and international standing of the DCC is enhanced. The DCC's role in this context involves providing *seed money* to bring competitive project proposals to fruition and, if possible, also providing co-funding where useful and required. An important condition is that the research in question is also relevant to and has an impact on the Zeeland delta. To this end, a *seed money* amount of €250,000 will be reserved for the first two years.

Quality assurance and peer review

The DCC develops and implements a system of quality assurance that meets (inter-)national scientific standards. The quality of basic, practice and elaboration-oriented research should meet the conditions for impact creation. Specifically, this means that the DCC organizes a transparent and independent review process for research proposals funded in whole or in part by the DCC.

Education - a linked education approach

A distinctive aspect of the DCC is that the integrated research agenda is flanked by a broad educational agenda for the region, which bears the name "**Sustainable delta transitions**". In this way, the transdisciplinary research on climate transitions is linked to new and existing education programs of the knowledge institutions involved. Thus, not only research is being developed and socially applied, but also a wide range of educational forms are being provided that will provide the region with well-trained (young) professionals, who will strengthen the labor market around climate transitions (Figure 3). In addition, a *lifelong development* program is being set up by Scalda and HZ, providing training and development to the labor market for later career stages as well.

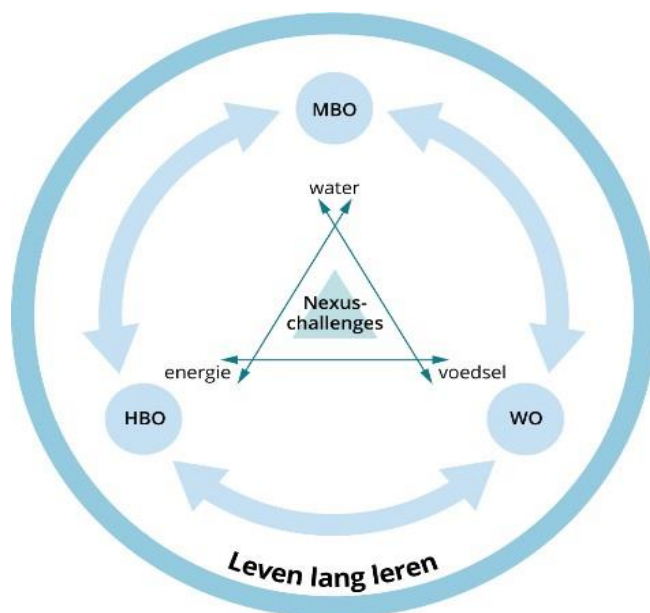


Figure 3: Lifelong development in Sustainable Delta Transitions.

Education established from the DCC serves multiple purposes:

- To best meet current and future labor market demand in relevant areas in Zeeland.
- Getting as many people as possible - young and old, from inside and outside Zeeland - interested in those courses, and training for those positions that are crucial for the needed sustainable delta transition.
- That train students to become professionals and equip them with the knowledge, attitudes and skills needed for these transitions (change agency, entrepreneurship,

Economic, social impact and business development

In the context of social impact, aspects such as safety, livability, health and support for sustainability and climate resilience should be considered. These impacts are often more difficult to substantiate quantitatively, but no less important. DCC projects have noticeable social impact where the sustainable transition of the delta is concerned. DCC projects are always transdisciplinary, combining education, teaching, social impact and business development. They have noticeable social impact where the sustainable transition of the delta is concerned, but also lead to larger student numbers, new residents of Vlissingen and more SMEs including startups.

Where the *impact* of the DCC is concerned, this is primarily through education. This happens through the MBO and HBO provide the relationship with the region and the work field (companies, governments, organizations) like no other. They ensure, regardless of the further success of the DCC, the achievement of the socio-economic goals and the fulfillment of the labor market demand and thus the rapid relevance of the DCC in the region. UCR has a rich tradition of working with community partners in governance, arts and culture and will build on this community-engaged learning for DCC as well.

Research projects funded by the DCC will not only result in positive social impacts in a direct sense, but the additional higher educated people associated with the DCC are also expected to play an important role in the social and civic life of Zeeland. Social impact also includes attracting more students as a result of investment in new courses, and involving students in research projects funded by the DCC. The DCC seeks cooperation with governments, such as municipalities, the province, water boards and the Southwest Delta.

