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Aalto University

CHEM, Strategic Planning 2017-2020

School's strategic plan in a nutshell

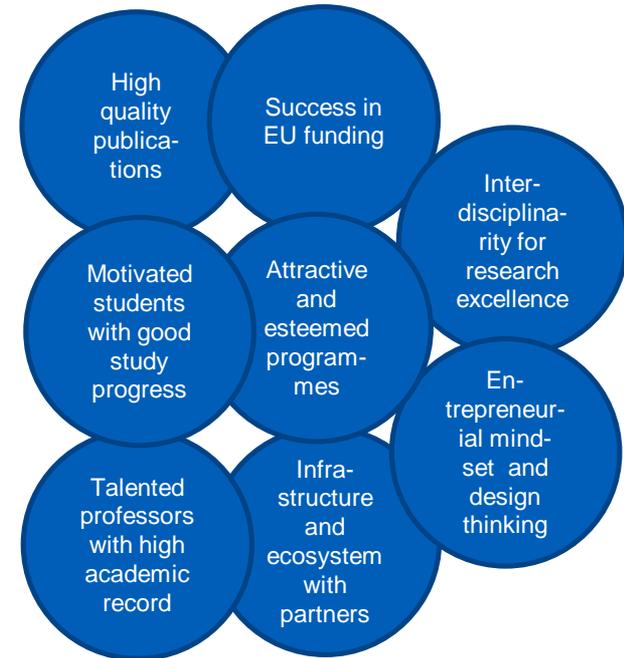
Strategic objective



Main implementation actions



Target state 2020



Target state 2020

- A large number of rising talented (champion) professors with excellent scientific records reaching to the top in the Nordic countries with the levels of DTU (e.g. 19% of top10% publications).
- High success in EU funding, the level of 2015 more than doubled in 2020, through more efficient networking (e.g. EIT actions), active tutoring (ERC), and efficient support services.
- Attractive and esteemed educational programmes which graduate experts with a wide range of employment opportunities with a well-known brand in the industry. Increase of both Finnish and international applicants to all educational programmes and a continuously increasing employment rate of graduates.
- Graduated students have good working life skills through collaboration with employer organizations, e.g. through studying during internships.
- Novel openings with 3-5 strategic industrial partners, including all aspects of Aalto partnership model (e.g. cooperation in research and studies, joint facilities and infrastructures, joint positions, employer branding and recruiting), systematic channel to get feedback through industrial advisory board, and continuous collaboration at all levels including CEO and CTO meetings according to the annual clock.
- Internationally attractive ecosystem around infrastructures, research themes, and education in “Bionova” together with a range of partners from strategic collaboration to a lively start-up and SME ecosystem utilizing the flexible facilities.
- Interdisciplinary collaboration is a solid mechanism including joint affiliations (such as Designer in Residence and Executive in Residence), showing and co-creating creative activities through multidisciplinary student projects and showcasing success stories, all core activities developed with creative practices and entrepreneurial mindset in mind through involvement of experts.

Word-class
excellence

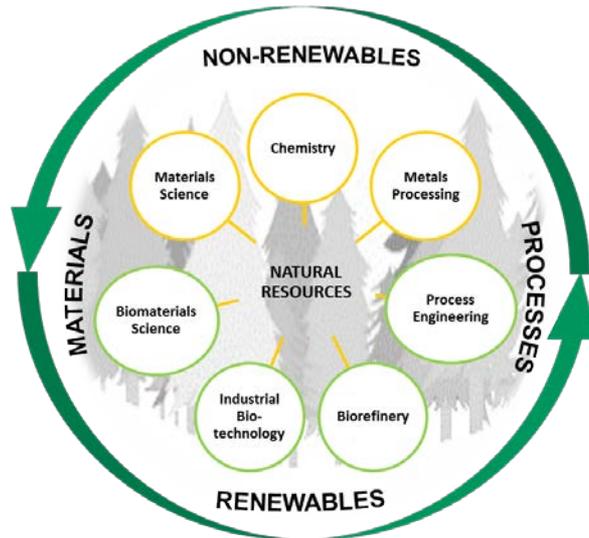
Esteemed
brand in
education

Strategic
collaboration
with a range of
partners

School's focus areas

Vision 2020

The School of Chemical Engineering carries out world class research and education with multidisciplinary mindset in the science and engineering of natural resources for circular economy and bioeconomy.



