

Talent and collaboration, PLEN Strategy 2025



Contents

0. Summary of the departments goals	3
Goal A. Strengthen coherence and develop strong research and teaching environments	3
Goal B. Increase visibility and impact	5
Goal C. Recruit, retain and develop talented staff and students	7
Goal D. Improve governance and administrative support	8
1. Attracting, developing and retaining academic talent	9
PLEN will promote cutting-edge infrastructures.	9
PLEN wants to use internationally recognizable career positions, attractive on-boarding packages and research environments.....	10
PLEN will increase focus on equality and diversity to ensure that intellectual creativity and talent can flourish.....	10
PLEN will work to enhance staff and student mobility.	11
2. Education with closer ties to research and practice	12
PLEN wants to strengthen the linkage between research and teaching – and vice versa.....	12
PLEN wants to promote challenging learning environments for students and employees.	14
PLEN will further develop and implement digitalization in teaching.	15
PLEN will attract and graduate talented students who possess solid academic skills, an understanding of practice and the ability to collaborate across fields.....	16
PLEN will focus on carrier development in collaboration with external national and international partners.	17
3. Collaboration and societal commitment – nationally and globally.....	18
PLEN will promote our scientific position internationally.....	18
PLEN wants to contribute to resolving the major global societal challenges.	18
PLEN will be a driving actor in developing green solutions.....	19
PLEN will develop lateral themes to create collaborative environments within PLEN and across UCPH Departments.....	20
PLEN will strengthen private and public research partnerships in Denmark and globally.	20
4. One unified and focused university.....	22
PLEN will continuously have focus on the career for young scientists	22
PLEN will integrate and include all competences in planning research and teaching	22
PLEN will integrate the lateral themes to direct the development of the Department, both for teaching, funding initiatives and when attracting new employees.	23
PLEN wants to optimize the high level of external funding.	24
5. Process and employer engagement	25

0. Summary of the departments goals

Goal A. Strengthen coherence and develop strong research and teaching environments

PLEN wants to further develop the scientific areas in the core of the three main scientific fields (Biotechnology, Agriculture and Environment) and use the synergy between these fields to develop new strategic research areas and optimise the teaching portfolio. PLEN wants to be an active partner in supporting the needed green transition in compliance with and beyond UN sustainable development goals (SDG) by providing the necessary solutions in cross disciplinary collaborations. New strategic research areas in the green transition together with the consolidation and development of the three main scientific fields will ensure coherency at the Department. This will likewise support development of educations of candidates for the future necessary green solutions and keep the close link between research and teaching.

The profiles of three scientific fields at PLEN is recognised inside and outside the Department and provide an exceptional opportunity for strategic development of research and teaching. This will give new opportunities for new research areas to arise within and across these scientific fields. As the teaching is research based, it will influence the teaching portfolio and give the candidates skills and competences to provide solutions for the green transition. The education landscape and teaching portfolio need to be agile to follow the societal need for candidates especially for the green transition. There is need for strategic development and decisions to optimise the education landscape e.g. even to simplify and have recognisable tracks from bachelor to master level. The challenge here will be to create available time and financial flexibility to develop current as well as integrate new research areas.

The aim is to continue development of the scientific excellences of the research groups and use lateral themes and UCPH Green Solutions Centre for future development of new and cross-disciplinary research areas. This will give new opportunities for funding with unique network and synergy, which will help to consolidate current research groups and be the basis for new research groups. When developing new research areas, it will be taken into consideration how these will reinforce PLEN as a major contributor to meet societal missions and challenges and provide the necessary research to find solution for the societal green transition.

The collaborations across the Department will be valuable in supporting research-based teaching and ensure the development of existing and new courses to meet future requirements. One of PLEN's strengths is its courses, which comprise teaching for students from across disciplines and

which are at the intersection of the three main scientific fields with hands on experience. This is an important step towards producing the candidates preferred by stakeholders in the future and which can be leading the necessary societal transitions.

An important part of the research at the Department is to convey knowledge to the students and to produce candidates who meet the demands of public and private stakeholders. Employees at PLEN are highly engaged in their research and teaching areas, and recognise that these go hand in hand. The research groups acknowledge that it is attractive to have the students contribute to their research by having shorter or longer projects in which students are part of the daily research environment. PLEN will promote that more student projects is in collaboration with public and private stakeholders.

Theoretical knowledge is in courses and especially in projects combined with hands-on exploration to engage students to use their acquired knowledge to find solutions. This is also important in order to create independent, curious, creative and innovative candidates with a basic knowledge adapted to future needs of private and public stakeholders.

To achieve the full synergy and visibility, internally and externally, the research topics in the scientific areas of the three main scientific fields (Biotechnology, Agriculture and Environment) have been unfolded. The work has contributed to a greater degree of internal awareness of PLEN's scientific strengths and coherence, and a more visible scientific profile in relation to external stakeholders. All the scientific fields cover from basic research giving the necessary new knowledge to adding value to the society providing the necessary knowledge for solutions in the green transition.

To ensure and maintain the high engagement and level of teaching it is imperative to promote the learning environment, not only for students but also for employees. PLEN recognises the need to include digital competences in teaching and research. All teachers at PLEN have engaged with enthusiasm in new digital tools for teaching, and this experience will be included in the long term development of teaching forms. Competences in handling big data and modelling will be required in the future, so there is a need for the employees to acquire new skills and to include these in relevant courses to assure that candidates obtain these skills. Digitalization will be included in the lateral themes as well as in the development of curricula for students. In research, the principle of FAIR data – Findable, Accessible, Interoperable and Reusable data – has been adopted and will be implemented to manage research data.

A common goal will be to optimise the use of all competences, resources and infrastructure in line with one of the Department's leadership values: to have a collaborative environment. PLENs strength is the ability to collaborate across disciplines and sectors with respect and understanding for the knowledge base of the collaborator. This allows PLEN to be involved in new research areas and achieve synergy to gain more knowledge and create solutions in new ways, to meet the needs for the green transition

Goal B. Increase visibility and impact

PLEN wants to increase the visibility of the excellent research and teaching taking place at the Department and be known as an active contributing actor on the research political arena and a major contributor to the green transition. PLEN wants to be known for its research going across the research areas from elements to ecosystems working cross disciplinary and having cutting-edge infrastructure. Here PLEN wants to develop living laboratories, to support new emerging research areas and collaboration, both with academia, public and private partners.