Business development is a separate knowledge utilization activity when cash or in-kind co-financing is provided by industry for this purpose. The DCC will adopt the rule that a minimum of 25% co-funding is required for business participation in research projects. There is no restriction in advance on the type of companies that can be involved in DCC research, although the scope of the research agenda and the process of co-creation will guide this.

In terms of economic impact, the main focus is on increasing economic earning power: technological innovations, new businesses/start-ups and employment. In its contacts with the Zeeland business community, Dockwize plays a special role. It supports companies with their innovation challenges and helps with

setting up startups. The founders of the DCC also see added value in seeking to involve the business-development and valorization-oriented parts of UU, WUR and NIOZ in business development and valorization. The possibilities for this are being explored. In particular, one option is for UU, WUR and NIOZ to appoint persons within Zeeland who will be responsible for valorization and business development in relation to DCC activities. It is important that these people are anchored in Zeeland (based in Zeeland or active in Zeeland for at least half of their time), and at the same time are part of the valorization/business development communities of one or more FF (appointment there, part of a team for sparring and management in the field).

Government participation in research projects to be funded by the DCC is also subject to a 10% co-funding requirement (cash or in-kind).

Participation of private non-profit organizations in research projects is subject to a lower co-funding requirement of 10%, which can be either cash or in-kind. In special cases, this co-funding obligation may be removed if the participating social actors have insufficient funds to meet the obligation.

Location

The Delta Climate community requires an environment that invites encounters and collaboration and allows the application of innovative forms of work in the areas of education, research and impact. The DCC will therefore be located in Vlissingen, at the Kenniswerf. Here the DCC is not only a space for administrators, but above all a space for delta pioneers, where creative researchers (from junior to senior), teachers, students, partners, business developers, impact coordinators and representatives of public and private organizations meet and collaborate. One possibility for this is the "HZ tower" in Vlissingen.

The DCC staff and researchers will settle in and around Vlissingen. In addition, in consultation with the Vlissingen municipalities, it will be necessary to provide temporary housing for the students and guest researchers coming to the DCC for 10 weeks or six months, preferably also at the Kenniswerf.

Governance of the foundation

Management and Board of Directors

The DCC will take the form of a foundation to be established by the six parties involved, with a Executive Board and a Board of Directors. The Executive Board will consist of a scientific director (responsible for the content of research and education projects and activities related to generating economic and social impact) and a business director (responsible for financial and organizational matters).

A Board of Directors oversees the work of the Executive Board and consists of representatives from each of the 6 institutions and an independent chairman. Decisions on important issues to be specified are made unanimously. Each institution appoints one member of the Board of Directors and together they appoint the independent chairman on the basis of unanimity. The members of the Executive Board are elected and appointed by the Board of Directors. The Board of Directors of the foundation is ultimately responsible for the programming of all activities to be undertaken by the DCC, their decision-making and the organization of progress and quality control. The scope of the duties of the Board members is estimated at 0.05 FTE. Since the members come from the six participating organizations, or participate on their behalf, they are not remunerated separately. The members of the Board of Directors have sufficient content expertise in the field of work of the DCC, have connecting qualities and have an excellent network of relations that is important for the work of the DCC.

The Executive Board has a policy-preparing and -executing role and is accountable to the Board of Directors. The relationship between the Board and Management is detailed in the Foundation Act and a resulting procurement regulation.

The two members of the Executive Board will have an appointment of 0.8 FTE each at the start; the appointment size will be evaluated regularly. The scientific director has the profile of an excellent scientist at professor level, with demonstrable affinity with HBO and MBO, with the field, and with excellent connecting qualities and experience with the relationship between knowledge production and knowledge utilization. The scientific director is the figurehead of the DCC. The business director has significant experience in financial and organizational management at large public organizations. Open recruitment will be initiated for both positions. Together, the directors must be able to further expand the DCC and give it a structural place in the regional and national knowledge landscape. A point for attention here is that it must be clear in the short term how support and advice will be organized for the Executive Board and the Board of Directors regarding the approval of project proposals (and associated budgets) submitted by, among other things, the knowledge teams, - starting with the iconic projects.

DCC Office

The Executive Board and Board of Directors are supported by a staff of limited size (secretarial support, and support in the areas of communications, programming and regional and national networking). Together they form the DCC office. Governance must be efficient and decisive, and the costs involved must certainly not exceed 10% of the DCC's disposable budget. This includes housing costs. The DCC itself has no employees. Management and board members are also not employed by the DCC. The DCC hires board members, researchers and teachers from the participating organizations. How this is done will be worked out in a cooperation agreement.

