



June 16, 2016

Prof Maria Knutson Wedel
Vice President
Chalmers University of Technology
Chalmersplatsen 1, 412 96
Goteborg, Sweden

Dear Maria,

I greatly appreciate that you were able to take time to meet Prof. John Hegarty and me for lunch on May 30 – the first day of the review of the External Visiting Committee for the Chalmers M-program. John is a new member of the committee and has a background that may be of interest to Rector Stefan Bengtsson, given the ambition to make Chalmers an even a stronger research led institution. John served a 10-year term as Provost (president) of Trinity College Dublin and led a dramatic improvement in the university research achievements and its international rankings. He also had to deal with significant budget challenges during his tenure so he has a sound perspective and understanding of Chalmers' ambition.

This letter provides a record of our Visiting Committee meeting on May 30-31, 2016 and this is the third meeting of the Committee.

Although not all members of the committee could be present due to schedule conflicts, the Committee members involved in this review were:

- Hans Björnsson, Stanford University (previously a professor at Chalmers and MIT)
- Dan Frey, MIT via Video Conference
- Bill Harris, Science Foundation Arizona
- John Hegarty, (Provost Emeritus, Trinity College Dublin)
- Mats Nordlund, Innovation Advisory Partners Scandinavia

We prepared several slides to highlight our findings and recommendations and include them with this letter report. Before we present our findings, it is important to note that each member of the committee is impressed with the quality of the M-program and the students it attracts to Chalmers. We also note the passion and commitment of the M-leadership and faculty involved with this program remains impressive and it is determined to provide a world-class education. And, we had the impression that the program is building a stronger international student body at the Masters level and that should, over time, be recognized more broadly by talented students.

While we recognize and understand that the contributions of all of the faculty and staff were essential to the accomplishments of the M-program, it is important to commend Prof. Mikael Enelund, for his leadership and, to note, the enormous respect he has from the faculty and students. Clearly, his dedication and ambition for academic excellence is appreciated and admired by all. And, in our work with Prof. Enelund,

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Arizonans want a strong economy, a good education system, and the availability of high-quality, high-paying jobs. Science Foundation Arizona was formed as a public/private partnership to help with exactly that.

we found him to be truly committed to Chalmers and helping it to achieve even stronger recognition in Sweden and throughout Europe.

Some of the important accomplishments in the past 3 years include:

- Recognition across Sweden as the leading engineering program;
- A computationally intensive approach to mathematics education that is well integrated with the subsequent engineering courses and provides a framework for attracting more faculty to this important area;
- The money provided by the recognition of the quality of the program has been utilized well by improving the facilities and education opportunities for the students;
- The auto simulator in the lab and the unique advantage this provides Chalmers and its students;
- The new effort on electric drive trains to complement the significant experience with petrol based engines;
- New focus on ethics and compliance education which is especially timely, given the diesel scandal at VW and the importance of engineering students to be well prepared to also become R&D leaders, CTOs, and ultimate leaders of major companies;
- Strengthened education and research partnerships with industry.

Our recommendations to the M-program leadership team and university are presented, in full, in the attached presentation. The recommendations are presented in these three categories:

1. Opportunities for the program to develop as it is;
2. Adding new dimensions to develop the program for the future, and
3. Organizational/institutional support needed to maintain the program's current status, and to develop it further.

In addition to the points presented in the attachment, we would like to add the following items:

- We strongly recommend the investment in a composite laboratory for the students, given the rapid shift in essentially all industries to lighter, stronger materials.
- A new composite laboratory could provide a testing resource, perhaps able to leverage and complement the graphene work now led by Chalmers.
- Materials courses should be updated to leverage the possibilities enabled by the new lab and prepare graduates to lead the introduction of advanced materials into industrial practice.
- We encourage Chalmers to share the accomplishments of the M-program more broadly in the EU and its innovative approach to education that is "market and performance" based.
- Becoming a benchmark of European engineering education will require excellence in execution and resources – both human and financial but the value to the education of the student and the reputation of the institution will be ever more enhanced.
- Build on the ethics and compliance initiative, as it is important for the graduates and will strengthen Chalmers' brand.

- Leverage the program board, visiting committee, the program's achievement and other networks to attract top leaders and get their commitment to participate in the board, teaching and projects.
- Continue developing the very important PENN State/Chalmers capstone BSc thesis projects and explore replicating this model with other universities if adequate resources are available.
- Consider running a fraction of the faculty searches in a "best athlete" format by writing a broad announcement of the position opening without stipulating areas of specialization and having broad representation on the search committee.
- Increase the level of truly student-led initiatives on campus, possibly adapt a "sandbox fund" concept (sandbox.mit.edu/) wherein students are encouraged to apply for moderate sized grants and connect with mentors.
- Chalmers engineering would benefit by having at least 25% of the engineering faculty be women over the next 5-10 years (and ultimately parity). We were disappointed that there has been little progress in this area. This can be achieved by using carefully designed incentives.

Our final comment is to encourage overt recognition and reward for what has been accomplished by the M-program. The recognition of its excellence is hard won and to retain it, additional investment is needed to achieve the balance needed for a globally excellent program in engineering which we are confident you understand. We also suggest you consider offering – in addition – a matching fund to inspire and encourage faculty to develop highly competitive external proposals that will advance Chalmers considerably.

We thank you for your support and strong commitment to excellence across Chalmers.

Sincerely,



William C. Harris
Chair, External Visiting Committee for the Chalmers M program

cc:

- All members of the visiting committee
- Prof Johan Malmquist, Dean of education
- Prof. Mikael Enelund, Head of M- Program
- Program advisory board of the M-Program (via M. Enelund)