

# GreenTech in Mechanical Engineering

## Terms of Reference for Research – Call for Tenders

### BACKGROUND

What we have seen in the years 2020 and 2021 so far is that COVID obviously serves as catalyst for imminent changes in several areas:

- Digitalization
- Energy Transition
- Mobility
- Need for “Green Growth” and green recovery

IndustriALL and FES are focusing with this research on the developments in the area of **Green Technologies (GreenTech)**. With this, IndustriALL is referring namely to all technologies in the sector of Mechanical Engineering that are related to or contributing to specific SDG's (see below) as defined by the UN. With respect to GreenTech in Mechanical Engineering, the development is two-fold:

1. **“Green” production/manufacturing schemes and patterns** (SDG 9, 12) within the sector:
  - a. Environmental non-harming production (less CO<sub>2</sub>-output, “green” sourcing and raw materials, non-polluting production processes)
    - i. “Green” products (like maintenance-free or lubrication-free equipment)
    - ii. Mechanical engineering equipment that is produced with a low-emissions footprint (using digital twins or 3-d-printing in r+d and recycled or re-engineered materials and products to reduce raw materials consumption)
2. **“Green” products/output:** machinery and equipment (serving SDG 7, 12) delivered for other sectors
  - a. meeting the requirements of a cradle-to-cradle design (“green by design/default”)
  - b. contributing to green production (i.e., energy generating through bio-gas – turbines, wind energy generators, ...)
    - i. Wind or water or biogas power generation systems and turning systems that are low-intensive when it comes to maintenance and service and are created to being re-engineered and re-used, recycled.
    - ii. “Green” plants and installations that are created and delivered by ME companies: low-carbon installations in cement, glass, steel... manufacturing

The underlying trends are gaining speed; political and industrial players are referring to the SDG's (Sustainable Development Goals) as defined by the United Nations in 2015.



Source: <https://sdgs.un.org/goals> The 2030 Agenda for Sustainable Development

This is challenge and opportunity especially for the Mechanical Engineering sector that delivers tools and applications for other industries in order to make Green Technology happen. Mechanical Engineering delivers especially in the following areas/SDG's:

- **Goal 7 – Affordable and Clean Energy:** Mechanical Engineering creates, engineers and produces the machinery and technologies to provide for clean energies (wind, solar, biogas, water...)
- **Goal 9 - Industry, Innovation and Infrastructure:** Mechanical Engineering is at the core of innovation and industry, especially when developing and delivering industrial installations (especially in new/green industrial applications, i.e., carbon-low-emission cement plants or steel mills or power generation installations etc.
- **Goal 12 – Responsible Consumption and Production:** The “new” design of products and mechanical engineering equipment that works in a cradle-to-cradle design instead of cradle-to-grave (or “cradle-to-trash”).

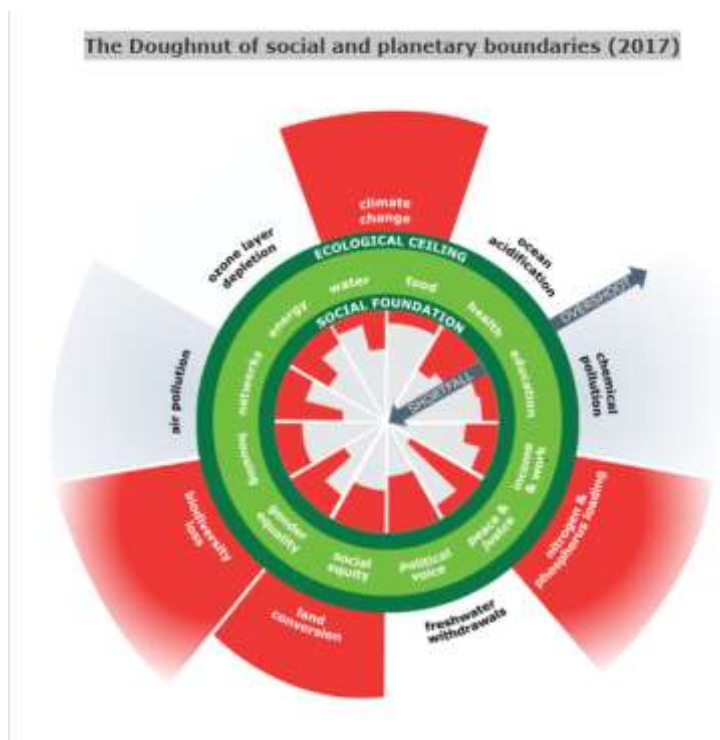
These goals are the most striking (but not exhaustive) examples. It becomes more and more obvious: This development is part of a broader change in the industrial and economic setup: One may argue that 21<sup>st</sup> century society will be a “*digitalized electric-electronical green market economy*”. Another important approach is the development of “Doughnut Economics” as described by Kate Raworth (see below). And to be clear: The actual crisis (partly linked to the pandemic) did not trigger but certainly accelerate the processes we describe above.