DCC Advisory Council

The DCC has one Advisory Board, which includes civil society and scientific parties with an interest in the foundation's activities. These include: Dockwize, Impuls Zeeland, Economic Board Zeeland, Province of Zeeland, Zeeuwse Milieufederatie, Stichting het Zeeuws Landschap, Vlissingen municipality, etc.. Other relevant knowledge institutions, that collaborate in research projects, can also be represented in this advisory body, such as Deltares, TNO and Rijkswaterstaat, TU Delft, UGent etc.. The DCC Advisory Board can provide solicited and unsolicited advice to the Executive Board and the Board of Directors on all matters relating to the DCC. The DCC Advisory Council has an independent chairman. The precise role and composition of the council will be detailed in the founding act.

Diversity and inclusiveness

The DCC is committed to diversity and inclusiveness in its approach, including gender, culture and age dimensions. We ensure that diversity is sought in the recruitment and selection of board members, directors, researchers and faculty for this program, and an appropriate balance and representation of all relevant stakeholders is sought in the selection of stakeholders and experts for activities organized by the DCC. We also ensure that, to the extent possible, the views of all relevant social groups are equally considered when studying and developing transition pathways to contribute to a sustainable, climate resilient and prosperous delta. Far-reaching social and economic transitions involve different benefits and burdens, and these should not be overlooked.

Quality assurance

Oversight of the proper use of grant funds is done from audit chamber oversight and auditing. Quality assurance on content is done through a system of peer

review, as outlined in Section 3.5. Quality assurance on content applies to both the project level and the program level.

Budget and business case

Financing modalities

The DCC uses its financial resources to subsidize activities related to research, education and the generation of social and economic impact, in the context of the foundation's mission and goals. The DCC distinguishes five funding modalities that are indicated below. In doing so, the DCC is primarily a booster and connector of activities carried out under the responsibility or umbrella of the DCC by its institutions and partners.

- *The DCC as principal for research.* The DCC acts as commissioner of research based on the research agenda presented. That research may be 100% funded by the DCC, or it may be subject to a co-funding requirement (depending on type of research and collaboration with governments, companies, civil society organizations, etc., see Section 7.4). The DCC cannot be a competitor of, or alternative to, its institutions or partners.
- *The DCC as cofinancier of research.* The DCC may decide to co-finance projects of the six knowledge institutions involved, in the event that there is a co-financing obligation from the grant or sub-optimal pricing (NWO, Horizon Europe). This concerns only projects with multiple knowledge institutions, where the contribution of the DCC makes a clear additional impact for the Zeeland region, in line with the mission and goals of the DCC. Co-financing is thereby capped in order to achieve the impact necessary for the region. The DCC can also cover the development costs of these types of projects.
- *The DCC as a funder of professors, lecturers, practitioners and teacher-researchers.* The DCC will fund a limited number of positions for professors, lecturers and practitioners and teacher-researchers who will play a key role in the development and implementation of the research and education agenda. These will be part-time positions for a period of 8 years, so that during much of the grant period their contributions can be benefited and they can help shape and give substance to the profile of the DCC.
- *The DCC as a funder of educational development projects.* The DCC funds both the development of new courses at HZ and Scalda and the development and implementation of the continuous learning line in the field of *Sustainable Delta Transitions*. As far as the new courses at HZ and Scalda are concerned, this only involves financing the development process. After that, the courses will drop into the regular

education funding. As far as the continuous learning line is concerned, this involves changes needed in existing courses, development of new courses, development of *challenge-based* student projects, development of extra curricular activities and funding for temporary residence of WO students in Zeeland.

- *The DCC as a funder of supervision costs of undergraduate and graduate students deployed in research projects.* These supervision costs can be reimbursed by the DCC to the extent that they cannot be reimbursed from regular education funding (for example, in the case of NIOZ and WR) or that reimbursement is demonstrably insufficient.

The DCC must not become a competitor of the six parties cooperating in the DCC. Therefore, the DCC must not be a contractor and acquisition can only take place in the name of, and in line with the preconditions of, the cooperating parties.

