UEICT UNION OF EMPLOYERS OF INFORMATION AND COMMUNICATION TECHNOLOGIES

CIPE | CENTER FOR INTERNATIONAL PRIVATE ENTERPRISE

The Prospects of Microelectronics Sector Development
Policy Brief

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1. Key Problems of Technological Industry

In the century of rapidly developing technologies the global economy is transitioning to the Fourth Industry Revolution, which considers to be the second phase of digital revolution. Not only is the structure of production changing, but also the structure of industry/sectoral markets, and new subjects of competitive relations are emerging.

The Industrial Revolution is the continuous mechanization/automation of production and industrial practices. In this context, the main engine of global transformations is the latest technologies, the application of which further reduces human intervention and fundamentally transforms people's lifestyles and worldviews, as well as social and production processes. Artificial intelligence, machine learning, robotics, and digital technologies have ushered in the fourth industrial revolution. And the most important pillar of these unprecedentedly rapidly developing technologies is Microelectronics. Currently, high technologies are experiencing unprecedented development, which, combined with complex geopolitical processes, requires much more complex solutions and takes on more complex forms. All this creates new challenges and, of course, unprecedented opportunities for countries and the private sector.

In this situation, governments, in close cooperation with the private sector, have a task to quickly identify potential risks and develop policies that will be aimed at the impact of the expected multi-sector and multi-level changes. Currently, governments of developed countries such as the USA, South Korea, China, India consider microelectronics a strategic priority, stimulate investments, encourage public-private cooperation, placing particular importance on research and development (R&D).

2. The Prospects of the Development of Microelecronics in Armenia

The Republic of Armenia should take advantage of this situation as much as possible, taking into account the rich past and present experience in the field of microelectronics. Armenia has a traditional stable foundation in the field of microelectronics. Back in the Soviet era, in the second half of the 1960s, this direction began to develop rapidly in Armenia.

Currently, more than ever, the development of the technological industry, particularly microelectronics, is of strategic importance for all countries, on the one hand as a national security issue, and on the other hand, as a sector that creates high added value and serves as a locomotive for the entire economy and ensures high productivity.

The need to develop the microelectronics subsector is enshrined in the RA Government's Resolution No. 534-L of 2023, which defines five priority sectors for industrial development. According to the resolution, from the perspective of the development of the equipment manufacturing sector, emphasis is placed on the subsectors of mechanical engineering, microelectronics, and solar technologies, considering microelectronics as a subsector providing high export indicators.

Emphasizing the importance of promoting human resource development in the microelectronics subsector, by the Decision of the Government of the RA No. 1035-N of June 18, 2020, income tax on the salary and equivalent payments of a student studying in a postgraduate program in the specialty "Electronics, Micro and Nanoelectronics", among other specialties, is refunded for the purpose of tuition reimbursement.

Currently, Armenia has research branches of major global corporations (Synopsys, Siemens, AMD, Nvidia, Cisco, Microchip, etc.) that are major players in the industry, and there is world-class professional capabilities, which on the one hand has been the reason for these global corporations to come to Armenia and also, thanks to the presence of these corporations, has led to even faster development of the industry.

For example, the work of Synopsys Armenia is important in the development of microelectronics through education and science. The educational programs implemented have contributed to the formation of a competitive workforce, as well as the international recognition of Armenia. At the initiative of Synopsys Armenia, an annual Microelectronics Olympiad has been held in Armenia since 2006. And in 2024, at the initiative of the Union of Employers of ICT in Armenia, the International Microelectronics Forum was held for the first time.

In the field of High-Tech Industry, in line with the policy adopted by the Government of the Republic of Armenia, the Union of Employers of ICT has formed a Microelectronics Development Platform in the context of public-private cooperation with a number of leading companies in the technology sector. During the two consecutive meetings held within the framework of the

platform, the main sectoral issues related to technological production processes, imperfections of national legislation, competitiveness in the global market and predicted global challenges were highlighted. The political priorities of the Ministry of HTI, implemented measures, and new initiatives were presented. The platform proposed to consider Microelectronics as one of the important pillars of national security and technological industry development in the process of developing the HTI strategy. The need for conducting evidence-based research and studies was discussed in order to develop the microelectronics development strategy and program.

As a result of the meetings held within the framework of the public-private cooperation platform, a proposal for priorities for the development of Microelectronics was developed.

3. The need and priorities for the development of microelectronics

First, in order to identify the key issues of microelectronics in Armenia, it is necessary to define what microelectronics is as an ecosystem, as a subsector of the technological industry, as a scientific and technological direction, part of the production chain, and as a profession/occupation.

The vision of the national strategy for the development of the microelectronics subsector in the Republic of Armenia for the next ten years is to have a developed microelectronics ecosystem, contributing to Armenia's national security and economic growth, the formation of a production chain, competitiveness in international markets, and increasing the country's recognition.

Develop a short-term, medium-term and long-term strategy for the formation and development of a microelectronics ecosystem, which will contribute to the formation of appropriate infrastructure, scientific-technological and production chains in Armenia, the interaction of various technology companies, the creation of greater added value in Armenia and advancement in the global market.

Having briefly presented the priorities for the development of microelectronics, we propose to start substantive discussions in this direction, enshrining it in the HTI development strategy:

The priority goals and objectives to achieve the vision are:

1. **Goal: Development of a National Microelectronics Ecosystem and Value Chain Formation**

1.1 Promote the development of Microelectronics Value Chain
1.2 Develop public-private partnerships and promote the development of relevant infrastructures
1.3 Support the creation of a system for analyzing national and international markets in the sector for evidence-based policy development and implementation

1.4 Encourage the formation of startup companies in the sector
1.5 Introduce state support incentives and encourage investment policies

2. **Goal: Advancement of Scientific Research Policies in the Microelectronics Subsector**

2.1 Encourage businesses to initiate and conduct research and development (R&D) in the microelectronics subsector
2.2 Support the commercialization of technologies, from research to production
2.3 Improve the legislation on the intellectual property (IP) protection and enforcement system
2.4 Develop and implement state support incentives both through legislative changes and state support measures.

3. **Goal: Support and Promotion of Competitive Human Capital**

3.1 Promote public-private cooperation at all levels of education (general education, secondary vocational and higher education) in STEM areas, review curricula and teaching methods
3.2 Introduce incentives and state support programs to involve the private sector in educational processes
3.3 Promote postgraduate and continuing education in the field.

4. **Goal: Positioning Armenia as a Global Microelectronics Brain Hub**

4.1 Support Armenia's active involvement in global processes in the sector through public-private partnership
4.2 Organize national and global events, ensure participation in international events held abroad
4.3 Promote the involvement of global companies through the absorption of local companies.