### What is already there?

Review over already existing knowledge in the organization that can be in parts used as framework for future research:

- GreenTech: In anticipation of the challenges linked to the climate change and the responses given by IndustriALL’s sectors, namely the Mechanical Engineering, IndustriALL Global Union has adopted the [GreenTech Manifesto 2020](#)
- Webinars: Webinar 2020 June: [Webinar I](#) : GreenTech Webinar 2020: [webinar II](#)

The concept of “Doughnut Economics” further drives discussions for a sustainable scheme of industrial production and services in the future:



Source: Kate Raworth <https://www.kateraworth.com/doughnut/>

## OBJECTIVES OF THE RESEARCH

Framework: This research is intended to have a clearly defined (and limited) output: we do not intend to “re-invent” a definition of GreenTech but to have a better understanding over the trends in “GreenTech in Mechanical Engineering”. With this knowledge, we aim to develop a strategic approach out of the research results that we are expecting. Following the internal discussion and follow-up IndustriALL wants to empower its affiliates to act in this segment following two pathways:

1. **Becoming active in organizing and recruiting** in the new/developing areas of GreenTech where they are not present yet (i.e., in the on-shore wind generator production in India, 2<sup>nd</sup> largest market and producer in the world)
2. **Adapting and/or developing (new) trade union structures** that are fulfilling the following conditions:
  - a. Welcoming the new (“green”) professions/workforce > being open and inclusive + being adaptive to the needs of these “new” employees
  - b. Being open for change and cooperation between and with (sometimes competing) trade unions in the area of GreenTech (or even creating new trade unions/sections within existing trade unions)

## EXPECTED OUTPUT FROM THE RESEARCH

Hence, what is needed, is a set of information describing the changes that GreenTech is driving forward in Mechanical Engineering in order to enable affiliates (and IndustriALL’ regions – represented in the Regional Offices) to respond appropriately. Also, the interconnectivity between GreenTech and digitalization (industry 4.0) needs to be clarified. The outcomes and research results will be used as training material and input in IndustriALL workshops and webinars covering this area. Specifically needed:

1. A (word) document that describes the systematic of GreenTech in Mechanical Engineering in order to give background and theoretical basis for trade union activities in the area.
2. A set of presentations (slides) to be used for training purposes in order to
  - Describe the actual situation and trends regarding GreenTech in Mechanical Engineering (employment trends, changing professions and production patterns)
  - Raise awareness among union leaders for GreenTech in Mechanical Engineering
  - Enable IndustriALL representatives to train own staff and affiliates’ staff to initiate the discussion and give inputs, also to steer the discussions in order to gather information about the questions and needs related to GreenTech in Mechanical Engineering.

## TOPICS THAT THE RESEARCH SHOULD COVER

Starting from a definition what GreenTech in Mechanical Engineering really IS (means), the researcher(s) have to cover the following issues and find (tentative) answers to the questions:

- **Sector in a change (and changing production patterns): How is the sector changing and what does that mean for workers’ rights and workers’ involvement – What is needed for workers and for trade unions in order to remain or become influential in this segment?**
  - What is Green Tech? Green technology as the combination of technical tools and solutions to minimize negative impacts of economic production on the environment and ensure sustainability development.
  - Global Footprint of Green Tech: main market trends and producers/companies and regions
  - Examples of green technologies: what technologies are we talking about?

- What leverages do workers/unions have to make the mechanical engineering MNC's sustainable and characterised by decent work?
  - Co-determination/workplace mechanisms (e.g., Learning Factory) - what is needed?
  - Education/ skills/ training policies and programs? What can trade unions do and what does "just transition" mean in this environment?
- Projection: future number of jobs? > How can we share the work in the future?
  - Employment effects – balancing the decrease of old technologies and the growth of new technologies
  - Less manual work, but different/new skills and working patterns – in how far do working relations in the GreenTech segment differ from traditional industrial settings in Mechanical Engineering?

