The Sustainability Institute at RIT

Introduction. The ability of our planet to sustain current environmental quality is threatened by a host of related factors, with climate change, population growth, and industrial development among the most serious. The latter represents the biggest challenge because it is simultaneously the mechanism by which quality of life is maintained and the environment further damaged.

In 1987, the United Nations World Commission on Environment and Development identified the grave and inevitable consequences that would result from a failure to change our industrial production, consumption, and development practices. Despite widespread agreement about the positive impact of sustainable production and consumption practices on industrial development, such practices have been narrowly implemented at best. Indeed, all indicators cited in the 1987 report have since worsened.

The most significant barrier to progress has been the absence of a multi-faceted, interdisciplinary, systems approach to solving seemingly intractable sustainability problems. Only a systems approach will produce globally optimal results, and without global changes, local optimization attempts by scientists, engineers, corporations, and policy makers are destined to yield marginal impacts—or worse, to produce further damage.

RIT’s Sustainability Institute. The Sustainability Institute (SI) at the Rochester Institute of Technology is an exciting and wholly unique initiative. The SI will play a major role in enabling the transformation of global industrial enterprises into sustainable systems. Unlike other organizations with “sustainability” in their titles, RIT’s SI will apply a systems approach to industrial optimization, simultaneously addressing material flow, energy utilization, clean production methods, market transformation, and societal, economic, and environmental factors. While other universities have created programs addressing various aspects of product development, green manufacturing, sustainable enterprise, and public policy as it relates to the environment, none have addressed the whole task of integrating industrial systems to achieve sustainable production and consumption. At RIT, the term sustainability will consistently imply such a systems approach to global problems.

A major element of the new Sustainability Institute at RIT will be comprehensive interdisciplinary PhD and MS programs. The unique vision developed by Nabil Nasr and his team for the SI program in Sustainable Production is an integration of a broad set of disciplines into sustainable system solutions. Therefore, the graduate programs and related research will be defined and delivered by collaborating faculty and staff across RIT (including CIMS), along with newly hired tenure-track and research faculty within the SI who are experts in their discipline and who share this vision.

The Sustainability Institute will undertake comprehensive interdisciplinary initiatives in education, research, and technology transfer that build upon a set of RIT’s strongest
academic programs and the internationally respected successes of the Center for Integrated Manufacturing Studies (CIMS). The SI’s primary outputs will be interdisciplinary curricula, research, and graduates that, unlike the single-discipline or niche programs of other organizations, will be prepared to effect meaningful change on a global scale.

**SI Faculty.** At the heart of the SI will be a truly interdisciplinary core faculty team devoted to a tightly integrated interdisciplinary curriculum and attendant applied research program. This team will work closely and continually with leading industrial organizations, government agencies, educational institutions, and other stakeholders to define responsive curricula and research programs. The core faculty will engage associated faculty from colleges throughout RIT to assist in these efforts.

**Academic Programs in the SI.** Faculty within the SI, in collaboration with faculty across RIT, will develop comprehensive PhD and MS programs in Sustainable Production that will educate students to serve as skilled change agents at all levels of government, ngo, and business enterprises. Graduates will have skills in life cycle assessment, environmental risk and impact assessment, and design for the environment; knowledge of corporate strategies for sustainability (e.g., pollution prevention, closed loop supply chain management, and environmental management systems); and government policies for promoting sustainability (e.g., extended product responsibility, eco-labeling, and multi-stakeholder engagement).

The PhD program will consist of six program tracks: sustainable product design and realization; environmental studies; industrial ecology; technology and policy; sustainable business enterprise; and renewable energy. Before focusing on a program track, students will complete a set of core courses teaching a holistic, systemic, multidisciplinary, and integrative approach toward achieving sustainable production and consumption.

Faculty within the SI, in collaboration with faculty across RIT, will also develop graduate certificate programs in various facets of sustainability that meet continuing education needs of business and industry partners.

In order to preserve and brand the SI’s unique approach to “sustainability,” the term and its cognates will be reserved for the interdisciplinary academic programs that are developed within and offered by the SI. While other colleges and departments will contribute coursework and faculty to the SI, all programs focused on sustainability will reside in the SI.

**Research.** The research initiative of the Sustainability Institute will be a natural outgrowth of strong applied research programs and infrastructure at CIMS, which conducts several million dollars of applied research and technology transfer annually in the sustainability domain. Over the past 10 years, CIMS has completed hundreds of projects with both domestic and international companies ranging from the small to the Fortune 100, as well as government agencies ranging from local to federal to
international. The CIMS reputation and experience will uniquely position the SI to lead the sustainability movement worldwide.

