

External evaluation of research activities at University West

Evaluation unit: Department of Engineering Sciences
(KAMP-PT, Computer Science, Electrical Engineering)

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Introduction

The assessment group comprises three subject experts and one PhD student representative, with core expertise in fields of research of relevance for the evaluation. The group also holds significant experience in running large research efforts, provide general expertise in engineering science with prior experience in evaluating research proposal, research programmes and institutions.

The work was organized in three stages. First, the evaluation group was given access to the self-evaluation report and the publication report from the department. These documents formed the basis for in-site interviews held on 21-22 August involving meetings with research group leaders, department management, young researchers and PhD students. The evaluation group could also visit the relevant laboratories (PTC at Innovatun, Computer Science Laboratory at Main Campus and Electrical Engineering Laboratory at Stallbacka). The evaluation group co-produced the draft evaluation report, whereafter the chair of the evaluation group refined this draft for common approval of the contents. This constitutes the current report.

Summary reflection

The Department of Engineering Sciences demonstrates a robust and consistent research output, marked by strong co-publication with industry and significant international engagement. The department's strategy effectively aligns research with industrial and societal needs, supported by advanced research infrastructure and a commitment to multidisciplinary development. Notable strengths include a high level of collaboration with core industrial partners, a resilient publication record, and a proactive approach to integrating research and education.

However, the department faces several challenges that could impact its long-term sustainability and growth. These include a reliance on a limited number of industrial partners and funding sources, uneven distribution of research activities and resources across groups, and persistent gender imbalance in senior roles. There is also untapped potential for broader interdisciplinary collaboration, more inclusive seminar culture, and enhanced integration of sustainability and equality principles. A more detailed assessment is provided below, but here is a summary of the main areas identified for development:

- **Strengthening publication and funding strategies**
- **Broadening industrial and academic collaborations**
- **Enhancing interdisciplinary and seminar culture**

- **Improving gender balance and career support, and**
- **Advancing sustainability and infrastructure planning.**

Assessment

1. Publications

The Evaluation Unit has a documented publication strategy where research results are published with peer review. The research may also have been presented as full publications (more extensive extended abstracts) at national and international conferences with peer review. Regardless of the forum, the publication should be characterized by a high citation rate.

The assessment group's analysis:

Strengths:

Overall, the engineering department has a high and consistent publication output. Over the period from 2018 to 2024, the department produced a total of 821 publications, maintaining a steady output each year with annual totals ranging from 98 to 133 publications. Most of these outputs were journal articles, which highlights a strong emphasis on peer-reviewed research within the department. This consistent focus on publishing in scholarly journals demonstrates the department's commitment to contributing to the academic community and ensuring that its research meets rigorous scientific standards.

The department also demonstrates strong international and national collaboration, with international cooperation being particularly prominent through partnerships in countries such as India, the United Kingdom, Canada, and Germany. National collaborations, especially with Swedish universities and companies, have also shown resilience, rebounding after a temporary decline in 2021–2022. Several of the publications have been made together with the industrial partner GKN Aerospace.

In terms of open access, 56.6% of the department's publications are openly accessible, and this proportion has increased steadily over time—from 41.3% in 2018 to 60.9% in 2024—thereby supporting greater visibility and accessibility of research outputs. The department's research is also impactful, as evidenced by several highly cited publications, particularly in areas such as additive manufacturing, materials science, and manufacturing technology. Citation counts have grown significantly year-on-year, especially in major databases like Web of Science and Scopus, indicating increasing influence in the field. Furthermore, the department's publications span a wide range of subject areas, including

engineering, materials science, physics, computer science, and mathematics, reflecting a multidisciplinary approach and broad expertise.

Weaknesses:

A strategy exists at both departmental and group level but is not yet gathered in a single formal document. Consequently, the work to bring this into operation is a key for targeted efforts to increase the number of publications in top-tier journals and in strategically important subject areas. Additionally, although open access rates have shown improvement over the years, there is still considerable room for growth to fully meet national and international open science requirements.

Another concern is that most publications originate differently from the research groups within the department. This variation in publication activity reflects group size and maturity. Still, the diversity of perspectives and expertise represented in the department's overall publication profile can be further addressed to help strengthen the department's academic output and opportunities for broader dissemination and engagement with new research communities.

It is also important to note that, among industrial partners, GKN is the only one explicitly mentioned in the publication data, while the department do engage as evident from the interviews strongly with other companies, which should be possible to transform into productive co-publication.

