
BCMUN
British Columbia Model United Nations 2023

Directors Letter:

Dear Delegates,

My name is Vanessa Chen and it is my distinct pleasure to serve as your Director for The United Nations Commission on Science and Technology for Development at BCMUN 2023! Along with my Chair, Dimitrios Fragkos, and Assistant Director, Kevin Xu, we hope to foster fruitful debate.

Ever since tripping on my way up to the podium at my very first MUN conference, I have been enthralled by the world of Model UN, sparking my interest in international relations. Whether it be intense debates over international conflicts, or the adrenaline rush of making it back in the committee room after a Starbucks run, MUN has granted me with life-long friendships and invaluable memories. Through its exhilarating nature, I have learned to collaborate, debate, and find solutions to undertake any difficult challenges. I am confident all delegates will experience a similar journey of growth at BCMUN.

The United Nations Commission on Science and Technology for Development is a crucial organ of the United Nations, as a subsidiary body of the Economic and Social Council. As such, delegates must discuss the root causes of countless current world conflicts and the driving force in economic decline: the semiconductor shortage. While the current macroeconomic state of our world is only exacerbating this issue, it is evident that solutions are urgently needed. Similar to how small microchips hold power to cause massive destruction, delegates with unique viewpoints hold the power to create solutions for great change. To ensure effective debate, it is expected that delegates prepare thorough research on the topic at hand as well as your personal stances.

I wish you all the best of luck in your preparations, and await meeting all of you in January!

Sincerely,
Vanessa Chen
Director of UNCSTD - BCMUN 2023

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Semiconductor Shortage Crisis

Committee Overview

During the United Nations Conference on Science and Technology for Development held in Vienna, 1979, an Intergovernmental Committee on Science and Technology for Development was established to assist the General Assembly in the aspects such as identifying and assessing new scientific and technological developments with adverse effects, promoting those with specific potential importance for humanity development process, and strengthening the scientific and technological capacity of the developing countries.[1] In 1992, the above-mentioned committee was transformed into the functional United Nations Commission on Science and Technology for Development (UNCSTD), subsidiary to the Economic and Social Council (ECOSOC).[2] The United Nations Conference on Trade and Development (UNCTAD) secretariat provides substantive support to the Commission.

Annually, UNCSTD holds an intergovernmental forum for discussion on timely and pertinent issues affecting science, technology, and development, in order to provide the UN with high-level guidance on policy making and financial arrangements. Some of the important normative issues raised previously include the technology and life interface, technological contribution to sustainable development goals, as well as governance of the use and development of frontier technologies – big data analytics, biotech and genome editing, the Internet of Things and artificial intelligence. In addition, UNCSTD also offers a space for concrete collaborations between member states, academia, civil society, and the business community engaged in science and technology for development, discovering new ways that both developed and developing countries contribute to science, technology, and innovation.[3]

Today, during a century consisting of rapid scientific and technological developments and frequent innovation appearance, the opportunities and obstacles at the juncture of science, technology, and innovation and the need for sustainable development are becoming more complex, global, and far-reaching.[4] The digital divide is further widening, depriving the opportunity for developing countries to harness science, technology, and innovation for their own development. People are also at risk of being outpaced and left behind by the extending development frontiers. Thus, the significance of UNCSTD has been widely acknowledged and enhanced.

1 https://digitallibrary.un.org/record/9951?ln=en

2 https://documents-dds-ny.un.org/doc/UNDOC/GEN/N92/352/68/IMG/N9235268.pdf

3 https://unctad.org/topic/commission-on-science-and-technology-for-development/about

4 Ibid.

Topic Introduction

The United Nations Commission on Science and Technology for Development is a subsidiary body of the Economic and Social Council, one of the six main organs of the United Nations. Established in 1992, its aim is to provide the General Assembly and the Council with note-worthy advice regarding matters of science and technology, through analysis and appropriate policy recommendations or options. There are 43 members in the Commission, elected for four year terms by the ECOSOC. The agenda's item for this conference is the ongoing semiconductor shortage crisis, which has had a detrimental effect on the world since its beginning in 2020.

When referring to semiconductors, we mean integrated circuits, commonly referred to as microchips. They are a key part of society as we know it today, being used in almost every industry sector, from blenders to cars. The crisis has led to major price increases, shortages, queues, and scalping among consumers for automobiles, computers, household appliances, and other products that require semiconductors. The cause of this shortage crisis is a "perfect storm", starting-off with the COViD-19 pandemic. Two main pillars are the crux of the problem: Supply and Demand.

