

The UN Sustainability Goals: The Role of FEANI / ENGINEERS EUROPE and the European engineering community



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This document summarizes the thoughts and views of FEANI/Engineers Europe, the European umbrella organization of 33 national engineering associations, representing more than 6 million engineers, on sustainability in general and on the UN SDGs in particular. It describes the role that engineering and technology, as well as engineering associations, can have in the achievement of these goals.



PREFACE

“Mankind is at a crossroads”. The historically versed reader will add the word “again” since the history of mankind is full of crossroads. Change is a historical constant, a universal truth. Now, in the third decade of the 21st century, we are once again at a point of great change in human history. However, this time, circumstances are somewhat different.

Firstly, we are facing a global challenge that affects each and every human on this planet, while prior developments, no matter how momentous, did always have limited impact. Secondly, this time we can witness the change on an everyday basis, due to the availability of global information and communication networks. Thirdly, the issue at hand is about nothing less than our very basis of life on this planet. By now, there is a widely accepted consensus that we as humans have been influencing natural cycles for decades. Our economic activities and negative side effects that come with it, did not only have localized impact. They also had an influence on natural processes on a global level. The effects are versatile. The average temperature in the Arctic is increasing. In addition, we witness periods of extremely high temperature followed by draughts and fires in some regions of Europe, Northern America, Africa, and Asia. At the same time, we also see periods of extreme rainfall followed by flooding and landslides. It has become obvious that continuing along this path is not an option.

One instrument developed to support counteracting the negative effects of human actions are the UN Sustainable Development Goals (SDGs). They provide a framework for action towards a more sustainable future for politicians, institutions, companies, organizations, and individual citizens. The European Federation of Engineering Associations (FEANI) as the voice of the six million engineers in Europe has made it one of its major tasks to strive for the achievement of the UN SDGs.

This paper aims at providing political decision makers, partner organizations, institutions, national member associations, and individual engineers with an idea of the role that engineering and technology must play in a way towards a more sustainable economy and way of life. This paper’s main goal is to instigate a change of mind. That is the first step. In addition, the paper will provide best-practice examples to function as blueprints for projects, events, and activities on a national and international level. Last but not least, this paper is a call to action. Achieving the UN SDGs will be a marathon, not a sprint. The engineering community is accepting its responsibility and stands ready to provide expert knowledge in all fields of engineering and technology. Engineers will have to play a vital role in making human society more sustainable. They are accepting this challenge with humility and dedication.

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On behalf of the FEANI WG SDG

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INTRODUCTION

The development towards a circular economy and a more sustainable way of life and an integrated approach to development that accounts for social, economic, cultural, and environmental impacts has been at the core of the national, European and global political discussions for many years. It has become clear by now that many of the challenges that come along with these goals, will require new approaches towards technical solutions. Engineers have always been playing and will continue to play an essential role when it comes to developing those solutions for society. In his welcome statement to the “Global Engineering Congress” 2018 co-hosted by the Institution of Civil Engineers (ICE) in London and the World Federation of Engineering Organizations (WFEO), UN Secretary General António Guterres, referring to the UN Sustainable Development Goals (SDGs), stated:

“Every one of the goals requires solutions rooted in science, technology and engineering.”

Developing and implementing those solutions will be a global and universal challenge. Solutions will have to be based on the cooperation of people from many different scientific backgrounds (including engineering), as the achievement of the UN SDGs means nothing less than a change of an entire socio-economic systems that have been established over the past two centuries.

Therefore, FEANI’s approach is to work together with partners from the business community, organizations, and institutions from different fields of science and political decision-makers. The overarching goal to which FEANI has committed itself is to go forward together to make a difference and help achieving the UN SDGs.

To make this mission more tangible, a FEANI working group on the UN SDGs took it upon itself to formulate an “action plan” at a meeting in Amsterdam, NL in July 2019. In this plan, the WG defined four forms of impact:

- **Organization impact:** integrate sustainable development in internal operations and practice of FEANI and the National Member Organizations
- **Members impact:** raise awareness and provide information/services on UN SDGs to the members of the FEANI National Member Organizations
- **External impact:** use knowledge and networks to lead the way towards a more sustainable way of life and shape the environments in which we are active
- **Activities impact:** deliver products/services and solutions to customers and partners that create value and drive innovation regarding the UN SDGs

Based on this, FEANI and its National Member Organizations (NMO) will:

- undertake activities to increase the general level of knowledge and of familiarity within the engineering community with the UN SDGs and the purpose they serve,
- develop joint activities within the FEANI community and with external partners from the business community and civil society (e. g. WFEO) to push the UN SDGs and
- start a dialogue with national as well as European decision-makers to include engineering associations and the engineering expertise they represent into discussions and decision-making processes around improvement projects on sustainable development.