Another possible weakness is underutilised potential for interdisciplinary collaboration, as much of the research activity remains concentrated within specific subject areas and research groups rather than spanning across different fields.

Opinion:

The Department of Engineering demonstrates robust research productivity, strong collaboration networks, and increasing impact through citations and open access. However, the absence of a single format publication strategy and uneven distribution across research groups and subject areas suggest untapped potential. Strategic planning and targeted support could further elevate the department's research profile, especially in high-impact journals and emerging fields.

Recommendations:

To strengthen the department's research profile, it is recommended to develop and implement comprehensive publication strategy by unifying the strategies at research group level and at department level. This should include clear goals for publishing in high-impact journals and engaging with critical scholarly communities.

Enhancing open science practices is also essential, with a strategic focus on increasing open access rates and providing researchers with training and support on open science principles and compliance.

Diversifying publication types and outlets by exploring new and interdisciplinary subject areas will help broaden the department's research impact. Collaboration

and networking with industrial partners also involved in publications should be further strengthened by fostering partnerships that align with research priorities to ensure resilience and relevance and a great ability to create impact.

Finally, it is important to ensure that all research groups are actively involved in publication development and strategy implementation, supported by resources such as writing workshops, mentoring, and editorial assistance to boost both output and quality.

2. Financing

The Evaluation Unit has a documented funding strategy, i.e. a long-term plan for external funding. There is a system for internal quality review of applications before they are sent to external funders, and the approval rate is good.

The assessment group's analysis:

Strengths:

The Department of Engineering Sciences has established a documented funding strategy, with a clear long-term plan for securing external funding. This strategy is actively implemented across research groups, and there is a strong institutional focus on diversifying funding sources, particularly by increasing applications to EU framework programmes and national agencies such as Vinnova and the Swedish Energy Agency. The department has developed robust internal quality review processes for funding applications, including peer review, critical input from the Grants and Innovation Office, and strategic alignment with funding agency priorities. These processes contribute to a consistently good approval rate for external funding applications, with several years meeting or exceeding the target of less than 50% dependence on the Knowledge Foundation (KKS). The system also supports continuous improvement, with annual follow-ups and feedback from KKS, and provides researchers with training, templates, and administrative support to enhance the competitiveness of proposals.

Weaknesses:

Despite the strengths, there remains a high degree of dependence on the Knowledge Foundation (KKS) for external funding, with the share exceeding 50% in 2024. This reliance poses a strategic risk, as changes in KKS priorities or funding levels could significantly impact the department's financial stability and research capacity. While efforts to diversify funding are evident, the proportion of funding from EU programmes and other national agencies is still relatively

modest. The approval rate for applications has declined in recent years, both in terms of number and amount, suggesting increased competition or challenges in proposal quality. Additionally, some research groups face difficulties in engaging senior researchers in funding applications, and there are challenges in long-term planning for doctoral student funding and career development. The system for internal quality review, while robust, could benefit from further formalization and broader participation across all research groups.

Opinion:

The Department of Engineering Sciences demonstrates a mature and proactive approach to external funding, with clear strategic ambitions and well-developed support structures. The documented funding strategy and internal quality review system are effective in maintaining a good approval rate and supporting research excellence. However, the high interdependence on KKS remains a vulnerability, and further diversification of funding sources is needed to ensure long-term resilience. The department's commitment to continuous improvement and capacity-building is commendable, but greater efforts are required to engage all research groups and senior researchers in the funding process, and to address structural challenges in doctoral training and career development.

Recommendations:

To strengthen the funding strategy and quality review system, the department of engineering should intensify efforts to diversify external funding sources, with a particular focus on increasing the share of EU and other national agency funding. This may involve targeted support for interdisciplinary and international collaborations, as well as strategic investments in proposal development for large-scale projects. The internal quality review system should be further formalized and expanded to ensure consistent participation and feedback across all research groups. Special attention should be given to engaging senior researchers in funding applications and to developing long-term plans for doctoral student funding and career progression. Finally, the department should continue to monitor approval rates and funding trends, using bibliometric and financial analysis to inform strategic decisions and resource allocation.

3. Personal

The evaluation unit has a critical mass of researchers and doctoral students with PhDs and a high proportion of senior researchers (associate professors and professors) measured in full-time equivalents. There is enough senior expertise to conduct their own research and supervise doctoral students. There is a plan for skills supply, which is followed up and used. The research groups are characterized by diversity and equal gender distribution.