Non-renewable materials and their processing

Focus in the non-renewable materials science has been adjusted from traditional metal forming towards advanced functional materials as well as materials for energy production and storage. There is a strong link between the basic chemistry (inorganic materials chemistry, electrochemistry, computational chemistry) and the non-renewable material science. Materials processing concentrates on sustainable solutions with metallic materials processing and recycling in focus.

Biomaterials and their processing

Activities in chemical engineering have been adjusted to the massive change from fossil-based economy towards bioeconomy. The traditional forest products-based research (papermaking and wood technology) has changed over to biorefinery, containing novel bio-based materials, chemicals and biofuels. In the area of industrial biotechnology, effort has been put on the emerging field of synthetic biology.



Key development actions

- Further strengthening of focus areas by targeted TT-recruitments, staff scientist recruitments, post doc programmes, infrastructure investments.
- Targeting more in high quality than in quantity of publications. A systematic support of young professors to become talented (champion) professors in their fields.
- Securing funding in the rapidly changing funding environment through, e.g., more collaboration with start-ups and SME´s that is required by TEKES, more EU funding through more efficient networking such as participation in EIT activities, active networking with VTT, LUKE and GTK, and targeted donations for, e.g., infrastructures. Strategic partnerships with VTT, GTK, LUKE, and 3-5 industrial partners.
- Focus to develop more attractive and esteemed educational programmes with good student study progress (increase of students with 55 credits per year). Fluent collaboration with employer organizations in promoting students' working life capabilities.
- Concentrating on Bioeconomy and RawMaterials (RAMI) infrastructures and well-functioning facilities together with both industrial and academic partners to ensure co-creation, collaboration, and resource efficiency. Efficient school level technical support together with academic support (new scientists) for infrastructures.
- Strengthening the interdisciplinary network at Aalto to increase the entrepreneurial mindset and design thinking at CHEM.