Demand for semiconductors skyrocketed as soon as the pandemic started. Due to remote working and learning, computer sales in 2020 Q4 measured a 26% growth over the previous year. The rise of cryptocurrency mining, which is done using specialised and/or very high-end computer hardware, further reduced the availability of microchips in the global market.

Supply, on the other hand, had never seen such an all-time low. The CoViD quarantine had multiple factories closed. The China-US trade war made it harder for Chinese producers to sell to American-based companies, further limiting the already minimal supply. Another contributing factor was when in 2021 severe weather phenomena were experienced by major chip factories, which provide the majority of semiconductors on a global scale. Finally, the war in Ukraine has had a significant impact on the shortage's development. As an example, the increased price of Neon, a much-needed gas in the production of chips, is attributed to the recent conflict.

Both governments and companies have reacted to the situation, with measures that vary greatly. The semiconductor shortage crisis is truly a global issue, and thus requires global cooperation to be fixed. That's where the UNCSTD - and UN in general - is involved, and why its opinion on the matter is crucial for the whole world.

Topic History

The history of semiconductor shortages dates back to the 1970s, when the demand for semiconductors began to increase rapidly due to the proliferation of computers and other electronic devices. At the time, the production of semiconductors was limited by the availability of silicon wafers, the raw material used to manufacture semiconductors. As a result, there was a shortage of semiconductors, leading to higher prices and longer lead times for electronic devices.

The first major semiconductor shortage occurred in the late 1970s and early 1980s. The demand for semiconductors was fueled by the rapid growth of the computer industry and the development of new technologies such as personal computers and video game consoles. However, the production of semiconductors was unable to keep up with the demand, leading to a shortage of these critical components.

The semiconductor industry responded to the shortage by increasing production and improving manufacturing processes. Companies also began to diversify their product offerings and expand into new markets, such as mobile phones and consumer electronics. These efforts helped to alleviate the shortage and stabilize the market.

However, the semiconductor industry faced another major shortage in the late 1990s and early 2000s. This time, the shortage was caused by a rapid increase in demand for electronic devices, such as mobile phones and personal computers. The demand for these devices was fueled by the dot-com bubble, which led to overinvestment in the semiconductor industry. As a result, there was an excess supply of semiconductors, leading to a crash in prices and a downturn in the industry.

The semiconductor industry responded to this crisis by consolidating and restructuring. Many companies went out of business or were acquired by larger competitors. The surviving companies focused on improving their efficiency and reducing their costs in order to stay competitive.

In the years following the dot-com bubble, the semiconductor industry experienced a period of stability. Demand for semiconductors grew steadily, and the industry was able to meet the demand through a combination of increased production and technological improvements.

However, the current semiconductor shortage, which began in late 2020, has been caused by a number of factors. One of the main factors is the COVID-19 pandemic, which disrupted global supply chains and led to a decrease in the production of semiconductors. In addition, the demand for semiconductors has increased significantly due to the growth of the Internet of Things (IoT) and the use of artificial intelligence (AI) in various industries. This increase in demand, coupled with supply chain disruptions, has led to a shortage of semiconductors.

The semiconductor world shortage crisis has had a significant impact on various industries, including the automotive, electronics, and healthcare industries. It has caused delays in the production of electronic devices and has led to higher prices for these products. In addition, it has disrupted the supply chain for various products, including medical equipment and automotive parts.

In response to the current crisis, the semiconductor industry has taken a number of steps to increase production and address the shortage. Companies have invested in new manufacturing facilities and equipment, and have increased their use of automation and other technologies to improve efficiency. Governments have also provided financial support to help companies expand their production capacity.

Despite these efforts, the semiconductor shortage is expected to continue for the foreseeable future. The demand for semiconductors is expected to continue to grow as the use of electronic devices and technologies such as IoT and AI expands. As a result, it is likely that the semiconductor industry will continue to face challenges in meeting the demand for these critical components.

Conclusively, semiconductor shortage crises on a global scale have always been an issue that the sector of electronics has had to face. It is a problem that dates back to the creation of the first-ever computer, and one that will continue to exist for the foreseeable future. We can only try to mitigate its effect both on society and on the economy, with drastic and well-thought measures and policies.