The assessment group's analysis:

Strengths:

The evaluation of the staffing and researcher composition within the department shows that it overall possesses a solid critical mass of researchers and doctoral students, with a high proportion of senior researchers such as associate professors and professors measured in full-time equivalents. There is sufficient senior expertise to independently conduct research and supervise doctoral students, and that the number of professors and associate professors has remained stable or even increased in recent years. This provides a strong foundation for research quality, continuity, and academic renewal. The department of engineering also has a documented plan for skills supply, which is actively followed up and used in practice, supporting both generational renewal and strategic recruitment. There is evidence of diversity in academic backgrounds and research expertise across the groups, and some progress has been made in increasing the proportion of women among associate professors and researchers.

Weaknesses:

Despite the overall strength in numbers, some research groups remain very small, which makes them vulnerable to staff turnover and limits their long-term sustainability and ability to renew themselves. The gender distribution, while improving among associate professors and researchers, remains heavily male dominated at the professor level, with no female professors recorded in recent years and an overall low proportion of women in leading roles. This persistent structural imbalance is a significant challenge for the department of engineering. Furthermore, certain groups lack junior researchers and doctoral students, which may limit their capacity for renewal and future growth. Due to seize and lack of “junior faculty” some groups are at risk of becoming isolated or overly dependent on a few key individuals. The plan for skill development would be strengthened by more actively involving group leaders in its implementation and follow-up. Additionally, the absence of a formal mentorship program for junior faculty is a notable gap.

Opinion:

The Department of Engineering Sciences is well-positioned in terms of senior expertise and critical mass, providing a strong platform for high-quality research and doctoral supervision. The existence and active use of a skills supply plan is a clear asset, supporting strategic development, continuity, and generational renewal. However, the uneven distribution of staff across groups and the ongoing gender imbalance—particularly the lack of women in senior roles—highlight areas where further progress is needed. Small groups, especially those lacking junior faculty, require targeted support to ensure their sustainability and to avoid overdependence on a few individuals. Additionally, the plan for skill development would be strengthened by more actively involving group leaders in its

implementation and by establishing a formal mentorship program for junior faculty. The lack of integration between some research areas, such as computer science and production technology, also suggests untapped potential for interdisciplinary collaboration and synergy.

Recommendations:

To further strengthen the staffing profile and research environment, it is recommended that the department prioritizes the growth and renewal of smaller research groups, ensuring they have the resources and support needed for long-term viability. Efforts to improve gender balance should be intensified, especially at the professor level, through targeted recruitment and career development initiatives. The skills supply plan should be actively monitored and adapted to address emerging gaps, with particular attention to succession planning, the recruitment of junior researchers and doctoral students, and the more active involvement of group leaders in its implementation. Establishing a formal mentorship program for junior faculty and promoting diversity in all forms—gender, age, and academic background—will help build a more resilient and dynamic research environment, while fostering stronger integration and collaboration between different research areas will further enhance the engineering department's capacity for innovation and impact.

4. Quality review and peer review

The Evaluation Unit has a structured and systematic approach to reviewing the quality of research efforts through a peer review procedure. There is an active academic seminar culture with high participation from researchers and doctoral students within and outside the evaluation unit, where research is followed up collegially and researchers/doctoral students receive feedback on their performance.

The assessment group's analysis:

Strengths:

As pointed out previously, the department has established a structured and systematic approach to reviewing the quality of research efforts, primarily through a formalized peer review procedure when writing research applications. Regular meeting is held within research groups with clear expectation that both senior and junior researchers participate in these activities. Further, PhD students follow an established process with regular follow-up on their performance and development.

Weaknesses:

However, while the formal peer review for research funds and quality assurance systems for PhD students is well established, there are several weaknesses. Besides having formal seminars related to the PhD students process there is a lack of regular higher-level seminars and an underdeveloped seminar culture across the different groups in the engineering department. There is a lack of regular, higher-level seminars that go beyond the formal requirements for PhD students, and meetings within research groups often do not prioritize peer review of each other's work. This results in limited participation from researchers and doctoral students outside the core groups, and there is a clear absence of a cross-group seminar tradition that could foster interdisciplinary dialogue and intellectual exchange. Furthermore, the robustness of the feedback culture varies between groups, meaning that not all doctoral students and early-career researchers benefit equally from collegial follow-up and academic discussion. Overall, while the foundation for quality assurance is solid, the department would benefit from a more vibrant and inclusive seminar culture that encourages broader participation, cross-disciplinary engagement, and a more consistent approach to academic feedback and peer review.