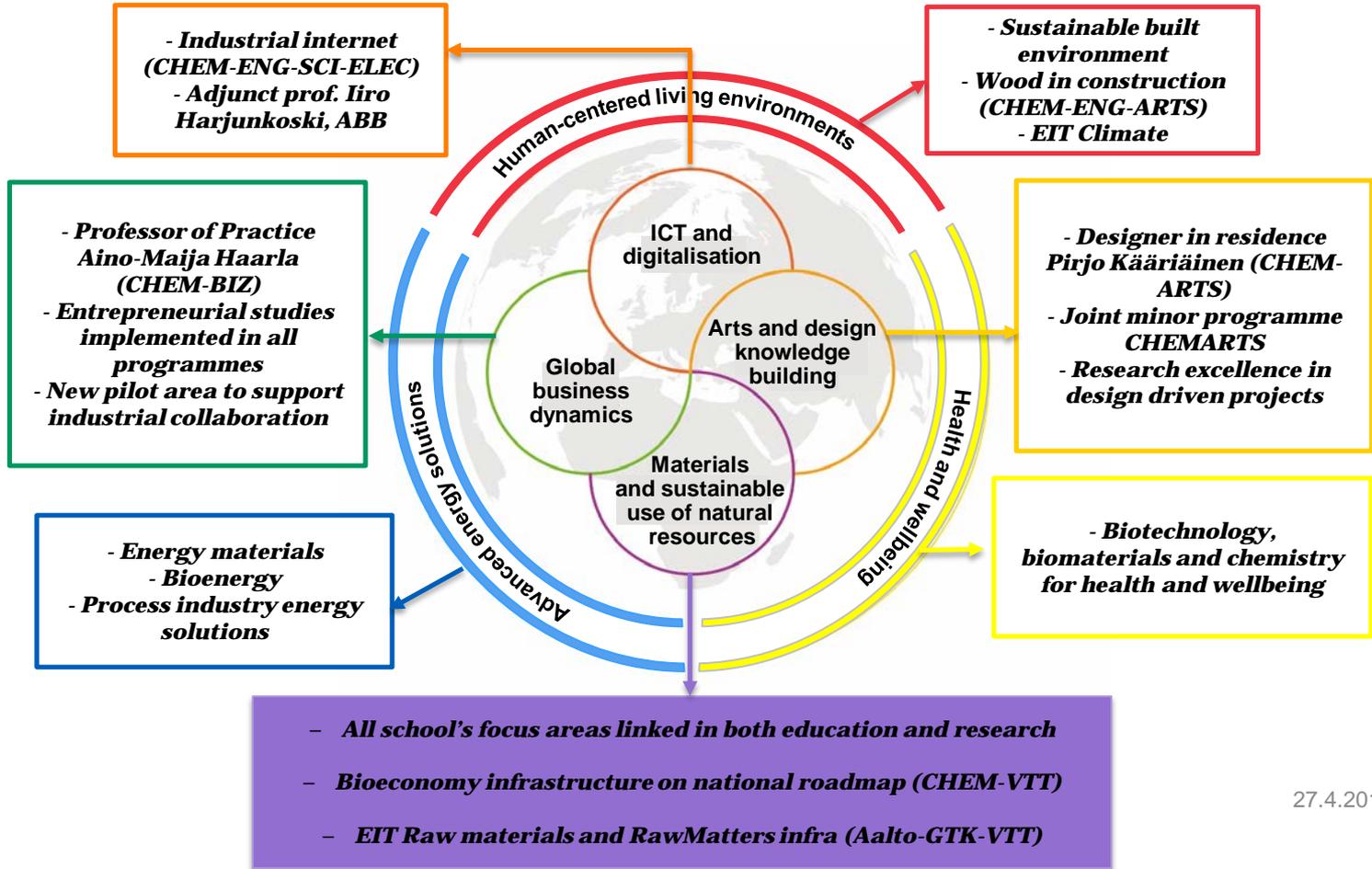
School's role and contribution to the key research areas of Aalto

- ## Platforms
- Digi: industrial internet
 - Energy: Energy efficiency programme
 - Health: biotechnology
 - Living+: Wood construction
 - Material: Bio-materials, metallic materials, Energy materials

- ## Programs
- Educational programmes:
- Energy
 - Life science technologies

- ## Factories and Accelerators
- New pilot area in "Bionova"

- ## Labs and Hubs
- Joint spaces
 - LUMA





Research excellence for academic and societal impact: Target state 2020

1. Research excellence

- The proportion of internationally high quality publications (Jufo 2 & 3 at 10% top publications) is significantly higher than that at 2015 reaching benchmark DTU levels.
- Focus more on high competitive research funding (Academy of Finland and especially EU) through active tutoring, efficient support services and increased networking.
- Novel openings with industry through CHEM strategic partnerships (3-5).

2. Research environment

- Modern and novel infrastructures (Bioeconomy, RawMaterials) in full use by Aalto University faculty, other scientific communities from Finland (national profiling) and elsewhere, and by industrial partners.

3. Research networks

- Strong international academic partnerships on key research areas and fruitful co-operation activities in educational projects. Close collaboration in EIT RawMaterials and EIT Climate.
- National strategic partnerships with VTT, GTK, LUKE and given universities.

4. Innovation ecosystem

- CHEM has an internationally attractive ecosystem with VTT, GTK, LUKE, start-ups, SME's and large companies around infrastructures, research themes, and education in "Bionova".
- Industrial advisory board is actively supporting all core activities.

Publications
in the JUFO 2
and 3
categories at
the top 10%
of their field

Efficient
infrastructure
and
ecosystem
together with
partners

EU funding
through
international
networking,
EIT activities,
and efficient
support



Renewing society by art, creativity and design: Target state 2020

1. Excellence*

- CHEM has a solid mechanism to collaborate with ARTS such as hosting continuously one or several Artist in Residence and Designer in Residences.
- CHEM-ARTS collaboration leads to interdisciplinary research with high impact publications.

