

WORKPLAN

MEXICAN ACADEMY OF ENGINEERING

INTEGRATION, REFLECTION, INNOVATION, SUSTAINABILITY

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INTRODUCTION.

We are living moments that should involve the breaking of paradigms to confront health, economic, social, and political crises, among others, in which we are immersed.

The world is changing in ways, unimagined a few months ago, our way of seeing life, and facing it.

Social distancing, back in many ways, to the origin, the meanings, the essence of life, the need to change even the economic theories, hitherto put into action, place the spotlight on competitive engineering in its different specialties, which carries inherent innovation and sustainability.

Working together, the integration of knowledge and experience in different specialties of engineering's problem solving are critical.

Our Academy of Engineering is a think tank, with knowledge and experiences, each unique and special member was admitted for their merits and contributions to engineering. We must engage in these paradigm ruptures and rethink our way of seeing life, relationships, and work.

The Mexican Academy of Engineering, through reflection, is a space for the coexistence of leading researchers who collaborate in different institutions, and of outstanding entrepreneurs of innovative and competitive engineering in the public, private and social sectors, who also seek balance with the environment, which makes our Academy a particularly important protagonist in the **Integration, Reflection, Innovation and Sustainability, impacting the national and international sustainable development.**

Four key words in our work, whose initial letters form a keyword: **IRIS**.

IRIS involves muscle, light, modulation, color, articulation, adaptation, and teamwork.

Those four key concepts are the basis of the summary of the Work Plan that is presented below, which is actually a path that should guide us in the short and medium terms. In the short term, collaborating with our future President, Dr. Luis Álvarez Icaza Longoria and in the medium term, continue advancing in the achievements of our beloved Academy, for the benefit of Engineering and our national and international environment.

Based on the Vision of the Mexican Academy of Engineering, established in a Strategic Thinking Workshop: “Creating the Future of the Engineering Academy”, INDICA Consultants, September 2014.

“An **Institution** that is **recognized and respected for its leadership and active participation** in the public, private and social sectors of Mexico, which acts as an **international benchmark and contributes in national strategic issues**, such as education, professional and competitive practice, research, technological development, and innovation; **to achieve an innovative, competitive, and leading Mexican engineering** on issues that **impact the sustainable development of the country.**”

1) **INTEGRATION.**

It is formed by different parts, a whole in order to promote unity; coherence; strengthen the whole, its parts and its interaction with the environment; and foster relationships that produce synergy, in order to "promote, spread the vocation, education, professional practice, research and innovation in engineering at the highest level and with social commitment", in accordance with the provisions of Article 2 of our Statute.

Guidelines:

- To strengthen the work of multidisciplinary programs for solving new problems, challenges and opportunities that are arising in our society, namely:
 - ✓ Foresight and planning;
 - ✓ Education, Engineering Research;
 - ✓ Food and Rural Development;
 - ✓ Manufacturing and Services;
 - ✓ Infrastructure, Transportation and Cities;
 - ✓ Health;
 - ✓ Competitiveness and Innovation;
 - ✓ Natural Resources and Climate Change; and,
 - ✓ Energy and Sustainability.

- To join the Academic reviews and writings, devoted to research and technological development with other Academics who collaborate in the public, private and social sectors, as well as those involved in the financial sector, to materialize projects in benefit of the nation's development.

- To promote the articulation of education, and research in engineering with innovation.
- To relate the work of the Academy, with the work of the Academies of Sciences and Medicine, both national and from other countries, to develop a multidisciplinary approach in the analysis of existing paradigms.
- To transform the Academy of Engineering into a think tank that links the efforts developed by higher education institutions, research, public, private, and social organizations, with innovative and competitive engineering projects.
- To gather and promote the participation of the Academics from the different Specialty Commissions, who are based in diverse geographical locations, as well as to strengthen their regional organization in order to address local and global solutions.
- To add the participation and work of the Academics that do not belong to any Specialty Commission, in order to address the issues and concerns that they need to express to increase their work in the Academy.
- To promote an environment of respect, commitment to ethical conduct, regardless of opinions, recognition of technical hierarchy, regardless of origin, group, or institution to which it belongs.
- To gather the stock of timely and truthful information generated by our Academics, their curricula, their works, both those submitted for admission and recently generated, in order to foster the exchange and full benefit of their knowledge and expertise in pursuit of their goals, in conjunction with those of the Mexican Academy of Engineering.

2) REFLECTION

It is to carefully consider an idea, project, or action.

To shed light to analyze from different points of view, in an objective and respectful manner, who we are as an Academy; what we are in the national and international context, according to our purpose; where we are in perceptions and achievements; where we should go as Academy to arrive to our vision; which are our potentials, our areas of opportunity; looking for the exchange of ideas, knowledge and experiences, of integration and innovation for sustainable solutions.