Since the way towards truly sustainable societies requires changes in many ways, from individual behavior via mindsets of large stakeholder groups up to the restructuring of whole socio-economic processes, this will be a marathon, not a sprint. However, FEANI and its national member organizations will take up their responsibility and do their fair share to conserve this planet for future generations.

ABOUT FEANI

FEANI is a federation of professional engineers that unites national engineering associations from 33 European Higher Education Area (EHEA) countries. As such, FEANI represents the interests of over 6 million professional engineers in Europe while striving for a single voice for the engineering profession in Europe. It wants to affirm and develop the professional identity of engineers and through its activities and services, especially with the attribution of the EUR ING professional title, FEANI aims to facilitate the mutual recognition of engineering qualifications in Europe. FEANI, of which the Central Secretariat is based in Brussels, strengthens the position, the role and the responsibility of engineers in society.

FEANI was founded in 1951 by a group of French and German engineers who felt that through technology, their common field of activity, it would be possible to create links between former adversaries in order to facilitate a prosperous and peaceful development of the future European society. Associations from seven European countries immediately joined this initiative.

Today associations from 33 European countries, all belonging to the European Higher Education Area (EHEA), are represented in FEANI, bringing together more than 350 national engineering associations, all of which are recognized as the representatives of the engineering profession at national level. As such, FEANI brings together the cumulative engineering know-how and experience of numerous experts from all fields of engineering. It is a most competent partner for businesses, political decision makers and civil society partners on all topics of engineering and technology.

FEANI is also a founding member of the World Federation of Engineering Organizations (WFEO) and collaborates with many other European organizations dealing with engineering, technology and engineering education. Officially recognized by the European Commission as representing the engineering profession in Europe, FEANI also has consultative status with UNESCO, UNIDO and the Council of Europe.



ABOUT THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS (UN SDGS)

On December 25, 2015, 193 UN member states adopted the UN Agenda 2030 for sustainable development. With its 17 goals, the Sustainable Development Goals (SDGs), it represents the global reference framework for sustainable development. By adopting the agenda, the UNO member states have avowed themselves to jointly reaching the goals by 2030. All countries are called on implementing the Agenda 2030 along national strategies and plans.

The Agenda 2030 is an important milestone. It is the result of the consolidation of the UNO-conferences for sustainable development of 1992, 2002, 2012 and the millennium development goals that expired at the end of 2015. It also brought together the aspirations from the Kyoto Protocol for action on climate change and the Sendai Framework for natural disaster management, both expired in 2015. The Agenda 2030 is the globally effective framework for national and international efforts for the joint solution of the big challenges in the world, e. g. extreme poverty, climate change, destruction of the environment and health crisis.

The Agenda 2030 applies to all nations – in the north and in the south – and defines the priorities for a sustainable development by 2030. This commitment to universality meant a paradigm shift, which is based on the understanding, that the global challenges can only

be dealt with in a sustainable manner, if all countries contribute on the national and international level.

The 17 goals for sustainable development with their 169 sub-goals are at the heart of the Agenda 2030, which envisages the three dimensions environment, economy, and society in a balanced manner. The goals are further divided into the five driving principles People, Planet, Prosperity, Peace, Partnership (the “five Ps”). The intention of the Agenda 2030 is to ensure human wellbeing, economic development, protection of the environment and includes aspects like peace, the rule of law and good government, which are essential for a sustainable development. The cooperative realization of the agenda has been fixed as the fifth principle. This makes clear that the achievement of the Agenda 2030 is a process of society. All players in society can add to a sustainable development.

On the international level, the UN member states have agreed to account for their national progress in regular reports. The reporting is to the High-Ranking Political Forum for Sustainable Development, that takes place as part of the meetings of the UN General Assembly and the UN Economic and Social Committee. The committee accompanies and monitors the implementation of the Agenda 2030.