Opinion:

While the department has made significant progress in establishing a structured and systematic approach to quality assurance—particularly through formalized peer review procedures for research applications and regular follow-up processes for PhD students — there are still notable shortcomings in the broader academic culture. The current system ensures that both senior and junior researchers are engaged in regular meetings within their respective groups, and that doctoral students receive consistent feedback on their progress. However, the seminar culture across the department remains an area for further development.

Recommendations:

It is recommended that the department builds on its existing strengths by formalizing and expanding the academic seminar culture, making it a regular and integral part of all research groups. This could involve establishing cross-group seminar series, inviting external speakers, and encouraging participation from researchers and doctoral students across the entire department. Additionally, efforts should be made to ensure that feedback and collegial follow-up are systematically provided to all researchers, regardless of group size or disciplinary focus. By establishing an active and dynamic seminar culture, the department can further support interdisciplinary collaboration and open for new avenues of research.

5. Connection between research and education

There is integration between research within the evaluation unit and education at undergraduate, advanced and/or doctoral level. Research results and innovations are integrated into teaching, and students are given good opportunities to participate in research projects and be supervised by experienced researchers.

The assessment group's analysis:

Strengths:

The integration between research and education within the evaluation unit is well established at undergraduate, advanced, and doctoral levels. Research results and innovations are actively incorporated into teaching, and students are given meaningful opportunities to participate in research projects and receive supervision from experienced researchers. All research groups are closely involved in program leadership, course delivery, and student supervision, ensuring that education remains closely linked to current research and industrial relevance. Master's and bachelor's programs are regularly updated to reflect the latest research developments and exposure to real-world examples. The department of engineering has also been successful in working with competence development for professionals, where the latest research contributes directly to upskilling and reskilling initiatives.

Weaknesses:

Despite these strengths, the level of integration and student involvement varies across research groups. Some groups, particularly smaller or newer ones, have limited capacity to involve students in research projects or provide consistent supervision from senior researchers. There are also disparities in how research outcomes are incorporated into teaching, with some programs and groups more advanced in this respect than others. Notably, some research groups are rarely involved into teaching programs while others particularly smaller groups are responsible for running and supporting several programs, which can stretch their resources and limit their ability to provide deep research-education integration.

Opinion:

Overall, the department demonstrates a commitment to integrating research and education, providing students with valuable opportunities to engage in research and learn from experienced faculty. However, to fully realize the benefits of this integration, it is important to address the uneven distribution of resources and expertise across groups, and to ensure that all students—regardless of their program—have the opportunity to learn from and participate in cutting-edge research. The fact that some groups are very limited involved into teaching

while others, often smaller, must support several programs highlights a need for more support.

Recommendations:

To further enhance the integration between research and education, the department should ensure that all research groups—regardless of size or maturity—have the capacity and support to involve students in research projects and that all groups need to have a basic level of activities in research. This could be achieved by allocating targeted resources to smaller groups, encouraging collaboration across groups, and developing structured opportunities for students to participate in ongoing research projects that is led by other research groups but that could be strengthened by students from other programs.

6. Collaboration with the surrounding community:

The researchers in the evaluation unit collaborate with the surrounding society, such as companies, authorities and organisations for mutual knowledge exchange and knowledge production. Collaboration with external parties contributes to higher quality in research and to the renewal and development of research.

The assessment group's analysis:

Strengths:

The KAM-PT environment as well as the Electrical Engineering and Computer Engineering environments present a well-developed collaboration with surrounding community. The co-operation has mostly a strong industrial base and relevance and it is distributed among the research groups related to their networking. Measures depicting academia-industry collaboration include co-publications and rankings. The self-evaluation report and presented publication data show co-publications with industry of about 140 (DIVA) for 2018-2024. As a comparison, the total number of journal papers reported for the same period amounts at 591, indicating co-publication relation to total journal publication at around 24%. The basic support via KKs platform has promoted the collaborative at the department and it can also be concluded from the report and interviews that this effort expands from research to education and in this manner back to contract education and thematic outreach events for strengthening co-operation and attracting broadened co-operation.

The external co-operation and networking at KAM-PT is clearly related to manufacturing industry related to the manufacturing technologies in focus at KAM-PT. The co-operation and networking at Computer Engineering (CE) and

Electrical Engineering (EE) extends to other companies and sectors in society such as software companies, cyber security in case of CE and towards energy, power and transport sectors connected to energy transition and electrification. These fields add new areas of academia-industry collaboration and outreach of relevance.