Pricing

In principle, the DCC funds research activities on the basis of IKS pricing. This does justice to the differences in fee structures between the knowledge institutions involved. By contrast, investments in education are budgeted at cost and indexed. The guidance of undergraduate and graduate students (for DCC-related internships and theses) is paid from the education budget at cost price, but with the precondition that the spending of these funds can only be in agreement with and focused on the DCC research-impact chain. It is also true that student support can only be funded if it is not possible through regular education funding.

DCC budget and budget distribution

A budget of **88.4 million euros** is available for the DCC for a period of 10 years. That budget consists of a national government contribution of €68.4 million (on which VAT must be paid) and a contribution from the province of Zeeland of €20 million. In addition, the knowledge institutions involved will make in-kind contributions. Co-financing from industry is also to be expected, but the extent of this is obviously uncertain. More on that later.

The six knowledge institutions involved have agreed on a distribution of the budget that does justice to their future role in the DCC. Table 1 shows the distribution of the available budget of €88.4 million. The following assumptions were used in the budget distribution.

A substantial portion of the budget is spent on research. The research agenda, as presented above, is leading in this regard. Given their intended role in the DCC, the academic institutions (UU, WUR and NIOZ) will spend most of their budgets on research, while the other more education-oriented institutions (HZ, Scalda and UCR) will also spend a significant portion of their budgets on educational innovation.

Available funding for research can also be used, to a limited extent, for investment in small-scale research facilities if they are needed to carry out research and are not currently available in Zeeland. This is to be determined on a project-by-project basis. Otherwise, DCC researchers will make as much use as possible of facilities already existing in Zeeland (JRCZ, other labs, pilot plants, teaching spaces, etc.). Only if the necessary facilities are not present or available, facilities elsewhere may be used. Use of existing facilities in Zeeland is reimbursed from the DCC budget and is part of a project budget. Rates for rental and use of facilities will be mutually agreed upon.

Educational renewal takes place in two ways, as explained above. First, it involves investments in new courses and specializations (and their further development) at HZ and Scalda. Second, investments are being made in the development of a continuous learning line. Related activities include both the development of a continuous learning line and the supervision of students who can be used in research projects, as well as the development of additional curricular activities and the provision of training and courses for professionals in the region and beyond. Both types of investments have been visualized separately.

In the context of the continuous learning line, it is planned to bring students from UU and WUR to Zeeland for part of their training. The accommodation costs of these students will be reimbursed by the DCC. This concerns about 40-50 students per year, for a period of 3-6 months. These costs have been taken into account in the education budget for both institutions (€50,000 per year).

Generating economic and societal impact is an inherent part of all research activities. At least 10% of the total research budget is spent on activities aimed at knowledge utilization. The exact budget per project depends on the type of research, the social target groups associated with this research (public or private organizations) and the specific knowledge utilization ambitions and opportunities.

The new knowledge generated with DCC funds should lead not only to the strengthening of existing companies (through business development) but also to new activity in the region, for example in the form of startups. It is also important to involve other knowledge parties as partners in research activities. Examples include Deltares, TUD, TUE, TNO, OnePlanet, etc.

	Training		Practorates, Lectureship s, Professors	Research & Valorization projects	Organizatio n	TOTAL	Percent
	Initial	Continuous Learning line					
WUR		0,80	2,50	13,72		17,02	19,26
UU		0,80	2,50	13,72		17,02	19,26
NIOZ		0,30		7,78		8,08	9,14
HZ	4,00	1,00	3,20	8,62		16,82	19,02
Scalda	0,45	2,25	4,80	3,22		10,72	12,13
UCR		1,90		2,06		3,96	4,48
Third Party				3,21		3,21	3,64
Profiling				1,82		1,82	2,05
DCC office					9,55	9,55	10,80
Cost quartermaster phase					0,20	0,20	0,23
TOTAL	4,45	7,05	13,00	54,15	9,75	88,40	100

Table 1: Distribution of the DCC budget (amounts in millions of euros). A small portion of the DCC's activities are VAT taxed.

Finally, a small part of the budget is spent on further profiling and building up the DCC as a knowledge center, also with a view to the future. On the basis of that budget, for example, exploratory studies can be carried out (on organization and financing in the longer term), advice can be obtained, national and international branding can be organized and 'position papers' can be written by leading researchers.

DCC resources are used for activities in and for the Zeeland region. Only exceptionally can this principle be deviated from, in case of clear necessity and with a positive contribution to the profile and positioning of the DCC.