The employees at PLEN have the highest expertise both the ones working in research, teaching and in the support functions, all working in an inspiring and vibrant environment. Both in the Department and externally, PLEN wants to be known for its collaborative culture. PLEN wants to have impact on society educating creative, independent candidates with relevant basic natural science knowledge and skills to use their competences to meet the demands of the industry and other stakeholders and as one of the main driver for recruiting good students.

A large part of PLEN's research can be categorised under selected subject areas of international and European ranking lists in the research areas of Life and Agricultural sciences, and Environmental science. In the latest NTU world ranking, UCPH fields of Agricultural Research and Life Science are found among the top 10 and top 15 universities, respectively. The ranking of Environmental Science is 16 and Plant and Animal Science is among the top 15 universities. Due to the size of PLEN, the Department contributes significantly to the statistics for these areas at UCPH. Internationally, PLEN will improve and promote its scientific position by continuing the high impact of publications, entering collaboration with other excellent research groups, and with private and public international partners.

It is important for the Department and the researchers to be visible nationally and internationally, and be acknowledged for the high scientific level. This is essential if PLEN is to be a preferred partner for both private and public collaborators, and to be attractive for national or international students and employees. Furthermore, we believe that the green transition agenda require the highest level of science to find the ultimate solutions.

Maintaining and expanding cutting-edge research facilities and infrastructures covering several experimental areas is vital to retain PLEN's scientific position and to remain attractive in collaborations. It is a goal to consolidate and expand the infrastructure listed in table 1 with annual investment both to upgrade the equipment and to ensure the expertise taking care of the equipment. There is an increasing demand to develop new infrastructure including living laboratories, both to support the ongoing research in existing and new areas and to be attractive for collaboration with academic, public and industrial partners. The focus on the profile for the three scientific fields at PLEN, and the synergy between these give rise to the need to expand the infrastructure to encompass new emerging research areas.

Since establishing a lateral theme across PLEN “Data science in plant and environmental research” there has been an increasing awareness of the infrastructure needed to support data science at the department, from developing the knowledge to handle large data set from laboratory and field experiments and building skills for data science and artificial intelligence. There is a need to gather the knowledge at the Department for research and to include these skills and competences in teaching.

Table 1. Infrastructure at PLEN.

Infrastructure	Level of collaboration	Value of infrastructure (million DKK)	Description
CAB	UCPH	40	Center for advanced bioimaging
Metabolomics	PLEN	40	Advanced metabolite analysis
Proteomics	PLEN	10	Gene expression, dynamics, modifications, interactions and structure
CHIME	PLEN	15	High throughput profiling of mineral elements and their binding forms
RAACE	PLEN	40	Advanced analytical chemistry
RadiMax	CID	15	Research in plant roots, in the soil
Phenolab	PLEN	10	High throughput phenotyping
AnaEE	European	47	Analysis and experimentation on ecosystem
Uasability	National	64	Use of unmanned aerial systems to acquire data (Drone)

A communication strategy both internally and externally will be developed to strengthen visibility and collaboration. Internally the focus will range from information about Department initiatives to be active in influencing the political agendas, priming for funding, and strategic discussions about development of the Department, its research and its teaching. PLEN wants here to be one of the important partners at UCPH and to be proactive together with the Faculty of SCIENCE and the rest of departments to influence the research political area, e.g. to bring forward UCPH as the important actor in green solutions. Externally, one entry is the website and selected press releases, which should reflect the PLEN scientific profile, potential research collaboration, and possibilities for talented students to be involved in projects with private and public companies. Another important entry to strengthen PLENs visibility externally is to support the scientist as ambassadors in presenting PLEN e.g. at conferences.

Internationally, PLEN will promote its scientific position by continuing the high level of publication, and entering into collaboration with other excellent research groups abroad as well as with private and public international partners.

Goal C. Recruit, retain and develop talented staff and students

PLEN wants to be recognised for its strength being in the cross field of basic and translational research, which, among other things, has resulted in a large proportion of private and public collaborations. PLEN wants to create and be known for its attractive research and study environments in order to attract talented employees and students. A cutting-edge infrastructure is essential when recruiting new researchers but also to retain and develop talented employees and students. PLEN want to develop teaching and education to have the most optimal course portfolio and contribute to develop the educational landscape at the faculty.

To recruit talented researchers, PLEN wants to develop attractive on-boarding packages, including administrative support and technical infrastructure support. This will be a way to attract diverse excellent researchers, both nationally and internationally. Another important parameter is to obtain a common understanding of possible career paths within and outside PLEN. The UCPH guidelines for career progression, in terms of research output (publication and funding), teaching contribution and visibility internally and externally has been supplemented with specific points relevant for positions at the department.

There is a need to focus on how to assure the career path for employees, also for other careers than in the academic world. It is important to recognise and bring all competences at PLEN from both scientist and the technical staff to support and further develop research and teaching. In creating career opportunities and networks for the current staff, there is focus on how to support sabbatical leaves. PLEN wants to develop research talents and support them in exploring the international research community, being ambassadors for UCPH and creating their own networks.

There is a need to have focus on how to prepare the students for a future career. This has to start from bachelor level to present career opportunities to the students and prepare them for their future work life. One way will be to have higher emphasis on student projects in in collaboration with the industry and to include alumni to give insight how the educational competences are important in the candidates' future career.

The Department wants also to focus on a working environment with room for diversity that will contribute to creativity and innovative minds. Everyone has to be acknowledged and respected in being fellow colleagues and leaders in open and trustful environment. In this way talents can thrive, be further developed, and contribute to finding solutions for the challenges facing society. PLEN wants to implement and further develop the working environment beyond COVID19 incl. the digital working place Through the COVID19 disruption of the "life at work", this will influence the perception of how work can be performed – online and onsite.