The department thus presents a well-developed co-operation strategy towards industry and society, which is also reflected from the interviews with different groups. A particular strength lies in the capacity to address industry-relevant problems and integrate these into the strategic research agenda and this seems to a strategy that is sought as well in newer areas as Computer and Electrical Engineering. From the interviews, it is clear that there are research leaders with capacity to drive the co-operation in their respective fields. There are well-developed links with core industrial partners as GKN Aerospace, Defense Industry, ESAB as well as Volvo Cars, Polestar and software companies.

Weaknesses:

The strength documented via close and strong co-operation with number of companies in selected areas constitute at the same time, if any, an implicit possible weakness. There is today rapid change in manufacturing technologies. In some sense, to address this, the full potential of strengthening internal co-operation between research groups and topical areas is not evident from reports and interviews.

Opinion:

There is a clear strategy to enrol with industry to realise co-operative efforts. From a funding perspective, this is also where University West is well positioned to build its research activities at KAM-PT, Computer Engineering and Electrical Engineering. The KKS platform is a foundation for this effort at KAM-PT, while the two other areas need to rest on other initiatives and other partnerships. The diversion can be considered as weakness, but this is also a way forward to develop new co-operations. Notably, from the interviews with research leaders it could be envisaged that the internal co-operation is still not perfected to be able to address large scale co-operative projects in addition to the existing KKS platform.

The competitiveness and attractiveness are very much connected to the investments and capacities in research infrastructure and it is of course of outermost importance to develop this in balance with future needs and collaborative efforts.

Recommendations:

It is recommended that the department sets up targeted seed projects to promote new actions between groups to foster capability to expand external co-

operation. Basic for this is the collaborative model that seems to be an important part of the environment. One vulnerability is the dependency on co-operation with a few industrial stakeholders. There should be further initiatives to bring co-operations with selected industries as well as technology-driven SMEs in place.

7. Utilization/impact:

The Evaluation Unit has an ambition to transform research results into practical use and societal benefit, in the long and short term. The research results have an impact and contribute to shaping policy, industrial and business processes and the development of society.

The assessment group's analysis:

Strengths:

From the self-evaluation report and interviews, it is clear that the department (KAM PT, Computer Engineering, Electrical Engineering) has capability to transfer research results into use. This is reflected by the research areas established at KAM-PT as well as the strategies in adding Computer Engineering and Electrical Engineering to spin-off new areas to expand into new fields with societal benefits and impact. The ambition to develop research infrastructure, which is also relevant for education and academia-industry co-operation is a key fundament. As spin-off, start-ups are created (e.g. Procada in DED area), the joint laboratory with GKN is established and developed (adding to job creation), a laboratory that also attracts further companies to co-invest. The electrical engineering area follows a similar strategy in new facilities being developed off campus at Stallbacka, whereby close cooperation with industry on site is established with knowledge co-creation.

Weaknesses:

Given the circumstances it is clear that utilization of results are predominantly linked to the academia-industry co-operation in funded projects and via e.g. KKS platform. There are a few important examples of evidences of spin-off from research. Would there be any weakness, it is to explore how spin-off are established and how this can be further enhanced.

Opinion:

The academia – industry co-operation sets a foundation for utilization and potential impact of the research. As such, this a very good starting point which guarantees alignment of research with needs in industry and society. To balance this strong industrial context with societal needs in general is there but could be

further strengthened. It can be expected to be of increasing importance in rapidly developing areas to set up additional means to create impact.

Recommendations:

It is recommended that the department sets up targeted seed projects and actions to promote impact with transparent mechanisms to bridge in early stages of development of research.

8. Academic collaboration:

The Evaluation Unit has established strong collaborations and networks both nationally and internationally. Its researchers regularly participate in international projects, conferences and exchanges. There is an openness to integrating different perspectives and expertise from different parts of the world.

The assessment group's analysis:

Strengths:

The academic co-operation with external institutions in Sweden is focused to in particular to Chalmers, LiU and LTU. There is as well expanding co-operation with UU in the field of electrical engineering, for example owing to joint PhD school and enrollment of PhD students at UU. The KAM-PT environment has own examination rights. For Computer Engineering, there is also set-up with co-operation to secure enrollment of PhD students. In summary, the national collaborative networks appear to strengthen the scientific outcome and can be viewed as strategic important action by the department. Particular strength is upheld regarding international co-operation. This means for example that international co-operation is possibly stronger (45 joint publications in 2024) as that with academic institutions in Sweden (30 joint publications). Nevertheless, the self-evaluation report also depicts that number of co-operations within the department represented by number publications is extensive (>490 for the reporting period 2018-2024). The international co-operation extends to different parts of the world (Uk, Brazil, US, India, Germany) showing openness to connect to expertise across the world.