2. Visibility & impact

- Excellent visibility of school´s research and education for all stakeholders through exhibitions and different co-creating artworks.
- Open campus at CHEM by sharing galleries, co-creating artworks, and initiating creative activities.

3. Broader art-based offering

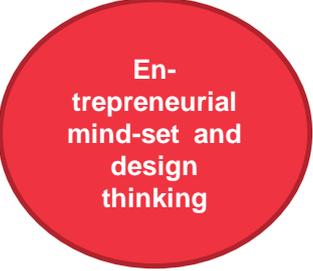
- University wide artistic courses (UWAS) are actively selected by our students through encouragement by our teaching personnel and by support in study planning.
- Students are actively participating in joint minor in CHEMARTS or take other e.g. design containing courses such as PackAge.

4. Mechanisms to enable creative practices

- Course contents and curricula are updated with creative practices in mind.
- Strong interdisciplinary network to increase the entrepreneurial mindset and design thinking of personnel.



Inter-
disciplinarity
for research
excellence



En-
trepreneurial
mind-set and
design
thinking



Excellent
visibility
through co-
creating
artworks



Educating game changers: Target state 2020

1. Attractive programmes

- Attractive and esteemed programmes by efficient marketing and highlighting the importance of school's educational areas in the future society (e.g. active role in STEAM activities). This requires also changes in the mindset of teachers.
- Active and truly joint programmes within Aalto University multidisciplinary areas with a special focus on entrepreneurship.



Attractive
and
esteemed
programmes

2. E-learning solutions

- Electronic learning methods in several courses and also electronic examination of large courses.

3. Success of students

- Students with good study progress (number of students with over 55 credits/year) through, e.g., meaningful feedback practices and tutoring to support learning and study progress.
- Solving the problems related to bottleneck courses that typically overload students.
- Highlight the importance of project and lab works on students' commitment.



Working life
skills through
collaboration
with employer
organizations

4. Working life competences

- Fluent collaboration with employer organizations in promoting students' working life capabilities.
- Highlighting educational collaboration with industrial partners.
- Enabling internships by, e.g., digital solutions and scheduling.



Motivated
students with
good study
progress

Actions 2017-2020

Strategic area	2017 spring	2017 autumn	2018	2019-
Research excellence	Publication working group AoF and EU training events	Publication workshop Process for evaluation of applications	Illustration courses	
Research environment		Preparing guidelines for usage of infra	Textile center with VTT Attracting new partners	
Research networks	Active role in Erifore and EIT actions	Top scientist visits	Arranging conferences International summer schools	
Innovation ecosystem	Active industrial advisory board according to annual clock	Principles of strategic partnerships agreed	Forming new partnerships	
Excellence (ART)	Continuation and development of CHEMARTS and PackAge	New multidisciplinary courses	Hosting Artist in Residence	Joint PoP
Visibility & impact		WWW and FB update Galleries in lobbies and Design corner in Bioproduct center	New industrial partners Virtual galleries	Joint glass workshop
Broader art-based offering	Marketing UWAS courses Marketing CHEMARTS minor	Study planning to support UWAS	New opening for multidisciplinary courses	
Mechanisms to enable creative practices		Collecting best practices and identifying obstacles	Updating course contents	
Attractive programmes	Active role in Aalto LUMA center Integrating multidisciplinary studies	Business and entrepreneurship embedded in curriculum	Participation in joint programmes	Collaboration with UH
E-learning solutions	Participation in Aole pilots	Learning from other Aole projects New electronic learning materials	Electronic examination	
Success of students	Identifying bottle-neck courses Ensuring motivating lab courses Academic advising instructions	Clear plan to improve study progress Lab courses for students outside CHEM Feedback practise instructions		
Working life competences		Joint understanding of internships with industry Scheduling of studies	Digital solutions	