Goal D. Improve governance and administrative support

PLEN wants to be a dynamic and robust organisation both in organising the sections and research groups, in governance and support functions. PLEN will use lateral themes and UCPH Green Solutions Centre to give the direction for the strategic development of the staff plan, research and teaching. PLEN wants to create an optimal environment for research, governance and technical/administrative tasks at the Department. PLEN wants to keep the focus on an economy in balance and revise the budget steering tool to be aligned with UCPH's and the Faculty's budget model.

The research funding landscape is dynamic and challenging, and there is a constant need for adaptive approaches regarding research topics and infrastructure to meet the requirements of the future. It is important that everyone is aware of the dynamics and takes action when needed and to include all competences from both the scientific and technical administrative employees in developing research, teaching and governance structure. There will be a need to adapt the organisation of PLEN to meet these future challenges, including a new UCPH budget model.

During the last couple of years, the funding landscape has changed.

- Public funding has decreased and focus here has been on funding for young researchers and well established researchers, leaving those in between in a vacuum.
- A greater proportion of funding comes from private funding channels, with no overhead or max 20% to cover indirect costs.
- A larger portion of funding requires collaboration with several partners, including industrial partners

To pave the way for new funding possibilities, which require collaboration, PLEN will continuously have focus on participating in and driving networks across sectors and disciplines such as Crop Innovation Denmark and the Plant Biologicals Network. For PLEN, these networks are strategic initiatives and will be an investment in selected research areas.

With the current budget model, these changes in the funding landscape present a challenge, and there is a need to adapt the Department budget steering model to consider this. The budget steering model is a management tool and needs to be revised to include incentives and leave space for strategic initiatives and investments, e.g. to support, develop and implement lateral themes together with new and update of infrastructure. The organisation is dynamic in terms of the size and number of research groups, e.g. to support and give the possibility to new research group leaders to form their first group.

1. Attracting, developing and retaining academic talent

PLEN will promote cutting-edge infrastructures.

Motivation:

PLEN wants to maintain the high level of excellence in research and to attract and develop academic talent. To achieve this it is imperative to have cutting-edge infrastructures, both in terms of equipment and specialist knowledge. Maintaining and further developing cutting-edge infrastructure is needed to stay attractive for funding opportunities in e.g. developing green solutions for the societal and climate challenges. PLEN wants to have living laboratories where public and private collaborators contribute in developing these infrastructures and the necessary knowhow to support this. It is also necessary to align this to new research to stay the preferred partner for further funding for the green transition.

Challenges:

The knowledge of PLEN infrastructures and how to get access to these, is not always available when recruiting new employees or even for employees at PLEN. In order to maintain cutting-edge infrastructures and ensure optimal use it is important to have specialist knowledge for running, and upgrading the equipment and developing procedures. The resources for this need to be found in collaboration between the users in the section and at Department level, as this is not covered by most of the funding bodies. In light of developing living laboratories e.g. setting up pilot plants for vertical farming there will be a need to look for space to be used for this and to seek public and private partners to have to most optimal composition of knowhow.

As data science is part of the infrastructure it is important to ensure that all researcher know of the computer power in Computerome2, the use of ERDA for storage of data and are using the principles of FAIR.

Actions:

PLEN will continuously inform about the infrastructures at the Department, and how to get access to these. This will include information regarding Computerome2, ERDA and the FAIR principles. Digital tools and competences will be expanded also to be included in the Plant facilities and Workshop section by starting a new technological team to support advanced experimental equipment, methods, robot technology and data management. PLEN will support the maintenance of the equipment and support the infrastructures employing specialists. This is to ensure management, development of the equipment, training and developing new protocols. The infrastructure listed in table 1 will be consolidated with an annual re-investment of 10% of the total value of the infrastructure. There will be focus on having up to date infrastructure, and looking for new opportunities for setting up new infrastructure needed to support the development in research areas. It will also be important for developing the teaching portfolio and to meet the demand from the stakeholder for new competences to be masters by the candidates. Some of the new areas PLEN

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will look into will be how new infrastructure can support the development of living laboratories e.g. pilot plants for vertical farming in collaboration with public and private partners.

PLEN wants to use internationally recognizable career positions, attractive on-boarding packages and research environments.

Motivation:

An important point when recruiting excellent new permanent employed researchers (professors, associate professors and tenure track assistant professors) in competition with other universities is to be able to offer attractive on-boarding packages. The on-boarding packages will reflect the wish to attract diverse employees, both nationally and internationally. Likewise, it is important to promote and develop our scientific ranking when recruiting scientific employees to be one of the universities in focus when looking for job opportunities.

Challenges:

PLEN has a strong international research environment with excellent infrastructure. However, at the moment this is not sufficient to attract and recruit new employees for permanent academic positions. The requirements for the career path need to be implemented to help both new and already employed at PLEN and support having diversity among employees.

Actions:

PLEN will be proactive to promote our excellence and be able to attract new employees. It will be imperative to develop on-boarding packages, though this will require financial flexibility.

The career paths at the Department will be made more transparent. The organisation should be supportive to pave the way for future career for every employee, scientist, technicians and support staff, whether it be in academic, public sector or industry positions.

PLEN will increase focus on equality and diversity to ensure that intellectual creativity and talent can flourish.

Motivation:

PLEN wants to focus on a working environment with room for diversity that will contribute to creativity. In this way talents can thrive, be further developed, and develop research ideas and contribute to solutions for the challenges facing society. Together with the scientific environment and infrastructure, this will give room for creative minds supporting innovative curiosity driven research. The diversity is needed to be able to acquire knowledge with groundbreaking research and eventually convert this into solutions for the societal challenges. The diversity ensures that the whole chain from the curiosity driven research, acquired knowledge using creative minds and end with partnerships for the innovative process to bring products for commercialization. In

collaboration with colleagues, these creative minds will create the basis for the future development at the Department.