SUSTAINABLE DEVELOPMENT GOALS



ABOUT THE ROLE OF ENGINEERS AND ENGINEERING REGARDING THE UN SDGS

Many of the UN SDGs require solutions rooted in technology and engineering. Therefore, engineers must play an important role when it comes to achieving these goals.

While technology and engineering play a part in the achievement of many of the 17 UN SDGs, there are several goals that mainly require competences of a non-technical kind. Whilst engineers must in their activities always consider the wider context, they should focus on the SDGs that explicitly call for engineering competences and technical expertise.

The following table shows one example for a selection of goals, which have technical issues at their heart. Since time and resources of companies and organizations are limited, it is often necessary to focus on certain SDGs. The decision which SDGs to focus on is a strategic one that in most cases depends on several factors, e.g. available resources, area of expertise, national priorities, etc.

As mentioned before, there are some SDGs for the attainment of which engineering and technology play a more direct role than with others. The following



Figure: Role of engineers in achieving the UN SDGs

exemplifies how engineers and technology contribute when it comes to the above highlighted SDGs:

- **SDG 6: Clean water and sanitation**

Engineers and technology are essential to providing a sustainable, affordable, and reliable supply of clean water and of area-wide sewage water treatment.

- **SDG 7: Affordable and clean energy**

Engineers are essential when it comes to the conception and realization of alternative energy sources and an energy-efficient infrastructure.

- **SDG 9: Industry, innovation, and infrastructure**

Engineers are essential when it comes to keeping industry innovative and competitive and public infrastructure on a high level of quality and efficiency, thus motivating investment.

- **SDG 11: Sustainable cities and communities**

Engineers are essential for the conception, development, and realization of solutions to the challenges of increasingly urbanized societies, e. g. sustainable housing, sustainable logistics, urban gardening, sustainable individual/public mobility, etc.

The development of solutions for technical challenges and the further development of existing technical processes and approaches (e. g. circular economy) is the domain of the engineer. However, considering non-engineering factors, e. g. broad public acceptance, is becoming more and more important, since technical solutions are not automatically accepted by society anymore.

Arguably, many technical solutions to achieve the SDGs are already available in the most developed countries of our planet. The challenge is to advocate a change of mind towards sustainable approaches, to make technologies available on a global level and to facilitate the use of more sustainable technological solutions by society; getting the policy frameworks and financial systems to enable implementation of those sustainable solutions means fighting an uphill battle and requires an economical and societal consensus.

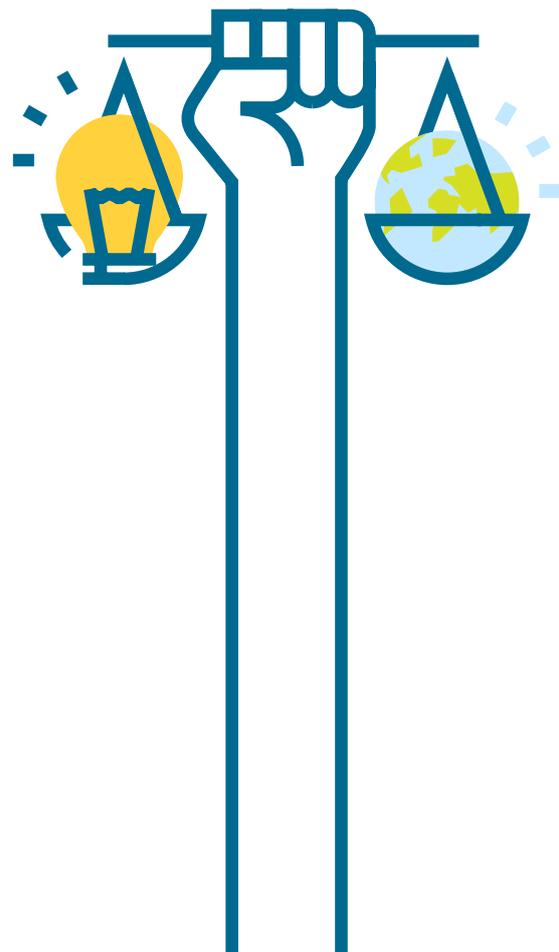
So, to be able to implement solutions under these circumstances, future engineers will have to extend their spectrum of competences beyond expert knowledge in the field of technology and engineering towards a more holistic view and approach, e. g. they need to develop the ability to reflect upon their work before a wider international political and socio-economic context.