No institution can decide independently on the use of resources. It can only do so in cooperation with other institutions and with the approval of the full Board of Directors (see Governance chapter), where considerations as expressed under mission, goals and distinctiveness are leading.

Investment rhythm research

Investment in research occurs in 4 rounds: in year 1, in year 2, in year 4 and in year 6. The idea is to start immediately, soon after the formal establishment of the DCC, with three iconic projects that are representative of the profile and modus operandi of the DCC. It is precisely in these iconic projects that the uniqueness of the DCC should strongly emerge and everyone's role, especially when it is not (yet) obvious, should be elaborated. The projects are initiated from themes 1, 2 and 3 and each has connections to theme 4 (see Figure 2). For each of these three projects, teams are assembled with representatives from the six knowledge institutions involved. In this way, the necessary connections in the knowledge chain are well organized from the start. It is essential that these teams be interdisciplinary with attention to scientific questions of alpha, beta and gamma nature. A total of 6 million euros is available for this first round.

In three rounds - in year 2, year 4 and year 6 - the remaining funds for research are distributed and in equal parts. This means that about 11 million euros are available for each round. An investment round is always preceded by an investment plan, partially based on the knowledge needs of companies, governments and civil society organizations. It is not a requirement that every research theme be given equal attention.

Each investment round has a maximum lead time of four years. The last round of investment in year 6 offers the last chance to employ PhDs in research (since they are usually appointed for four years and need that time to produce a dissertation). This means that after year 6, most of the DCC funds have already been earmarked.

Education investment rhythm

The elements of the continuous learning line will be started from 2023. This initially involves development costs, from 2024 this will result in initial education. The start-up of new courses is an intensive process of years, a first indication of phasing to be planned is indicated in the appendices of HZ and Scalda on education. In the period from January to July 2023, precise time and investment plans will be developed for the new courses.

Co-funding of research

Research funded by the DCC requires co-funding. The following principles apply:

Industry participation in research projects is subject to the rule of a minimum of 25% co-financing (in-cash and/or in-kind).

Participation of private nonprofit organizations in research projects is subject to a lower co-funding requirement of 10%, which can be either cash or in-kind. In special cases, this co-funding obligation may be removed if the participating social actors have insufficient funds to meet the obligation.

Government participation in research projects to be funded by the DCC is subject to a 10% co-funding requirement (in-cash or in-kind).

The co-financing can be used for research activities, for experiments with practical applications and/or for generating social and economic impact. Depending on the destination of the co-financing, it can be determined which knowledge institutions involved can make use of the additional resources.

We expect that half of the research budget can be spent on research relevant to industry. The other half of the budget is expected to be relevant to governments and civil society organizations. Given the aforementioned co-funding rules, this results in an additional budget of approximately €7 million.

In-kind contributions from the six knowledge institutions

The six knowledge institutions involved will make in-kind contributions in the form of supervision of students, PhDs, post docs, PDEngs, professional doctorates and other researchers. A conservative estimate is that this in-kind contribution will amount to a maximum of 4 million euros (roughly 10% of the research budget). The in-kind contribution of the knowledge institutions involved will be further determined and specified in a subsequent phase.

DCC multiplier

The DCC also aims to act as a multiplier. With limited pre-funding or co-funding, a multitude of new grant resources can hopefully be tapped (NWA, Horizon Europe, National Growth Fund, regional funds, etc.). It should be kept in mind that these funds often have to be acquired in competition and success is not guaranteed. We expect that over a 10-year period at least 10 million euros in additional research funds can be acquired for projects involving the six knowledge institutions (in various combinations). Obviously, the ambition is higher. We hope to arrive at an amount of around 20 million euros.

Total investment size DCC

Table 2 below shows the budget of the DCC that can be used for research, education and impact activities, i.e. excluding the costs of the DCC office and including VAT.

Available budget for DCC activities.	Amount
Budget based on state and provincial contributions	78.6
Expected industry co-financing	5.0
Expected co-financing from governments and civil society organizations	2.0
In-kind contributions from knowledge institutions involved	4.0
DCC - multiplier	10.0
Expected investment size	99.6

Table 2: Total DCC investment size (excluding DCC organization costs, including VAT; amounts in millions of euros).

Sustaining the DCC in the long term

Conditions for perpetuation

Essential for the long-term perspective is that the distinctive chain approach and cooperation also works distinctively for all knowledge institutions and for the Zeeland region in particular. This must be demonstrated by the fact that distinctive experts have been attracted who can and want to work permanently in the region. Resources must remain available in the future to continue to shape the DCC collaboration in a sustainable way.