Challenges:

It is important to have a broad diversity among employees though it is often similar profiles, which apply for the available permanent academic positions. To create synergy there will be a need to establish a culture that can comprehend and acknowledge a larger diversity. It is important to use all skills and competences at the department both in the daily routines and in developing research and teaching, including the technical staff with their expertise.

Actions:

PLEN wants to keep the open culture and will acknowledge the diversity. Likewise, scientific excellence will not be the only focus point when recruiting new employees, the other areas described in the recruitment plan are included. To attract and keep more women in science, PLEN will work on a broader wording of the advertisement just as the department will have focus on how to be attractive to women to stay in science.

PLEN will set focus on how to include all competences at PLEN when planning and implementing new projects and when planning the courses.

PLEN will work to enhance staff and student mobility.

Motivation:

PLEN encourage employees to have work experience in their scientific curriculum from other places, either at other universities, public or private companies. PLEN will be proactive to encourage students to study abroad as this is a unique opportunity to develop an international network and get international experience.

Challenges:

Having experience working in different laboratories give insight in different research environments and create network. However, when first employed in a permanent position it is difficult to find resources and time to take a sabbatical to stay in another research environment. As every employee has both research activities and teaching obligations, it can be difficult to find time for sabbatical when teaching in courses and supervising student project. The newly development of the online tools to quickly connect to colleagues no matter where in the world the person is, and to collect people for meetings even across countries give new opportunities for staying in another research environment.

At the moment it has been necessary to limit the number of agreements with other universities for student mobility as only a few students take the opportunity for a stay abroad. From the student's point of view it is difficult to choose between the possible universities, to arrange and finance the travel and stay abroad.

Actions:

PLEN wants to implement and further develop a mobility programme to encourage employees to take sabbaticals to visit and work in another environment. This is supported by the online tools now available.

To help the students and encourage them to take on a study abroad, students will meet fellow students which already have been abroad when starting their education and meetings will be arranged in due time for applying to go abroad in conjunction with their courses to inform them of the possibilities and how to engage in the practicalities regarding their stay.

2. Education with closer ties to research and practice

PLEN wants to strengthen the linkage between research and teaching – and vice versa.

Motivation:

PLEN wants to have a stronger link between the research areas and teaching when developing existing and new research areas. The education programmes and teaching are already closely connected to research where both teaching and research are found in three main scientific fields that constitute PLEN; Agriculture, Biotechnology, and Environment, and in the intersection between them. PLEN wants to integrate the research profiles from the three scientific fields in keeping the course portfolio up to date. It is also important to use the research areas which go across the three scientific fields to further strengthen the linkage between research and teaching. This will give the candidate the most up to date knowledge and competences needed to develop green solutions. There is a need to give the student information regarding the possible ways from bachelor to master and using this to give input for a transparent and simplified way through their educations.

PLEN will strengthen the research across the three main scientific fields, and will use lateral themes and the UCPH Green Solutions Centre to develop new research areas across these. Likewise, the profile of the three scientific fields need to adapt to the societal needs without giving up on the necessary basic research. The lateral themes will generate synergy as the existing research areas give rise to new research areas and thereby create new funding possibilities and support the development of educations and courses.

PLEN will ensure that it will be visible how the educations and courses contribute to the student's skills and competences in sustainability. It is important that each student from the respective education knows how their specific scientific field can contribute to provide green solutions and apply UN SDGs.

Digital competences and data science is a central part of the needed skills for employees as well as for students. Therefore, it is important to have focus to ensure knowledge sharing among employees and a progression of the digital competences in the courses offered to the students. Likewise, there

is a need to find the most optimal way to include digital tools in teaching to support onsite teaching.

In the future, PLEN wants to be known for its teaching and how it is closely connected to the newest research, give insight how to develop green solutions for the societal challenges, and that theoretical knowledge is closely connected with practical training. Hands on experience is included both in the courses and in especially in the projects where the students are working directly in the research laboratories and scientific environment.

Challenges:

In developing the educational landscape there will be a dialogue with SCIENCE to have a more transparent and clear way from bachelor to master level. To maintain and further develop research-based teaching, there need to be in a close dialogue with the Heads of Studies and the fellow Departments at SCIENCE in defining the profile of the education programmes and courses anchored at PLEN.

When recruiting new employees their teaching skills are evaluated together with their possible contribution to the course portfolio in relation to their research. In line with developing new research areas at PLEN these will be evaluated to assure that courses in the future are also research based. Likewise, when optimising course portfolio at PLEN to follow the development of the educations at SCIENCE, this can lead to developing new research areas.

For many students, access to and experience in research laboratories come late in their education. The students appreciate a closer link to these facilities and it will give the students the feeling of “belonging” to the Department. There is a spoken wish from the students to get a closer connection and dialog with the research areas at PLEN.

There is a need for lifelong learning, and with the expanding knowledge and skills in PLENs scientific fields there can be an unused potential for establishing courses for continuing education. PLEN will continuously be aware to use opportunities to offer courses when the demand arises.

Action:

PLEN initiates every year lateral themes across the three scientific fields. The first prioritized lateral themes were: Microbiome in Action, Circular Biological Production Systems and Data science in plant and environmental research. I More themes has been initiated and in the coming years there will be new opportunities to suggest new lateral themes. The established lateral themes will contribute to teaching in existing and future courses and will be described along with the research area.

Regarding the digital competences, course responsible are made aware of the importance and together with the Head of Studies there has started a process to get an overview of what competences are needed and which is been included in the teaching. An overview of these competences are needed to ensure the progression of the digital competences in the courses.

There will be focus on developing activities where the students and teachers interact outside the teaching hours. Likewise, there is focus on projects in the scientific environment and in collaboration with the public sector and private companies.

PLEN will focus on research-based teaching. The development of courses and contribution to educations in the future will be the basis for the strategic direction for research at PLEN.

PLEN will collaborate with other Departments and Faculties in the educations anchored at PLEN.

PLEN will be proponent that every Department follow the code of conduct in teaching to give the students the most optimal education. PLEN will evaluate the possibilities for continuing education in the research fields, among others, how to expand the opportunity to develop courses for DFC.