This, to ensure that the Academy is recognized as an essential leader and interlocutor, and as a permanent consultant to the Government, as well as to organizations in the private sector.

Guidelines:

- To provide various forums of analysis of the new national reality, as well as that of the Academy, respecting diversity and technical hierarchy of each and every one of the Academics.
- To assess the contribution of engineering projects being undertaken in order to understand its impact on national development.

- To analyze and simulate projects, proposals, and actions of the government, in order to issue opinions and recommendations on their feasibility and desirability.
- To define methodology that enables Academics to conduct analysis on proposals and strategic projects required by the newly introduced health issues, education, research, technological, social and economic development, human resources, financial, organizational, information technology and communications in order to foster national development under the current context.
- To analyze, review and propose on the regulatory framework of public institutions, in order to promote a greater participation of the Mexican Academy of Engineering and of the engineering and technology experts.
- To study and determine, along with researchers and academic engineers from the private sector, trends, projects, prototypes, and new devices that are shaping the Fourth Industrial Revolution and 5G, in this new world environment and on its social, labor and economic impact.
- To promote the exchange of knowledge and experiences, through the reactivation of the organization of conferences by specialty.
- To study and spread the importance and impact of engineering to society, including the great achievements of Mexican engineering and the outstanding stories of academic engineers in their different specialties, in order to contribute to leadership in the analysis and reflection on the national engineering, and the importance of their participation and contribution to a sustainable development.
- To strengthen the Academy's editorial production, work, and projects in which it is participating. Likewise, to promote the diffusion of the Academy's website, of the Academic Members' work, and their updates.

3) **I**NNOVATION.

Processes and specifications that contribute to the transformation of reality, introducing improvements to the existing one, with the intervention of originality and creativity in order to solve issues inherent to a competitive and leading engineering that supports development in the current reality, which implies a paradigm rupture.

Guidelines:

- To promote the establishment of a national program of innovators and creators of technology, which promotes R + D + I and sustainable development, in coordination with organizations in the areas of engineering and technology.
- To promote the increase of R + D + I centers that encourage applied science, technological development, and innovation projects.
- To introduce and retain young engineers who have the merits to pursue and join the Academy, who help preserve knowledge and add energy, momentum, and technological advances into the Academics' experience, obtained after many years of work.
- To identify new themes for innovation and areas of opportunity that help to address, with a leadership position, this new reality.
- To identify and set in motion new, non endogamic, ways of academic working that support communication and team work, and that incentivize the active

participation of a greater number of Academics, even within the operation of the Multidisciplinary Programs established in the Academy.

- To consolidate the Academy's observatory, in order to become an information and indicators benchmark, based on an engineering and technology platform, on the basis of a problem-solution method, developed in conjunction with higher education institutions, which contributes to the development of the progress required to overcome the crisis that is looming.
- To contribute and promote engineering projects, activities, education and research to face the digital transformation that is fast approaching.
- To contribute to the generation of knowledge, through publications, colloquia, as well as to promote the work of other Academics in order to encourage the undertaking of competitive and timely multidisciplinary projects.

4) **S**USTAINABILITY.

Is to provide the necessary nourishment, in its diverse meanings; to solve the environment transformation problems, while maintaining its dynamic balance; to sustain a reality so that it does not come to destruction or become distorted.

Guidelines:

- To promote the work of the Multidisciplinary Planning and Prospective Commissions; Food and Rural Development; Natural Resources and Climate Change; Energy and Sustainability; Engineering Education and Research; Manufacturing and Services; Health; Competitiveness and Innovation; as well as Infrastructure, Transportation and Cities; to address problem and propose solutions, in the sustainability mystique.
- To prepare with the business sector sustainability studies in projects and prototypes of smart cities, facility sensors, robotics, mobility, in-house 3D printing, artificial intelligence, data science and digital transformation, among other topics.
- To participate and promote regulation that enables the nation's sustainable operation.
- To participate and promote education and research in engineering, based on the development of sustainable activities and projects.
- To promote multidisciplinary collaboration among Academics, and their interaction with the multinational private sector, as part of the sustainability philosophy.

- To promote within the Academy its sustainability, based on the communication of the work performed by the Academics; the establishment and distribution of the historical heritage; the administrative order; the establishment of secondary regulation that systematizes the Academy's operation, in accordance with its Statute and Regulations; and the improvement of publishing and distribution activities.
- To strengthen the financial structure of the Academy, by increasing the number of Academics with current rights, the rationality of expenses, the regular operation of the Finance Committee and the launch of the Academy's Board.