Weaknesses:

Again, having strong co-operation with a few important academic institutions builds long-term relations that should be valuable to develop research excellence and impact. This, however, adds vulnerability when it comes to enhancing new influences to develop and redirect research towards new areas when/if wanted.

Opinion:

The department has strong focused academic co-operation with number of selected institutions and research groups. This brings long-term stability, but also means that new influences may be less.

Recommendations:

It is recommended that the departments makes an overview of academic co-operations, both nationally and internationally and positions itself to develop academic co-operations. This will be of increasing importance as future funding system will honour cross-fertilisation of academic research in large scale projects across research environments and different universities. Also, there is interest to expand EU-funded research. The department should consider how this is best done (from its current position), to build on productive networks to make sure that researchers are invited on regular basis to increasing number of initiatives.

9. Infrastructure and support:

The Evaluation Unit has access to modern research facilities, equipment and technology needed to conduct state-of-the-art research. This can include laboratories, databases, libraries, and more to support research projects. The University's library and administration provide appropriate support to researchers to conduct high-quality research activities. This can apply to HR support, finance, communication, support in ethical issues, information management and more.

The assessment group's analysis:

Strengths:

The PTC infrastructure at INNOVATUM Science Park represents an asset of core importance. This has meant that the department has been able to position its research in manufacturing engineering with focus on number of topical areas. The strength in infrastructure is in particular evident regarding welding and weld-based additive manufacturing, but also in areas as thermal spraying and powder-based additive manufacturing. This is seconded by automation cell facilities and materials characterization laboratory (high resolution microscopy) and dedicated material properties testing (e.g. Gleeble, etc.). The co-creation and sharing of this infrastructure with industry (e.g. GKN Aerospace) is a perfect examples of bringing capacity for academia-industry co-operation in place. Also, in Electrical Engineering, related approach is developed elsewhere (Stallbacka) as well as in Computer Engineering (main Campus). A main benefit in all these cases is the close proximity in offering facilities for both research and education. An important means for having this infrastructure up and running is personell and a particular strength is the number of research engineers.

Regarding support, there is dedicated part-time communication officer connected to KAM-PT, which is important to promote the research environment.

Weaknesses:

Planning for long-term maintenance and renewal of research infrastructure is already integrated in KAM-PT and university-level processes. Still, to keep the infrastructure up to date requires significant funding to have it running and to renew with new equipment. This therefore always represents a challenge to provide research excellence in the experimentally oriented research at the department. The research leaders do develop their respective fields with infrastructure in line with the overall planning, and it seems from the interviews that there are department/research group interaction to foster this. However, it was clear from the interviews with the research leaders that even further efforts could be placed to link the different research groups interests.

Opinion:

It is not clear how the department will be able to maintain and develop its strong infrastructure. It is clear from the report and initiatives that the department has been successful and research leaders have the entrepreneurial capacities. However, this also means that the success of renewal and development correlates with research leaders' ambitions and possibilities. General support seems to be well in place from department level and the university.

Recommendations:

It is recommended that the department presents a plan for long term renewal of research infrastructure taking into account possible funding schemes (internal, external).

10. Research renewal and development

The Evaluation Unit continuously demonstrates a clear desire for renewal and development and has a good ability to identify new areas for research within the environment and together with other environments.

The assessment group's analysis:

Strengths:

The research renewal is very much connected to the agenda of the academia-industry co-operation. In terms of attracting grants for applied research this is an appropriate strategy. This also means that the research be challenge-driven and address primary societal challenges of importance for competence development, innovation and impact. With this should be possibility to address manufacturing engineering research related to sustainability, circularity and the

overall green transition taking place. The approach to develop Computer Engineering and Electrical Engineering adds to this capability and are important for research renewal connected to cybersecurity, AI/IT and manufacturing excellence in electrical drivelines, energy storage solutions, etc. The KAM-PT still provides a strong basis for the research.

Weaknesses:

To bring renewal in place with research excellence, it is important to have access to free money, either internal seed funding or external funding for basic research.