PLEN will ensure that the students acquire competences to work across different research areas and be able to address green solutions for the societal challenges. It is important that the students obtain knowledge and competences working with sustainability in their scientific fields and can work across disciplines in partnerships.

PLEN wants to promote challenging learning environments for students and employees.

Motivation:

PLEN wants to have an environment where there is the needed laboratory space to perform research and to meet the requirements of new cutting-edge infrastructure. The working environment is important, and PLEN is actively working for a mutually respectful culture where it is a part of everyday life at the Department. PLEN wants to blend onsite and online working and learning environments. There will be an ongoing need to keep up the standard for a safe, inclusive and secure working environment.

For PLEN it is important to ensure students a thriving study environment where they are close to the research area. PLEN will work to find ways to give the students and researcher new ways to meet and interact..

Challenges:

With all the building and renovation activities, the laboratory space is under constant pressure to comprehend new equipment. This also count when research groups expand, where the challenge is to find adjacent space for new employees to have a close connection to enhance synergy and knowledge sharing. It is a challenge to keep up the high work environment standard with a high number of short-term employments with a diverse cultural background.

At the moment, rooms has been allocated for student activities e.g. for cider production, growing edible fungi and storage rooms. Currently only limited space has been assigned for the Biotechnology students and Natural resource students, which share a “hjemstavnslokale” and SUND has provided Animal Science students with a place to be shared between BSc and MSc

students. However, there is still need to find more space to be able to accommodate all educations connected to PLEN, which is not possible at the moment due to the current building situation.

Action:

In the CPSC building, PLEN will create flexible laboratory space, which can be used by PLEN researchers across the sections. The working environment has a constant focus that everyone thrive at work. For the students, PLEN actively seeks to find possible space for social activities. As it can be difficult to find adjacent space when a research group expand it will be imperative to create a working environment to support new ways to create synergy and knowledge sharing. PLEN want to accommodate the wish from the students for places for activities outside teaching hour when it is possible to find the needed space.

PLEN will further develop and implement digitalization in teaching.

Motivation:

Research groups at PLEN have been working with handling big data and have been at the forefront of digitalization for some time. PLEN recognises that there is a need to develop skills in this area both for the employees and for the students. Digitalization is taken into consideration when revising course content and when looking at the progression between courses. In this context, the education programmes in Biotechnology have been the front-runners at the Department. PLEN wants to learn from the disruption of the teaching forms during the corona pandemic and ensure knowledge sharing to use this to develop teaching forms.

Challenges:

There is focus on getting an overview of which competences the students obtain during their educations and the progression of these through the courses to be able to follow up on which competences are lacking both for the students and for the teachers. The demand for digital competences from the stakeholders are expanding and not all teachers have these competences, as this is a rather new requirement. It takes resources to develop and to optimize online teaching. By the extraordinary efforts, PLEN teachers have developed a wide range of digital teaching tools, and these need to be evaluated to take the best to be included in the teaching tools portfolio.

Action:

The focus on the digital competences has started in the first year teacher meeting at all bachelor educations connected to PLEN to ensure that the student has a solid base of digital competences to build on during the rest of their education.. There is likewise focus on the progression of the digital competences on the rest of the educations anchored at PLEN.. As the educations already have several digital competences included, an analysis of the needed competences is required. On one side, digital competences in the student curriculum need to be included also in the learning goals for the specific projects. On the other side, teachers need to be equipped with the required competences

so they can develop the courses and include digitalization in teaching. PLEN will also work to widen the digital knowledge and competences of the teachers.

The lateral theme in “Data Science in plant and environmental research” has focus on which digital competences the students need to acquire and how teachers will get the necessary update to be able to include this in their teaching.

New digital teaching forms and tools have been developed, and have given an experience how to support the learning of the students. For the digital teaching forms which have proven to be superior to on-site teaching PLEN will initiate knowledge sharing among teachers, and support the further development of the digital tools. It will where relevant be included in the course descriptions e.g. new exam forms.

PLEN will attract and graduate talented students who possess solid academic skills, an understanding of practice and the ability to collaborate across fields.

Motivation:

In recruiting students for the educations anchored at PLEN, the focus will be to give coming students a clear idea of the educations’ profiles so they can chose the right education from bachelor to master. PLEN will influence the profile and make sure that there is an alignment of the expectations when entering an education. The path from bachelor to master need to be clear in a simplified educational landscape with focus on green educations. PLEN wants to produce candidates with deep academic skills together with the ability to work across fields and be able to work to provide solutions for the green transition. Through the courses, the students will be acquainted with how to work to come up with sustainable solution by bringing the different scientific fields’ and research disciplines’ competences together. The candidate will have the necessary competences to provide the basis for solutions for the green transition.

Challenges:

Besides, the basic scientific competences, there is continuous need to be aware of new skills to be included in the educations so the candidates will be attractive to the stakeholders. Beside from these competences there is a need to develop the ability to work across disciplines which is even more essential when getting the candidates ready to be important actors in providing green solution. It is essential to graduate candidates needed by the stakeholders to meet the criteria that the students get employment and make the students aware of which career possibilities they have. The amount of international students on master level can be a challenges if it isn’t taken up and used as a positive input where all the student get insight in other cultures.

Action:

PLEN will work actively with the profiles of the educations anchored at PLEN, to align these and to meet the expectations of the future employees and when recruiting new students. The educational landscape need to be clear so each education has its own profile and investigate if this even should be simplified e.g. by fusing educations. PLEN will work proactive in developing the education connected to PLEN, and take the necessary measures when looking at the measurable standards.

Likewise, PLEN will ensure a continuous development of the educations and courses as new research areas and demand for new competences arise.

PLEN will focus to use the international background of the master students when teaching giving the students insight in how other cultures solves societal challenges and they get acquainted with other cultural ways of approaching a problem.

PLEN will develop courses that give the students both the solid academic skills, solid background in natural science and the ability to work across disciplines. With this cross disciplinarity and the candidates' basic competences PLEN will ensure they also have skills and knowledge in developing solutions for the green transition.

