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#NATIONAL TECHNOLOGY INITIATIVE

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"Social Reflections and Türkiye's Future"

TÜBA
TÜRKİYE BİLİMLER AKADEMİSİ
TURKISH ACADEMY OF SCIENCES

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Editors:

Mehmet Fatih Kacır

Muzaffer Şeker

Mürsel Doğrul

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Vedat Dalokay Cad. No: 112 06670 Çankaya - Ankara

Tel: +90 312 442 29 03 • www.tuba.gov.tr

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Table of Contents

FOREWORD

In today's world, the fundamental requirement of independence is to reach the position of a country that designs, develops, produces and exports technology. Countries that remain only as end users of technology cannot guarantee their freedom in any area. Every event we have experienced in recent years has clearly shown us that we need to be at the forefront in all fields of technology.

Like every innovation, the first step in technological development is imagination. Great futures are built on the knowledge and experience of great pasts. Throughout the centuries, our ancestors have always dreamed of further and more, pursued it, fought, and reached their goals. Our goals, which include the targets/dreams of Turks beyond the horizon and which we refer to as "Kızılelma" (The Red Apple), have always been renewed.

With the National Technology Initiative, Türkiye has started to reach the position of a country that does not follow behind but rather pioneers and paves the way for technological revolutions in many areas. With the public and private sectors of all fields, we are determined to take advantage of every opportunity to take our technological development to a global level and to take an active part in international competition.

Türkiye is a great country built upon a magnificent civilization and a rich history based on science, wisdom and wisdom.

The National Technology Initiative is an important breakthrough in which we started to reap the fruits of the legacy of our civilization on the 100th anniversary of our Republic. We are proud to personally follow every stage of this breakthrough, including project, design, and financing. It is pleasing to see that the national and original model development studies have reached the point where the ready-made purchase projects of many products such as tanks, helicopters, aircraft, and unmanned aerial vehicles have been canceled. Türkiye is now a country that can produce two-thirds of its defense industry needs. Furthermore, we also laid the foundations of national and domestic production in many fields from health to education, and from energy to transportation.

I find the book titled "National Technology Initiative: Social Reflections and Türkiye's Future", in which the Turkish Academy of Sciences documents the latest point our country has reached in the field, on the production line, in the air, in the sea, in space, and in the software world with scientific meticulousness, important.

This work, prepared with the contribution of technology experts and researchers, scientists, decision-makers, and public and private sector representatives, aims to translate our country's National Technology Initiatives into a scientific corpus.

I believe that this work, which shows the contributions of all stakeholders in the stages of our country's becoming an actor with a voice in global politics and a technology base, will be an important source of reference.

I congratulate those who contributed to the preparation of this work, which is a signature that will transfer what we do today, what we will do tomorrow, and the effects of these to future generations for the National Technology Initiative.

Recep Tayyip ERDOĞAN
President of Türkiye

FOREWORD

Technological development is only possible through a combination of strong and planned macroeconomic policies and competition-oriented structural reforms. In today's world, countries that are able to follow scientific and technological developments in the best way, internalize these developments and adapt them to their policies can achieve an effective position in the global economy. In the 100th anniversary of Republic Türkiye, our top priority is to take steps that will reinforce our country's independence in every aspect and increase its social welfare. To this end, we formulate our policies with the awareness that achievements in the fields of industry and technology are the most decisive factor in the future of countries. In order to improve Türkiye's technological competence, we continue to support all kinds of scientific and technological developments in search of the "new", "better" and "undiscovered".

The National Technology Initiative, which we launched under the leadership of our President Recep Tayyip Erdoğan, is the name of the vision that will ensure Türkiye's economic and technological independence, and the conceptual definition of our efforts to maximize our ability to design, develop and produce critical technologies and products with national capabilities. “Our 2023 Industry and Technology Strategy”, which we have created in line with this vision, serves as an important reference to achieve our goals in this period when we are building the “Türkiye’s Century”. We touch all areas in need with the multidimensional policies we have built on five components: High Technology and Innovation, Digital Transformation and Industrial Move, Entrepreneurship, Human Capital and Infrastructure. We are laying the foundations of a strong technology-based industry with the Technology-Oriented Industrial Move, National Space Program, Digitalization and National Artificial Intelligence Strategy; we are creating technological awareness through major events organized under thematic titles such as TEKNOFEST, Science Festivals and Sky Observation Events.