Opinion:

The basic research seems to be less established at the department. It can be argued for that this is at some level is crucial for research renewal.

Recommendations:

The basic research agenda in Sweden is today transforming with separation of technological science from natural science. Also, co-operation (academic and/or with industry) in even larger constellations appears to be a new paradigm. It is recommended that the department thoroughly analyse the new funding landscape and makes this an even stronger integration into its strategies with respect to topic areas, co-operations and long-term directions. It is again recommended that cross disciplinary co-operation as targeted in the self-evaluation is an active mechanism for renewal.

11. Freedom of research:

The Evaluation Unit safeguards and promotes the freedom and autonomy of research for its researchers. There are policies and mechanisms in place to protect researchers from political or commercial influence. This creates an atmosphere of creativity and exploration where researchers are encouraged to push forward innovative ideas and explore new areas without fear of reprisals or pressure.

The assessment group's analysis:

Strengths:

Despite the strong connection to industry and external funding, the self-evaluation report and interviews testify that the researchers are able to develop own research questions, methodological approaches, and paths for dissemination and publication. In practice, this means that the department sets maximum possible freedom of research given the funding possibilities and framework of applied research, which is the particular strength of the department. Hence, the

research is founded in academic integrity rather than full possibility for curiosity-driven research. The strong project base with trusted company partners enables going deeper in topic with time, since the trust seems to be strong and the tasks allocated may be more specific than those in more public projects.

Weaknesses:

From the interview with department management there seems to be seed funding mechanisms in place. However, from the interviews with the research leaders this was not evident. Even if there is great freedom within format of applied research done, there is a risk of projects to be validation of industry cases rather than free solution seeking.

Opinion:

There is need to pay attention on fraction of different projects. To change and implement more basic research would require strategies how internal funding is distributed and possibly incorporation of KPIs that promotes this to certain extent. Still, the question is still how this would impact further on the freedom of research for whole department. There could of course be targets to bring role models in place, but these needs to be carefully addressed.

Recommendations:

Try to increase diversity in public funding and plan and execute good balance between public and private projects to ensure freedom in research and increase in innovation. It is recommended that the department uses internal seed funding, if/when possible, to promote high risk research when researchers interest and strategic needs coincide. The proposal is that the ultimate scope should be to bring novel applied research in place.

12. Skills development and career support

Within the evaluation unit, there is support and mentoring programmes for doctoral students, newly defended and newly recruited researchers. This includes tutoring, training, and opportunities for professional development. The Evaluation Unit works actively to ensure the conditions for skills development. There is well-functioning career support for researchers at all career stages, regardless of the type of employment.

The assessment group's analysis:

Strengths:

The skills development seems to be embedded in the strategy and has extensive weight in the actions of the unit. The system seems to be also working well based on the information from the interviews.

The department presents how they work with career support for different categories ranging from faculty to early stages researchers, post-docs and PhD students. There are, in a broader sense, efforts in place to support the career development, but in particular the self-assessment describes a structured supervision system for PhD students and postdoctoral researchers, involving at least two supervisors per student. Interviewed PhD students are satisfied with this arrangement, as it provides support from multiple sources and offers insights from diverse perspectives. In addition, it gives researchers feedback and guidance on both research-related matters and career development, including publication strategy, networking, and grant writing.

Weaknesses:

The main potential weakness as also described by the self-assessment report is the lack of unified strategy, although the department aligns with the general policies and frameworks provided by the university. The follow up of PhD students appear to largely be connected to the action of research groups and their supervisors, while a more structured approach with annual meetings involving PhD student, supervisors and specially assigned director of studies is not implemented. The independent actions and problem solving are not mentioned in any document. The difference between units may be considerable, since the way of action is so different. Actually, the teaching units are not as well described in strategy as the research-oriented units.

Opinion:

The skill development and career support are well taken care of. There are strategies in place for career development and development of supervision including targets competence development and exchange activities. However, there is no unified strategy covering all categories in a structured way, and how this is done with management staff is unclear.

Recommendations:

Keep up the good work and try to develop even further, thus ensuring that the good way of action covers also the management. Another thing is to guarantee that the different units, being different by action, can also develop in equal ways. It is recommended that the department therefore introduces a unified strategy for career planning, competence development and supervision for all categories and implements, as well director of studies with special responsibility for PhD follow-up independent of the supervisor team.