## **METHODOLOGY**

The methodology will consist of the following elements:

- Desktop research over the general setting/stage of GreenTech in Mechanical Engineering (review and assessment of already existing research/knowledge in the area)
- Expert interviews with company representatives, employers' association representatives and workforce representatives as well as with trade union officials who are active in this area
- Compiling information gathered in concise (not too "scientific" or over-complicated high-technological wording) research report that can be used in the day-to-day training of trade union officials
- Developing/producing a set of presentations/slides delivering with respect to the above-described objectives

At the beginning of the work, a project-agenda will be set up (dates, milestones, controlling elements), with regular interaction between the researcher(s) and IndustriALL's director in charge.

A mid-term/interim report/presentation will be given at the next IndustriALL GreenTech virtual meeting in October 2021, the final documentation (report and presentations) will be handed over by early 2022

## **ELIGIBILITY CRITERIA FOR THE RESEARCHER(S)**

The researcher(s) need to have the following qualifications: It is important that the expert(s) have knowledge and sensitivity about labour issues, including fundamental rights, trade union work and structures. It will be a comparative advantage for the expert(s) to have contacts and links with national and international trade unions and relevant organizations working on these issues. This translates into the following requirements:

- Academic and/or student (either in the area of GreenTechnology or at least with some affinity to this area)
- Researcher/s should be academics with trade union background and experience preferred with additional profile with respect to GreenTech
- Knowledge of the (international) trade union system, and interest in strengthening workers' representation in new areas
- Capability to do
  - Desk-top-Research

- Interviews with trade union and company as well as employers' association representatives
- Capability to produce documents as required (in English), namely word document (report) and power-point presentations (training material)
- Excellent research and writing skills (in English) required
- The researcher/the research team must be able to conduct research and reporting as well as potential expert interviews in English; knowledge of reading German would be also welcome.

## **RIGHT OF USE**

IndustriALL, the Friedrich Ebert Stiftung who is supporting this research, and any third party will be entitled to reproduce the comprehensive report, the set of data and the presentations as a whole or in part and as often as required including the usage online.

## **DEADLINE FOR SUBMISSION OF THE OFFER AND BINDING PERIOD FOR THE OFFER**

Please submit your tender in English and in writing (via e-mail or postal mail) by July 15<sup>th</sup> 2021 12:00 o'clock (Geneva Time). Tenders received after this deadline cannot be evaluated. Your tender must be valid until at least August 1<sup>st</sup> 2021 (tender validity period).

## **AWARD CRITERIA**

The tenders are evaluated according to the following award criteria:

- Quality of the offer (70%)
  - The quality of the offer will be evaluated based on past products or services, level of knowledge as well as on how the expert plans to deliver the requested performance.
- Cost: (30%)
  - The cost offer will be evaluated by measuring the offered services against the price. The maximum budget for this research is 10.000 €, quotes will be measured by the best price/service ratio.

## **CONTENT OF THE OFFER (70%):**

Please submit together with the expression of interest in the tender cover letter (One-page maximum) the following information:

- Please provide a list of relevant researches you have conducted on GreenTech in Mechanical Engineering and two samples of these researches.
- Provide also information on other relevant activities (2-3 lines max/ each activity) that you have conducted (that are not researches or trainings) that can help evaluate your level of knowledge on GreenTech in Mechanical Engineering
- List of trainings you have developed and conducted on GreenTech in Mechanical Engineering or neighboring areas: Please provide a list of relevant trainings that you have developed and conducted on this or similar topics with trade unions. Please provide a sample of a training module you have developed. You can also provide a list

of additional trainings you have conducted with other social partners or Social Dialogue institutions (if any) on GreenTech and/or neighboring topics

- List of activities conducted with international or global labor movement
- Please provide information on relevant activities (2-3 lines max/ each activity) that you may have conducted with Global Unions, or with MNCs.

### **FINANCIAL OFFER (30%)**

Please provide a financial offer with a basis for calculation (e.g., 25 working days at 400 €/day). Please indicate your net price (i.e., excluding VAT).

### **GENDER DIMENSION**

IndustriALL Global Union strives to increase the number of female researchers and activists in academia, science, trade union education and activism. Applications from female researchers are therefore explicitly welcome. Applicants will be notified accordingly.

### **EXPECTED DATE OF AWARD FOR THE CONTRACT:**

31<sup>st</sup> July, 2021

If you have further questions, please do not hesitate to contact Matthias Hartwich at IndustriALL [mhartwich@industrialall-union.org](mailto:mhartwich@industrialall-union.org)