The first two points can be assessed well before the end of the DCC grant period (10 years). The third point is obviously more complicated. A commitment for structural funding and commitment from governments beyond the initial 10-year period cannot be made at this time. However, neither can it wait until the end of the grant period. Therefore, a mid-term evaluation in year 5 is necessary to determine how to continue beyond the end of the grant period and what financial options are available to do so, including the possibility of doing things very differently if necessary to enable continuation beyond 10 years. This also includes that, if it proves necessary, it should be possible to wind down the DCC after 10 years and dissolve the foundation.

Periodic monitoring at the program level

At program level, periodic reviews are conducted by national and international experts. A first interim review is organized 4 years after the official start of the DCC in accordance with assessment principles from the *Strategy Evaluation Protocol (SEP) 2021- 2027* that VSNU, NWO and KNAW apply to all publicly funded research. This applies to the broad spectrum of research conducted by the DCC. Results of this review can be used to adjust the research agenda and adjust the strategy, after approval by the Board of Governors. A second program review is organized 9 years after the establishment of the DCC. This review will be conducted on the basis of the SEP then in force and will also focus on drawing lessons from the past, which are important for the continuity of the DCC after 10 years.

Quality assurance also means that the research program and research projects are regularly benchmarked against the *state-of-the-art* of science and the societal agenda. Relevant insights and developments should be discussed with the research community, social parties and socio-economic knowledge networks. This can be organized in various ways, for example in the form of symposia, workshops, lectures, debates, brainstorming meetings, experimentation sessions, etc.

Naturally, the Scientific and Social Advisory Council is also part of the system of quality assurance and reflection. This council advises the Executive Board and the Board of Directors, solicited and unsolicited, on the scientific and social course of the DCC, in the context of the established profile and related ambitions.

The principal for the mid-term review and the final review is the Board of Directors. The Board ensures that the review is conducted in a transparent and independent manner. The Executive Board and the DCC office provide administrative and organizational support.

DCC plan in the context of Sheet 1C

The scope of the DCC as described in fiche 1c has been followed in full. We have opted for an approach in which research by all partners involved, of a fundamental, application-oriented as well as elaboration-oriented nature, will provide a long-term strengthening of the knowledge infrastructure. In the deployment of resources, the emphasis has been on "people" rather than facilities. We are also consistent in these further choices with what we have previously made known. Indeed, the partners articulated from the outset that the draft business case prepared in 2020 needed to be reviewed for feasible implementation.

In terms of research and education, these choices have resulted in a very ambitious program supported by all six partners. As far as the number of new programs is concerned, the plan is more modest than formulated in 1c, but at the same time ambitious, innovative and realistic. As far as the location is concerned, a physically recognizable headquarters in Vlissingen has been chosen, which is also the intellectual center of activities. From here, staff and students will fan out to living labs and other facilities throughout the region.

Yields and indicators

1. Socio-economic impact

The number of students from a total of 8 new programs to be realized will be around 130 per year. Annually 40 master students from UU and WUR, and possibly from other institutions, will come to do project work in the province. This brings the total number of additional students per year in the region to an estimated 170.

2. Impact on business climate

The intended impact on the business climate remains undiminished. We offer a unique integrated program and expect it to have a high profile on the business climate. Through research, education and intensive cooperation with business, organizations and governments, the DCC contributes in the long term to a safe, livable, future-proof and sustainable delta. The region can thus profile itself as a "frontrunner" with an integrated, society-wide approach to the challenges of climate transitions.

3. Impact employment

Given the amount available for investment in research and education, we estimate that about 100-120 new (but temporary) jobs could be created.

The principled fit within State policy is guaranteed thematically in the areas indicated in Sheet 1c.

Follow-up actions and planning to July 2023

After formal adoption of this plan by the boards of the six knowledge institutions involved and the Wind in the Sails Steering Committee, various aspects need to be worked out. In part, this can already begin after December 1, 2022. It is expected that the DCC can start on July 1, 2023 at the latest.