PLEN will focus on carrier development in collaboration with external national and international partners.

Motivation:

PLEN wants to prepare the students for the future career paths and assure that they will be attractive for the stakeholders and be employed shortly after graduating. The candidates educated at PLEN are recognised by stakeholders to have a deep natural science background and for being creative and innovative when using their competences. To prepare students for their future career, students with different educational backgrounds study and work together to get experience in solving cases by using competences across disciplines. It is important to have education programmes that meet the requirements of the stakeholders now and in the future e.g. digital competences, knowledge to work with sustainability and create solutions for the green transition. PLEN wants actively to use their alumni network to broaden the students' and their teachers' horizon of the candidates career opportunities.

Challenges:

A new profile for Biotechnology educations has been developed to ensure candidates that can use molecular biology tools to provide solutions for the green transition. This profile needs to be fully implemented as this is expected to be the change breaker for the unemployment rate, for Biotechnology candidates when looking for their first employment. This will then lead to removal of the dimensioning of these educations. However, the students from all educations need to be prepared for their future careers. It can be a challenge that the diversity of career possibilities changes fast, so it is not always possible for everyone at PLEN to follow this development.

Action:

PLEN will focus on activities to inform the students of their career opportunities and prepare the students for future job market. One way is to increase the involvement of stakeholders in teaching and to help the students to explore the possibility to have projects in collaboration with the public sector and private companies. For all educations it is required that all teachers are kept updated on the career possibilities for every education they are involved with both teaching and supervision.

3. Collaboration and societal commitment – nationally and globally

PLEN will promote our scientific position internationally

Motivation:

The scientific standing of the research environments are recognized across academia and influences the evaluation of applications as well as the recruitment of employees. Several funding bodies require collaboration and the status as preferred partner is improved by the scientific position. PLEN wants to promote our position internationally, both in the scientific community to be the preferred partner in research collaborations and to attract talented employees.

Challenges:

PLENs three scientific fields, Agriculture, Biotechnology and Environmental Science, contribute significantly to UCPH ranking, however, the Department is not widely recognized for this. After an internal process where the current key subjects have been identified and thereby the profiles for each of these scientific fields has been detailed described, there is a need to communicate and use these actively. Currently the profiles are being aligned to the teaching portfolio at the department. Though the scientific fields have been described, these are dynamic and will give rise to the emergence of new areas especially across the three main fields at PLEN. The funding landscape is changing and more calls are in collaboration with non-academic partners where all researchers from the three scientific fields at PLEN need to see the possibilities and necessity to include the whole chain.

Actions:

Internationally, PLEN will improve and promote its scientific position by continue to publish in high-ranking journals. PLEN will develop a communication strategy to support and promote the Department's scientific position.

There is a greater demand of being able to work across fields and span from elements to field and system level. PLEN will also encourage new emerging research areas across the three main scientific fields at PLEN. PLEN will support the further development of these and the main scientific fields to be competitive and align to the political research agenda and funding landscape.

PLEN wants to contribute to resolving the major global societal challenges.

Motivation:

The research at PLEN has the knowledge and competences required to be a key player in resolving global societal challenges and to be part of producing candidates in this field. PLEN wants actively

PLEN Målplan 2023: Talent and collaboration – Udarbejdet i 2018. Opdateret i April 2020. Opdateret til 2025 mål i Marts 2021

to be part of building knowledge and developing solutions to meet the new requirements coming from the climate changes, and actively contribute to the green transition in compliance with UN SDGs

Several research groups at PLEN have a long track-record working with and within different UN SDGs, and this has made PLEN well known around the world. Most of the basic research at PLEN has likewise applied goals, which contribute to the societal challenges and provide solutions for the green transition

Challenges:

The green transition needs to focus on how solutions can be provided. These has to be in compliance with the UN Sustainable Development Goals which still have a major impact on many foundations' specific calls. It is necessary to create attention to and understanding of the goals and how to resolve the global societal challenges so that the research can be set into the required context and direction.

Actions:

PLEN wants the researchers to be aware that most of PLEN's research addresses the green missions and topics. The researchers will be primed how to address specific foundations' wish to address selected missions. It is important that PLEN researchers' impact on the green missions will get optimal awareness internally. Externally it is important to clarify and communicate the Departments research areas' strong position being a key player to provide solutions for the societal challenges and for the green transition.

PLEN will be a driving actor in developing green solutions

Motivation:

PLEN wants to be one of the driving actors in UCPH in creating a forum for cross disciplinarity and solutions for the green transition. PLEN research areas are in the center to provide the necessary knowledge and competences to be able to go into partnerships and in collaboration deliver the green solutions. PLEN wants actively to be part of building knowledge and developing solutions to meet the new requirements coming from the climate changes, and actively contribute to the green transition. Likewise, the candidates from PLEN has been trained in working to develop solutions based on their competences.

Challenges:

Though PLEN has the necessary scientific competences, there is a need to address how the different researchers can be part of cross disciplinary collaborations. For some researchers it is a new way of collaborations so there is a need to learn how to interact with other research areas including social science, and be open for how the whole knowledge chain from basic research via applied research to innovation is to be included to develop the best solutions for the green transition. There is a

demand from the students that the competences for sustainable and green solution is more visible in the courses.

Actions:

PLEN will support the development of the UCPH Green solution Center to embrace all the needed research areas to address the green solutions. Though this is a bottom up approach, there is awareness at PLEN that there is a need for information on how to address this cross disciplinary collaboration and to see their research in this new context. It is important that PLEN researchers' impact on the green transition is conveyed to the teaching to have the student mindset on the societal challenges and how important it is to use their skills to find the green solutions.

PLEN will develop lateral themes to create collaborative environments within PLEN and across UCPH Departments.

Motivation:

PLEN wants to strengthen the collaboration and synergy of research across the three main scientific fields by lateral themes. These overarching lateral themes can help to establish linkages across sections or SCIENCE departments and highlight areas of strategic importance. PLEN wants to promote a collaborative culture inside the Department and be the preferred partner within UCPH and with private companies and the public sector, nationally and internationally.