The Sustainability Institute will leverage currently existing programs within CIMS into groundbreaking interdisciplinary research by PhD students and their faculty advisors. These include the Systems Modernization & Sustainment Center (programs in material aging, life-cycle engineering, economic decision systems, asset health management); the National Center for Remanufacturing and Resource Recovery (programs in clean technologies, intelligent testing and diagnosis, logistics and policy, sustainable design for remanufacturing); the Sustainable Systems Research Center (programs in asset recycle management, reverse logistics, technology assessment and benchmarking); and the Center for Sustainable Energy Systems (programs in bio-fuels and hydrogen fuel cells), and the Pollution Prevention Institute. CIMS will continue to utilize these capabilities, and others, to support its extensive outreach and technology transfer programs.

Conclusion. The development of the Sustainability Institute at the Rochester Institute of Technology is inevitable; no other single institution can boast an academic program portfolio with the reach and complementarity of RIT’s nor the capabilities and reputation of a CIMS. By integrating this set of unique strengths, the Sustainability Institute will establish RIT as a first-in-class resource for global sustainability research and education.

**Proposed Actions:**

The following actions are proposed to form the SI and the academic curricula for the PhD and MS programs in Sustainable Production.

1. The concept of the SI originated in the successful R&D conducted over the past several years in CIMS. The SI, which will be formed immediately, will incorporate and develop further those CIMS R & D programs that relate to the sustainable system vision. Additionally, the SI will collaborate with and seek to incorporate the research of those RIT faculty members whose research agendas accord with the SI vision.

2. Nabil Nasr will be named **Assistant Provost for CIMS and the Sustainability Institute**, reporting to the Provost. As the leader and primary champion of the SI, the Assistant Provost will be responsible for achieving its goals. The success of the Institute, which will be measured by the quality of its academic programs and the robustness of its research portfolio, will derive in equal parts from the power of the Assistant Provost’s vision, expertise, and reputation and from his ability to collaborate with individuals and organizations across the university.

3. A faculty member with an established academic record, including experience in curriculum development, teaching, and research in Sustainable Production, will be identified as the **Academic Director of the Sustainability Institute**. The Academic Director’s first responsibility will be to lead a multi-disciplinary team in the definition and development of a PhD program. The team will be composed of representatives of the SI, including Nabil Nasr, and faculty members from those academic disciplines
that could integrate into the PhD curriculum and who share the SI vision. Once the PhD program is approved, the Academic Director of the SI will serve as the Director of the SI Ph.D. program.

4. The following selection criteria are recommended for the SI Academic Director:
   a. The Academic Director must share the SI vision of a systems approach to sustainability,
   b. The Academic Director must possess qualifications appropriate for a tenured position at the Associate or Full Professor level within his/her primary discipline at RIT. The Academic Director will be appointed to a tenured faculty position within the SI by the Provost in consultation with appropriate personnel throughout the Institute.
   c. The Academic Director must be an experienced and effective collaborator, capable of coordinating and leading faculty across the university to develop this multidisciplinary program.
   d. The Academic Director must have experience in the recruitment and hiring of top tenure-track faculty.
   e. The Academic Director will report to the Assistant Provost for CIMS and the SI. For the purposes of developing the PhD program, identifying associated faculty, and ensuring the program’s quality and integrative nature, the Academic Director will consult closely with the Dean of Graduate Studies.

5. Research Faculty on soft money and supported through the SI and or CIMS will be hired by the Assistant Provost and housed within the SI. Job descriptions and Plans of Work for Research Faculty will be developed by the Assistant Provost subject to review and approval by the Provost. Research faculty within the SI will be expected to collaborate with faculty and departments in other colleges, particularly in the development of coursework to be included in the curricula of degree programs within the SI.

6. The Assistant Provost for CIMS and the SI, in consultation with the Academic Director, can also hire tenure-track faculty members for the SI. Such hires again are contingent upon Job Descriptions and POW’s being reviewed by the Dean of Graduate Studies and approved by the Provost. Annual reviews for such faculty will be conducted by the Academic Director of the SI and measured against the original job description and annual updates of the original POW. The salary and annual evaluations for such faculty will be the responsibility of the Academic Director of the SI subject to the approval of the Assistant Provost. If the faculty member has some assigned responsibilities within any of the colleges, the appropriate department heads and/or deans will contribute input to the Academic Director of the SI for the faculty member’s annual evaluation.

7. Until such time as the SI attains a critical mass of tenured faculty members, in order to comply with Institute policies and governance processes, an ad hoc promotion and tenure committee for the SI will be composed of eight tenured faculty members, one each from the existing colleges of RIT. Each college representative on this
committee will be selected by that college's tenure committee from a list of three nominees presented by the dean of the college for staggered three year terms. This committee will be responsible for conducting mid-tenure and tenure reviews for each tenure-track faculty member of the SI in accordance with RIT policy and within the context of the original job description, updated POWs, and annual reviews of the faculty member by the Academic Director of the SI. The Assistant Provost for CIMS and the SI will fulfill the functions of a college dean in the promotion and tenure processes. Positive recommendations from the Assistant Provost should include letters of support from the Dean of Graduate Studies.

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