Although there are a growing understanding and support of the SDGs in society, there are still a lot of concerns regarding a potential downside of the way towards more sustainable societies, e. g. when it comes to the costs or the perceived antagonism between sustainability and economy, however, embracing sustainability also represents great opportunities for Europe:

- **Companies** may come up with and deliver new services or products, thus creating unique selling points and realizing new market potentials; in addition, they may redesign their own internal processes which will result in a positive image and possibly cost reduction.

- **Individual engineers** may develop a new profile and become experts in their specific field of expertise, answering to an increasing demand in expertise in the field of sustainability

- **Engineering associations** may increase their attractiveness for young people, who identify themselves with the basic idea of sustainability and want to make a difference by playing a role in the process while, at the same time, experienced engineers may be looking for a platform to spread their knowledge and experience



ABOUT WHAT ENGINEERING ASSOCIATIONS CAN DO

Sustainability is per se an engineering topic. It will not be possible to achieve the UN Sustainable Development Goals without the use of engineering and technology expertise. This means that engineers will play an essential role in the global strive for a more sustainable world.

It is the responsibility and obligation of the individual engineers as well as the engineering associations as members of society to take an active part in the discussions, decision-making processes, and actions for achieving sustainability. The engineering community is aware of this responsibility and has accepted the challenges that come with it. In a representative survey by VDI The Association of German Engineers from May 2021, almost 91 percent of the participants voted for “energy and climate protection” as an important or even the most important topic in which political action is urgently required. In the same survey, almost 89 percent voted for “circular economy and resource efficiency” as being of equal importance and in similar need for political action.

However, the will to make a difference and play an active role in the achievement of the UN SDGs comes with several challenges. In a time, in which demographic change causes a lack of young academics, the engineering community must fight to get more children and young people interested in science and technology. Engineering associations must take the lead in this.

Engineers are often disappointed by the fact that their field of work does not receive more appreciation by society, despite the effect it has on everybody’s everyday life. At the same time, many engineers have a hard time to explain to the average citizen with a non-engineering background what the role of the engineer is and how it affects their life and work. Engineering associations must act as translators and communicators and support the individual engineer and the engineering community in this respect.

Engineers regularly express the concern that they are underrepresented in political decision-making bodies. At the same time, they shy away from taking an active role in politics and public political discussions. This is especially regrettable, as engineers with their ability to analyze and gauge different options and put them into perspective are perfectly equipped for an active role in inducing political decisions on overarching challenges. Engineering

associations will have to increase efforts in supporting engineers who are taking an active role in politics. They will have to make clear to engineers the benefits of an active involvement in political processes and public debates and the satisfaction that comes with it.

It will not suffice to repeatedly stress the importance of engineers and technology. Engineers will have to become more active themselves and get involved in political decision-making processes. Engineers will have to offer their support and actively demand to be included into political decisions that require technical expertise and engineering knowledge. Engineering associations have been working and will continue to work as amplifiers of the ambitions of the engineering communities, on a local, regional, national, European and global level.

Some activities on which engineering associations have put a special focus before this background are:

- to improve the general knowledge regarding the contributions and accomplishments of engineers,
- to make the engineering profession better known and emphasize the existential contribution to the well-being of society,
- to get more children and young people, as well as their parents and families interested in natural sciences, technology, and engineering (“science literacy”),
- to support teachers and careers officers in their efforts to get more pupils involved with science, technology, and engineering,
- to develop and foster partnerships with companies, institutions and organizations that share the goals of engineering associations,
- to conduct best-practice exchange within the global networks (FEANI, WFEO¹, BEST², EYE³, etc.) on sustainability related projects/initiatives/activities,
- to be the drivers of discourses, no matter how controversial, to provide “pros and cons” and help weighing decisions, e. g. by providing experts and
- to provide a platform to showcase outstanding sustainability-driving results, organizations/corporations, and individual engineers.

In many cases, a major challenge is to carry these activities and lighthouse projects into the public and the regions, i.e. to reach stakeholder groups outside the engineering community. Although it is quite a rocky path, it is necessary to continue.