Challenges:

There is a need to focus on how the potential synergy between the scientific fields at PLEN can be exploited and supported. Today excellent research also requires collaboration between scientific groups, and it is important to be a preferred partner.

Actions:

Each year since 2018 a new lateral theme has been defined and initiated. It is the aim that these themes later will be integrated in the Department's research areas. Task forces will be established to define these topics and how they can be integrated in the Department's research and teaching. The lateral themes will be used to develop PLEN and strengthen visibility within the area.

PLEN will strengthen private and public research partnerships in Denmark and globally.

Motivation:

PLEN wants to be known as the preferred collaborative partner. Working in the range from basic science to applied research covering from elements to ecosystems gives PLEN the opportunity to be an attractive partner in public and private partnerships. This combination of basic and applied research has already allowed PLEN to build a portfolio of external partners. Together with UCPH

and SCIENCE, PLEN wants to strengthen the collaboration and visibility to private and public partners.

Challenges:

The funding landscape is changing, and in order to be competitive it is necessary to enter collaborations with both academic institutions, public sector and private companies. Strong partnerships are crucial for addressing new challenges that have an impact on society, for developing new solutions and for attracting funding. There is a growing demand to be proactive, foresee and influence the development of the coming calls e.g. from EU.

Actions:

PLEN will expand the knowledge of the existing networks and use them actively for funding possibilities. PLEN will have focus on how to help the younger and/or foreign researchers to establish networks and get into contact with the right partners. PLEN will be initiator of new network initiatives, and be open to participate when invited in other networks. A newly developed network is DPI, Danish Protein Innovation, where PLEN participates and will further advance the research in developing new opportunities for alternative local protein sources. Nationally, PLEN has been the driver of establishing two networks.

- Crop Innovation Denmark, CID.
 - This is a strategic network of all Danish breeders together with UCPH, Aarhus University (AU) and Aalborg University (AAU) deciding on topics of mutual interest for which funding is applied in collaboration.
- Plant Biologicals Network, PBN
 - This network was launched in the autumn 2018. This is a collaboration between Novozymes, Bayer Crop Science, FMC, the following universities: UCPH, AU and SLU in Sweden, as well as the Danish Technological Institute. The focus of the network is to exchange knowledge regarding plant biologicals.

To strengthen and optimize collaboration with private companies, PLEN will be open to include private companies at the Department's premises. This has already led to several applications and funding in collaboration with these companies.

As it is an expanding task to monitor the political research arena and be able to be proactive to influence calls PLEN collaborates with UCPH and SCIENCE in these aspects.

PLEN will also actively use these networks in teaching to give the students insight in how their knowledge will be used in possible career possibilities.

4. One unified and focused university

PLEN will continuously have focus on the career for young scientists .

Motivation:

PLEN has successfully developed a united Department with common values for every employee and will develop the leadership according to KU's principle for good management practise. PLEN wants to focus on the career development of both current and recruited young scientists. The building blocks in the organisation of the Department are the research groups.

Challenges:

There is a flow of young researchers coming to the Department and depending on their funding success there is a continuously need to look into the need to establish new research groups. At the same time there is a need to revise the existing research groups e.g. due to generation transition.

Actions:

To refine the organisation, the management guidelines are updated with new requirements meeting the requirements and needs of the employees. PLEN wants to give advice for the career of the young researchers and to support them in starting their research area when possible funding is available. This will lead to a dynamic organisation of the research groups. The structure of the sections in regards to number of research groups are revised when young researchers establish their own research area.

PLEN will integrate and include all competences in planning research and teaching

Motivation:

Today research and teaching is only possible when collaborating across research fields and across scientific and technical skills. PLEN wants focus on integrating all relevant and necessary competences to keep the department in the forefront in the research areas and in teaching.

Challenges:

As PLEN is multi international, it is not known for all employees which educational background the technical staff possess. Likewise, the department has a size where everyone cannot have the full overview of all the competences at all levels at PLEN.

Actions:

There will be focus on which competences there is at PLEN both on laboratory and plant facility level. Concepts will be developed to help to get overview of the current competences and how these can be integrated. There will be workshops to share good practice in involving all competences to optimize e.g. project planning and develop new practical courses.

PLEN will integrate the lateral themes to direct the development of the Department, both for teaching, funding initiatives and when attracting new employees.

Motivation:

PLEN wants to develop and strengthen the three main scientific fields, Agriculture, Biotechnology and Environmental science, and their intersections. The integration of the lateral themes will create synergy, not only within the Department, but also across UCPH. PLEN participates actively in the themes across of SCIENCE covering Water, FOOD, Urban Farming and Global Development. Their success will be measured by the extent to which the lateral themes are integrated into research and teaching. This will create new possibilities for collaboration and funding nationally and internationally also for thematic calls e.g. providing solutions for the green transition

Challenges:

PLEN has an unique position to develop the unused potential across the strong scientific fields at PLEN. This gives a unique possibility to develop new research areas when researchers across the disciplines work together to define new lateral themes. The profile of the three scientific areas need to be communicated to be visible, and there needs to be focus on how to implement updated profiles in relation to the societal needs and developments.

Actions:

When the task force has defined the new lateral themes, the success will depend on how these will generate a new research area, which will be included in one or more sections at the Department. Likewise, it will be integrated in the course portfolio at the Department. The lateral themes is one way to keep focus on the research areas in the changing funding landscape. Likewise, the department supports the three scientific fields in how they can contribute to the political research agenda including the green transition.

PLEN wants an economy in balance. *Motivation:*

PLEN wants to have a robust organisation where the budget model supports the main activities at the Department, research and teaching. PLEN will adjust the management budget tool to sustain this and to support the main scientific fields and infrastructure at PLEN. The budget tools will be aligned with the new UCPH/SCIENCE budget model and will be the basis for PLEN to have an economy in balance.