13. Equality and non-discrimination

The Evaluation Unit promotes gender equality and non-discrimination through measures to ensure a balanced representation of gender and ethnicity among its researchers and leaders. There are active efforts to combat discrimination and promote equality, inclusion and diversity. A safe and respectful work environment is created where everyone feels welcome and appreciated for their contributions.

The assessment group's analysis:

Strengths:

University West has active gender mainstreaming plan which the department is fully committed to and aligned with. There is thus an awareness of and efforts in place to address equality and mitigate discrimination. Considering the challenge in creating gender balance in research field like production engineering it should be concluded that the department has the full awareness of needs and actions. Also, a high degree of diversity is promoted with high degree of internationalization among research leaders. The department is strongly multinational at the moment, this supports the culture to be based on typically English language in all levels, which makes the integration of foreigners easier and will help itself the equality.

Weaknesses:

Despite the efforts put in place there is a challenge in promoting gender balance and there could be further actions to promote this with e.g. novel recruitment strategies.

Opinion:

The department has reasonable situation based on multinational personnel which, in turn, is not necessarily helping the gender balance. Fostering gender balance may require novel strategies for research development and recruitment. The question arises whether recruitment strategies should honour broader recruitment without narrow definition of research fields.

Recommendations:

It is recommended that the department reviews its recruitment strategies to see if e.g. broader field openings would be a way forward to enrol established researchers or early-stage researchers promoting gender balance. The department may also try to improve the gender balance directly. This can perhaps be made by selecting females in higher positions whenever it can be justified. Having some high-profile female professors could help the situation. Currently

sustainability and material efficiency etc. are good for securing public funding and may attract the genders more equally.

14. Sustainability

The Evaluation Unit integrates sustainability principles into all its operations. There is an awareness of the environmental, social and economic consequences of the research and the effort to minimize negative effects. The research takes sustainability issues into account.

The assessment group's analysis:

Strengths:

The sustainability is clearly written to strategy. There is strong support for these issues by management and the personnel seem to be committed on this. The research targets topic areas of relevance for sustainability encompasses e.g. sustainable production and technology for electrification. The production technologies at KAM-PT are all of importance for realising re-manufacturing and circular solutions. In essence, department has different fields with competencies that complement one another to address cross-disciplinarity of importance to address sustainability. From the interviews it is clear that many projects do address sustainability through energy efficiency, circularity and re-manufacturing.

Weaknesses:

Although strategies appear to be well articulated, it is not clear how the research can contribute to measurable targets and KPIs. The systematic approach existing to take sustainability into account in research is not fully visible and number of related publications is bit low.

Opinion:

Sustainability seems to be at good level by the strategy, self-evaluation and interviews. How it reflected into education is unclear.

The ambition and scope to link and address sustainability in research are clearly there. The novel development in electrical engineering is an important initiative that progresses well and adds strengths. Still, even if the research on production processes at KAM-PT and materials/coatings has strong and evident sustainability dimension, it seems not to be fully motivated per se by sustainability aspects.

Recommendations:

The department has a research profile that can be further linked to sustainability and circularity in production and technological development. It is recommended

that this can be a merit to further develop strength in manufacturing engineering, computer engineering and electrical engineering.

15. Management

At the Evaluation Unit, there are prerequisites for good research quality through concentration of research time and predictability in staff planning.

The assessment group's analysis:

Strengths:

It is obvious that management is committed with support to different personnel groups. The communication between personnel groups seems to work well. The department presents a balanced approach to promote research quality and planning to enhance efficiency by time planning of teaching and research. The challenges are naturally different for different areas related to teaching load, but having a teaching base is also fundamental for upholding of connectivity between research and education and the strategy to make best possible combination is an appropriate measure. The objective of securing uninterrupted research time for researchers is an effective means of promoting research quality.

Weaknesses:

The weaknesses are mostly related to structural challenges. There are clear differences in critical mass between different groups. This may mean that the time for research and thus career development differs across the department. The requirements of education push the activities to certain directions, which is not necessarily the most obvious for the research activities. Lack of personnel capacity is decreasing the ability to react changes in activities.

Opinion:

Management works well. Some administrative guidelines and rules block the ability to grow in new areas and cause variation in activities. The differences in teaching and research between different groups do possess a challenge for the management to provide for equal possibilities to develop research. Naturally, research funding is the way to bring resources to increase the research time. Still, for groups having high education duties, this again presents a catch 22 situation. It is assumed by the reviewing committee that the department has proper and transparent measures in place to foster research development across the whole department.

Recommendations:

Figure out the funding for increased flexibility e.g. in personnel renewal situations.