1. World Federation of Engineering Organisations

2. Board of European Students of Technology

3. European Young Engineers

ABOUT THE WAY AHEAD

SOME SUGGESTIONS

The prior pages give some general insights into the role of engineers and engineering associations regarding the achievement of the UN SDGs. There are already many excellent examples that show that engineering organizations act. Many of them have developed and adopted strategies concerning the facilitation of topics related to the UN SDGs and the sustainability debate, focusing on engineering and technology aspects.

The unanimous declaration by UNESCO member states of 4 March as “World Engineering Day for Sustainable Development”, has resulted in widespread events, celebrations, and communication on the importance of engineering contributions for advancing the UN Sustainable Development Goals. In 2021, the social media reach was more than 32 million with tweets from the UN Secretary General and spontaneous events across every continent, especially by young people, celebrating themselves as engineers and expressing their pride for the positive impact of engineering on our daily lives.

Many of the national member organizations of FEANI have organized conferences/events/activities around the annual “World Engineering Day for Sustainable Development” that started in 2019. Unfortunately, due to Covid-19, so far everything had to take place online. However, this is another example how to emphasize the contribution of engineers and technology and at the same time use this topic to shed a light on the engineering and technology and their role in our societies. Establishing the “World Engineering Day” as a fixed date for events, conferences and activities around sustainability and the engineers’ contribution to it, should be a major goal of FEANI and its national members.

In September 2021, the FEANI working group on the UN Sustainable Development Goals has introduced a new format for facilitating best-practice exchange and knowledge transfer between the National Member Organizations and their networks. On 22 September, the first of a planned series of web conferences took place, focusing on SDG 6 “Clean Water and Sanitation”. Experts from different areas of expertise provided insights on how their work contributes to the achievement of SDG 6 and shared their ideas with an audience from all over the FEANI community.

The Engineering Council in the UK, as many other FEANI National Member Organizations, is the regulator in the United Kingdom that set standards for education and competences. The EC reviewed the standards in August 2020 and increased the content and requirements for sustainable practice and knowledge of sustainable work. This is something to implement in other countries as well. NMOs must use their role as regulatory bodies and join forces with all other stakeholders in this process to facilitate the development of processes and mindsets that take sustainability fully into account.

VDI The Association of German Engineers for example has made the “1.5 degrees” goal a major theme of its biannual German Engineering Day (DIT) event in May 2021, thus providing a public platform for politicians, companies, civil society and individuals to discuss, exchange ideas and broaden their horizon concerning one of the largest challenges of our times.

These are only three examples and within the FEANI network there are many more. There are several areas in which engineering associations can chose to play an important role, e. g. by providing expert support and pushing the discussion. These include:

- **Engineering education:** Education must reflect the change that is taking place on all levels of life. Digitalization, internationalization, and the need for interdisciplinary approaches demand different skill- and mindsets of future generations. The principles of sustainable development must be brought to the center of engineering education. Therefore, higher education institutions (in cooperation with employers and engineering associations) must react and adopt their engineering programs to include major trends. The new sets of skills and competences that students and young professionals will thus gain, will enable them to successfully deal with the challenges that have to be overcome to achieve the UN SDGs.
- **Continuing Professional Development:** The rapid change in the field of technology and engineering makes life-long learning a “conditio sine qua non” for engineers. While basic engineering knowledge and principles stay the same, some parts of the engineering knowledge acquired at school/university

is outdated after only a few years, according to recent studies. Engineering education must become truly “life-long” as the skills and mindsets required will continuously evolve and change. Engineering associations are actively supporting engineers in keeping up to date with the current requirements and this will need to be intensified in the future.

- **Networking and Advocacy:** Engineering associations bring together engineers from all disciplines of engineering. They are also platforms for exchange with the business, politicians, and other players in civil society, also those from outside the engineering community. Engineers must use and develop these platforms to communicate the importance of sustainable development. They must also strive to

better explain their work and how it contributes, often in the long run, to a more sustainable approach. In addition, engineers must provide expert advice to political decision-making bodies, e. g. European Parliament or the European Commission, as political decisions must be based on solid scientific data.

- **Recruitment and Support:** Engineering associations possess a huge network and are renowned for their impartiality and the high quality of their work. Therefore, they are perfectly suited to recruit and activate the expert knowledge that exists within the engineering community. They can function as a platform to mobilize this knowledge in support of the achievement of the UN SDGs.





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