Challenges:

It is important to assure continuity at the Department to meet generation transition, and to keep cutting-edge infrastructure, both equipment and expertise. There is a need to focus on developing key activities within both research and teaching.

Actions:

PLEN Målplan 2023: Talent and collaboration – Udarbejdet i 2018. Opdateret i April 2020. Opdateret til 2025 mål i Marts 2021

PLEN will revise the current management budget tools at the Department to include incentives to support research, infrastructure and teaching. The budget tools will be aligned with the strategic decision by the management to assure continuity. It has to support strategic investments to develop future research and teaching areas so PLEN still will be in the forefront of its research areas. The management budget tools will be optimized where needed to align with the UCPH/SCIENCE budget model.

PLEN wants to optimize the high level of external funding.

Motivation:

PLEN will optimize the external funding in a focused and coordinated effort on three levels: 1) strategic initiatives, 2) priming of PLEN researchers and 3) professional funding support.

It is necessary to maintain the high level of external funding at PLEN. PLEN researchers already submit a large number of applications. However, the success rate can be improved by optimizing the application process. Likewise, PLEN wants to be proactive and strategic in affecting upcoming calls or research policy to ensure inclusion of PLEN's research areas.

Challenges:

There are several challenges in the funding landscape. Public funding has decreased and focus here is funding for very young researchers and well-established researchers, leaving those in between in a vacuum. Most calls have changed from primarily having focus on free research, towards calls with specific requirements, e.g. collaborative projects with the industry or addressing specific societal challenges. In addition, a greater proportion of funding comes from private funding channels, with no overhead or max 20% to cover indirect costs.

Actions:

PLEN will work strategically on influencing the relevant research policy agendas by proactively contributing to national and European reports or work programs, which serve as the basis for defining public funding (FORSK2025, EU framework programs, World Class food innovation, Bioeconomy Panel Reports etc.) and by participation in relevant committees and fora for lobbying for PLEN research areas. The international foundations, such as e.g. Bill and Melinda Gates Foundation are an unexplored relevant funding source at PLEN and here PLEN wants to build up experiences and competences as to how to approach these foundations to obtain funding for research meeting the needs of the UN SDGs.

The already established priming activities and efforts at PLEN will be coordinated with the support from SCIENCE (SCI-FI) and KU (EU office and TechTrans). The researchers will timely via mails and meetings be provided with up to date knowledge of the research political agendas which are relevant for the specific calls. The meetings also serve as a forum for potential applicants to discuss possible collaborations and to exchange knowledge about external collaboration partners. The young researchers need to be trained to be able to see the possibilities to work with industry and they need to be introduced to the relevant companies and how they approach them. The priming

efforts at PLEN will look into both the strategic importance of the calls, and to have the right balance of applications with an optimal overhead contribution.

Selected calls with large grants (e.g. the Danish Innovation Fund, the Danish National Research Foundation and the Novo Nordisk Foundation Challenge) require strategic considerations for PLEN and the potential main applicants will be invited to present their idea to the PLEN Executive Board. This is to ensure strategic alignment with the development of PLEN's research areas and research based teaching.

PLEN will continue to have emphasis on improving professional project management support that is capable of administrating large, multi-actor projects from several grant-givers. Likewise, there will be focus to include technical competences, when planning experiments for projects, to ensure they are having the right deliverables and time frames to reach the milestones.

The researcher is offered individual support to ensure a professional and focused application. Funding support ensures that the right partners and support offices at SCIENCE and UCPH are involved in the process enhancing cross going collaboration.

5. Process and employer engagement

The goals for the PLEN Strategy 2023 were developed with input and inspiration from the 24-hour seminar held in April 2018. 73 employees and students participated, representing several fora, including the Executive Board and Head of Sections, Research Group Leaders, teaching and research committees, the local collaboration committee, Head of Studies, and representatives from the student organisation. The goals were finalised after being discussed in the Executive Board and the PLEN Leader Team (PLT).

The first draft of the Goal and Action Plan has been discussed in the above mentioned fora, which participated in the 24-hour seminar. The students' input was further ensured with contributions from the teaching committee and the newly formed PLENrådet, including the chairperson of the student organisation and the Executive Board.

In March 2021 the PLEN strategy, 2022 to 2025 was revised after discussions in the executive board. The revisions was based on input from the yearly ideation meetings with all 45 research groups and the yearly 24 hour seminars with the participation of PLEN leaders at all levels (Executive Board and Head of Sections, Head of Research Group and the Head of Studies). A hearing in PLEN leader team and the collaboration committee consolidated the revision.

The strategy is actively being used and the action plan is formed through interaction between the fora at PLEN. The executive board invite every year every research group leader for individual meetings – called Ideation meetings - where the focus is the scientific development.

Every year a 24-hour PLEN development seminar is held with the participation of PLEN leaders at all levels (Executive Board and Head of Sections, Head of Research Group and the Head of Studies), to work in detail with selected parts of this strategy. The topic for these 24-hour seminars have been:

2018 – Talent and collaboration

- Description of new or re-thinking of existing lateral themes at PLEN that will strengthen the development of PLEN towards 2023
- Mapping of current teaching and research within the main areas of PLEN
- Connections of circles and identity of PLEN based on mapping
- PLEN strategy 2023; Draft goals and actions

2019 – PLEN in the future – research and educations

- Strategic Connections between PLEN research and educations
- Development of PLEN – A strategic discussion on PLEN's future position
- Unfolding the PLEN lateral themes

2020 – PLEN leadership at all levels

- Scientific introductions – To sections and research groups
- Communication & Dialogue – PLEN leadership at all levels
- Unfolding the PLEN lateral themes
- Navigating in a Dynamic Funding Landscape

Proces for behandling:

Nærværende målplan er udarbejdet i sommeren 2018. Opdateringer er foretaget i 2020 efter behandling på PLEN DIR temamøde d 26/2 2020 og PLT d 20/3 2020 samt Feed back fra Fakultetsdirektionen modtaget d16/4 2020. Opdateret Målplan er fremsendt til Fakultetet d 25/4 2020.