Follow-up actions regarding foundation governance:

- **Foundation deed and cooperation agreement.** The cooperation between the six knowledge institutions involved is laid down in a cooperation agreement. Subsequently, the six knowledge institutions establish a foundation, the *Delta Climate Center Zeeland Foundation*, as a legal entity. The foundation deed follows the approval of the cooperation agreement. In that agreement (or in a related but separate document), in addition to the general principles of cooperation, the financial rules of the game are laid down, including use of each other's facilities and a specification of the in-kind contributions expected from the individual knowledge institutions. Quality assurance policies are also specified in the cooperation agreement. Finally, the cooperation agreement specifies that the academic parties, being UU, WUR, NIOZ and UCR, have no liability and responsibility regarding the initial investments in new courses at HZ and Scalda (Stream 1). A team with representatives of all institutions involved will be formed as soon as possible to draft the cooperation agreement and the foundation deed.
- **Grant decisions.** The foundation will use a grant provided by the Ministry of OCW and a grant from the Province of Zeeland. Both grant decisions must be well coordinated and available no later than 1 July 2023 when the foundation is formally established and the DCC starts. The responsibility for the creation of both grant decisions lies with the implementation director.
- **Elaboration of the business plan.** The business plan for the DCC, as outlined in this plan, needs further elaboration. This needs to be taken up by financial experts and/or business developers associated with the six institutions involved. In any case, clarity must be obtained about the VAT payment. It is also important to check for unauthorized state aid. The budget of the DCC office must also be worked out in more detail as well as the investment rhythm for the 10-year period. Finally, the in-kind contribution of the six institutions must be determined and specified.

- **Appointment of members of the Executive Board and members of the Board of Directors.** The proposal is to appoint a two-member Executive Board consisting of a scientific director and a business director. Open recruitment will take place. The members of the Executive Board do represent or on behalf of the six institutions involved, with the exception of the independent chairman. The six institutions involved jointly draw up a profile for both board members and arrange a procedure for selection and appointment. They shall also consult on the selection of members of the Board of Directors and elect an independent chairman.
- **Recruiting staff for the DCC Office.** Once the members of the Executive Board and members of the Board of Directors are appointed, the recruitment of employees for the DCC office can begin. Preferably, these employees come from the participating institutions. They will be seconded to the DCC Bureau from these institutions.
- **Appointment of professors, lecturers and practitioners.** In accordance with Sheet 1C, the DCC budget will finance 4 professors (2 WUR and 2 UU), 4 lectureships (HZ) and 4 practorates (Scalda). Together, these individuals should represent the wide range of expertise needed to realize the mission and goals of the DCC. Since these key persons will work together in teams, they must have complementary areas of expertise. The six knowledge institutions involved will consult on the composition of these teams as soon as possible.

Professors funded with DCC funds may be affiliated with UU or WUR. Possible partial appointments through HZ, NIOZ and/or UCR are possible. In consultation, UU and WUR will further determine which professors will be active in the Zeeland region and on which topics. They will soon come up with a proposal as to what is needed for this, based on the ambition to be permanently active in the region, provided long-term funding allows. Instead of directly appointing professors, the choice can also be made to appoint UHDs who are promised a professorial position.

Lecturers and practitioners are appointed at HZ and Scalda, respectively. Both knowledge institutions will come up with their own proposal as to which appointments are envisioned, taking into account the ambition to have these individuals work together in teams with complementary areas of expertise.

Development of the research and education agenda:

- **Research Development Team.** A team of representatives from the six knowledge institutions will be formed to develop the main elements of the research agenda. The assignment involves: (1) selecting three iconic projects that can start immediately after the formal establishment of the DCC; (2) developing a plan for the organization of match-making meetings with companies, governments and civil society organizations (and also discussing this approach with the organizations concerned in order to garner as much interest and support as possible); (3) drawing up an outline plan for participation in national and/or international calls for research and impact, including an exploration of suitable partners; this will also include a proposal for how the development of new research proposals through the DCC can be financially supported.
- **Development team for the continuous learning line mbo-hbo-wo.** A development team of representatives of the six knowledge institutions will be formed to draw up a plan of approach for the development of a continuous learning line MBO-VBO-WO in the field of Sustainable Delta Transitions. The emphasis is on identifying the main opportunities for alignment and cooperation. This continuous learning line will be modular and linked as much as possible to the themes from the research agenda. The plan should also address the organization of joint projects for students in the form of *challenges* and the development of extra curricular activities. In time, it will also need to explore how students can be used in DCC-funded research projects. However, this can only be done after the first projects have started.