

CALL FOR PAPERS

SUNSTAINABLE DEVELOPMENT

In Engineering and Engineering Education

Ingenium Conference December 7, 2020, Cnam, Paris

With the support and participation of the European research project A-STEP 2030 – ERASMUS+¹

In 1987, the Brundtland Commission defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Thirty years after its adoption by the United Nations, the concept of sustainable development now stands solidly at the core of the thinking of most states and other international institutions, including corporations and engineering education programs (for example, the 2019 CTI “References and Orientations.” Nevertheless, it is not yet clear which “development,” nor whose “needs” are really at issue.

So-called “sustainable” engineering projects seem to take into account environmental, economic, and social impacts. But what is the outer limit of responsibility? Ideally actors ought to be omniscient, polyvalent, and transdisciplinary, capable of analyzing the life and death cycle of an object within a planetary framework. Yet what form of organization can meet this ideal? Within which “system” (ecosystem, work collective, material and energy flows, etc.) can sustainable engineering be operational, practical, and scientific?

Even if technologies are capable of extending our cognitive limits, it is impossible to deny that in the epoch of the “great acceleration,” our awareness of resource limitations is also growing. The near future will clearly need to confront limited stocks of energy, raw materials, minerals, rare earths, inhabitable and cultivatable lands and water. We will also have to learn how to deal with pollution of all types, including aquatic, telluric, and atmospheric. Likewise, we will have to grapple with responding to the evolution of the climate and the loss—or even the collapse—of biodiversity (some have evoked the specter of a 6th mass extinction event). The fundamental challenge is to preserve desirable, acceptable, and livable options for the future. Can we take into account the long-term? Are we in solidarity with future generations?

¹The A-Step 2030 project (**Attracting diverSe Talent to the Engineering Professions of 2030**) is part of ERASMUS +: Strategic partnership between European higher education institutions supporting innovation in the field of engineering education (including ENSTA Bretagne, member of Ingenium).

How is sustainable development integrated into the training and professional practice of engineers? Is it an independent subject or concentration, an object of study, or a “thing”? Does the word sustainability refer to a univocal practice? Is “sustainable development” an oxymoron or a polysemic syntagma, used in highly divergent ways and regrouping a heterogenous set of convictions, practices, and institutions? What are the stakes that it raises? What debates does it prompt? Which social projects and public and private interests does it impact?

We will approach these questions, without pretending to exhaustiveness, through the prism of the economic and social activities of the engineer, in the context of heavy industries (nuclear, chemical, extractive) as well as in activities linked to sanitation, health (pharmaceuticals, hospitals), the environment (agriculture and industry), as well as security (police, military, transport).

We will also consider how engineering schools are integrating sustainable development into their curricula, both in terms of specific contents (corporate social responsibility, engineering ethics, social challenges or eco-design) as well as in terms of a general re-orientation of all disciplines around the challenge of sustainable development.

Communications can present research (results, projects underway), personal experiences or industry testimonials, original pedagogies, personal reflections...The presentations are expected to fuel debate. They will be organized around four workshops (see the following page for a presentation of the workshops).

- 1. Getting Involved in the Transition**
- 2. Thinking Sustainability**
- 3. Interculturality and Sustainable Development**
- 4. Educating for Sustainable Development**

Guidelines and Deadlines for the Call for Papers

Abstracts of 200 words maximum accompanied by not including the name of author(s), institution(s), 5 keywords, 3 or 5 references are to be sent by February 7th 2020 (*in Word, 12 point Times New Roman, 1.5 spacing*). Notification of acceptance/refusal by the INGENIUM review committee will be issued by **April, 3rd 2020**.

Those whose submissions are accepted will be expected to send in a final text of maximum 15,000 characters by September, 25th 2020 (*in Word and Pdf, including spaces, notes, and bibliography following APA guidelines, in 12 point Times New Roman, 1.5 spacing*).

The abstract as well as the final text are to be sent, *in Word and Pdf format*, to secretariat@reseau-ingenium.fr

The conference will take place on **December 7, 2020** at Cnam, Paris. Authors will be allotted 20 minutes for an oral presentation followed by a workshop/debate.

Abstracts and full-text contributions will undergo a double-blind peer-review procedure. All of the contributions that are presented during the conference will be published online. Selected articles will be published in a special issue of scientific journal.

Thematic Workshops

“Sustainable engineering” is a broad thematic. We have chosen four more focused questions.

1. Getting Involved in the Transition

How can we imagine and accompany a passage from competitive growth-oriented model to a system valorizing energetic sobriety and controlled growth? What can be retained from our past experience in order to build a new paradigm that integrates human, social, economic, and environmental concerns? How do we define transitional educational contents? How can we envision a transition that is at one and the same time progressive and rapid? How can the costs and benefits of that transition be distributed equally? Are there strategies that meet these needs?

2. Thinking Sustainability

What are the key principles behind environmental management and sustainable activities? How can sustainable development be aligned with economic performance and viability in engineering projects? Can programmed obsolescence, short-termism, and the acceleration of the rhythms of production and consumption be made sustainable? What are the key elements in a “sustainable” human society?

Which economical, technical, and conceptual approaches might permit the integration of multiple time horizons (from short-term to longest-term) into our thinking and actions? What research needs to be done? How can the social sciences help us to think about these questions? How can we become more aware of issues linked to sustainability, resource usage, renewal, and access? How can we build the means to measure sustainability?

3. Interculturality and Sustainable Development

Sustainability is a globalizing concept calling upon universal values, but it seems to be interpreted differently by different cultural contexts in light of divergences of their hegemonic economic, industrial and sociotechnical models. What are the different approaches to sustainable development? What role do our representations play in interpretations of sustainable development? Is it possible to create models of sustainable development that are legitimately plural, sensitive to North-South divisions, cultural differences, and concerns about environmental injustice?

4. Educating for Sustainable Development

Confronted with the need to preserve both natural resources and the biosphere, what skills need to be developed? What knowledge needs to be transmitted? How are students, teachers, and schools putting sustainability thinking into practice? Are any innovative programs or projects to be found on campuses? Is learning to develop sustainability akin to opening up engineers to a new political or professional conscience? What are the intersections between sustainable development and pedagogical innovations? Is sustainable development a form of knowledge? Or a know-how? A transdisciplinary approach? A stance?