The book titled "National Technology Initiative: Social Reflections and Türkiye's Future", prepared by our esteemed institution, the Turkish Academy of Sciences aims to bring scientifically to the literature the cornerstones of our country's breakthrough in the national technology and its experiences along this way. This work, which deals with the National Technology Initiative in 37 multi-dimensional chapters, includes the views of primary sources while addressing our technology-based national development initiative from the perspective of our scientists. In this context, I consider this work, which has the characteristics of a basic human input for our policies on science, R&D and innovation in the future, to be very valuable. I would like to thank TÜBA administrators and employees, especially our scientists, who are the servants of National Technology, who contributed to the completion of the work. I hope that this work, which records the first fruits of the scientific and total development that comes with the National Technology Initiatives, will be beneficial for our country.

Mustafa VARANK
Minister of Industry and Technology

FOREWORD

As Türkiye's national academy of sciences, Turkish Academy of Sciences (TÜBA) maintains its efforts to enhance the number of qualified people in our country. Our Academy, which is comprised of experienced and capable scientists from numerous regions of our country and the world, utilizes this capacity for the betterment of future generations' education.

The impact of technological progress improved production capacity, and increased productivity on national economic development and wealth is undeniable. The expansion of investment capital and the strengthening of the financial sector are also significant economic benefits for a nation. Nonetheless, the synergy formed by these issues is a series of long-term processes that guarantee the nation's self-confidence, independence, stability, and security. This is only achievable with accumulated, qualified, and volunteer human capital that demonstrates a willingness to work through struggle, exertion, solidarity and sacrifice. As a result of the National Technology Initiative's advancement, Turkey has taken more than two centuries to adopt and develop new technologies for society. In order to grow the proportion of R&D activities in a country and transform research into products, a qualified workforce with long-term strategic goals is required. Even though physical investments produce quick effects in a limited amount of time, these results can only be sustained through investments in human resources. In the absence of continuity, temporary reliefs and fake growth will continue to be costly, short-term achievements. For his support, we would like to sincerely thank the Dear President of our country, who has demonstrated a strong commitment to the long-term viability of the National Technology Initiative and backed scientists at every stage.

TÜBA fulfills its commitments of "Ensuring the dissemination of scientific approach and thought in society, encouraging young scientists" and "Granting awards to promote the appreciation and acceptance of the significance of science by the public opinion of the country and stimulating scientists" through TÜBA's award programs and working group activities.

TÜBA Outstanding Young Scientist Awards (TÜBA-GEBİP) aims to bring young scientists who have distinguished themselves through their research under the auspices of the Academy, to create a dynamic environment arising from their interactions among themselves and with the members of the Academy, and to provide the necessary academic and financial support and encouragement. TÜBA also recognizes young scientists through the TÜBA-TEKNOFEST Doctoral Science Awards program. Science and Engineering, Health and Life, and Social and Human Sciences are the three fields in which doctoral dissertations in the National Technology Initiative's key areas are awarded.

TÜBA International Academy Awards were initiated to encourage and award scientists whose work and contributions to science are recognized worldwide. In addition to the Academy Awards and similar international scientific activities, TÜBA conducts science diplomacy to contribute to the representation and recognition of the Turkish scientific community in the international arena.

TÜBA thematic working groups organize scientific activities on strategic issues on the agenda of Türkiye and the world with the voluntary contributions of qualified scientists of our country. The national and international conferences and symposiums organized by TÜBA working groups offer scientific evaluations and recommendations on the origins and solutions of problems with the participation of relevant stakeholders. Our specialization

working groups also contribute to the nation's representation in umbrella organizations like Science-20, the International Science Council (ISC), and the Inter-Academy Partnership (IAP). The reports prepared and books published by these groups as a result of these activities are a source of reference for decision-makers.

As TÜBA, we believe that the scientific outputs of our scientists are crucial to the future of our nation and humanity. The "National Technology Initiative" is the general title definition of the scientific and technology outputs proposed by our nation's decision-makers, administrators, and scientists in recent years. "National Technology Initiative: Social Reflections and Türkiye's Future" focuses on the individual, institutional, and social interactions of Türkiye's strategic support for R&D investments and scientific activities, which have resulted in the growth of Türkiye's international competitiveness in this field. This book provides examples of national technological progress, the academic perspective of scientists, and the institutional activities that contribute to the National Technology Initiative.

I would like to convey my gratitude to the chapter authors who contributed to the book, which explores the National Technology Initiative in all of its dimensions. I believe that the book will make significant contributions to the adventure of our nation, which is moving confidently into the future.

Prof. Dr. Muzaffer ŞEKER
TÜBA President