Current Situation

Historically, semiconductor shortages have only lasted short-term, however, this current crisis is defying these standards. The primary factor in the status quo that has been dictating the turbulence in supply of micro-chips is COVID-19.

This virus was met with unprecedented all-time lows in the supply chain market of microchips. Manufacturing companies anticipated low-sales, thus decreasing their orders for micro-chips. Once factories received this news, many completely shut-down while others closed these fabs to leave space for the manufacturing of other more profitable products. However, once the market saw increased technology use, factories' lack of preparation and space caused high demand to be met with insufficient supply.

To fulfill the constant demand for semiconductors, plans have been made to construct more microchip factories. Currently, industry experts are aiming to create a solid mix of old and new inventory in their geometrical size, quality, and efficiency. Many fabs have already started construction, and are expected to be completed in 1-2 years. Chip factories have been emerging in the US, Japan and Korea, but the most in China and Taiwan. The industry expects 200 fabs operating on 300mm technology by 2026. This process is long, and while effective later on, fails at resolving this crisis in the short-term.

Past Action

The United Nations hasn't addressed this issue. However, individual countries and corporations have responded to the shortage by adopting prudential regulations and policies in the legal arena. For example, the U.S. has signed into the CHIPS and Science act, which sends chipmakers $53 billion to boost their manufacturing. Additionally, China has provided $144 billion worth of support to its semiconductor industry.

Through the shortage, dependency on superpower countries in the industry has become transparent. Certain countries unhappy with this power dynamic have intended to raise international competition, and reallocate their funds toward chipmaking fabs.

Nevertheless, there hasn't been sufficient collaboration in the global setting to attain beneficial impacts for all.

Case Study - China's semiconductor sector history

China's semiconductor industry started around 1960. In the following years, more semiconductor industries emerged, including the United States, Japan, Taiwan, and South Korea; however, China evidently fell behind.[5] That's when Jiang Zemin and many other Chinese leaders demanded acceleration in the microchip industries, with the goal of increasing overall macroeconomic productivity. Many industry leaders decided to form foreign Projects 908 and 909 commenced. Project 908 pursued a partnership between China's Wuxi Hua Jing production line and the United States' Lucent Technologies to collectively work on technology designs and train engineers. However, this plan took 8 years to become reality, suffering from red tape bureaucracy. [6]Subsequently, project 909 emerged, learning from 908's past mistakes. Nationwide resources were mobilized to eradicate red-tape policies and bureaucratic barriers. [7]Shanghai Huahong took only 2 years to establish and with the support of the nation, began profiting soon later. [8]Soon after, the global recession hit Huahong and they lost profit and national support. In the end, the project failed and China's catch-up plan fell. This was due to their lack of awareness about their foreign counterparts as well as competition and growth in this fast-evolving sector. Additionally, the rigid bureaucratic system hindered state-sponsored factories' growth, but even with looser bureaucratic laws, China's top leaders lacked knowledge about technology acquisition and advancement, resulting in inconsistent support from the state, so China fell behind in this fierce global competition.
While in the status quo China has set ambitious goals in this sector, in those decades, China's industries found limited success and small profit margins.

[5] https://www.cigionline.org/static/documents/documents/no.252%20web.pdf
[6]https://www.usitc.gov/publications/332/journals/chinese_semiconductor_industrial_policy_past_and_present_jice_july_2019.pdf
[7] https://www.sixthtone.com/news/1010985/if-tech-transfers-didnt-build-chinas-chip-industry%2C-what-did%3F
[8] https://swarajyamag.com/tech/latecomer-chinas-semiconductor-catch-up-key-lessons-india-can-take-from-the-chinese-experience

Bloc Positions

The semiconductor shortage has been a global issue that has affected countries around the world. Different countries have taken various approaches to address the issue.

One of the main ways that countries have responded to the shortage is by providing financial support to their domestic semiconductor industries. For example, the United States has provided billions of dollars in funding to help companies expand their production capacity and improve their competitiveness. The European Union has also provided financial support to its semiconductor industry, including funding for research and development and investment in new manufacturing facilities.

Other countries have sought to address the shortage through trade policy. For example, the United States has imposed tariffs on semiconductors imported from countries such as China in an effort to protect its domestic industry. The European Union has also taken steps to safeguard its semiconductor industry by restricting the export of certain technologies to certain countries.

In addition, some countries have sought to address the shortage by diversifying their supply chains and reducing their reliance on a single supplier. For example, Japan has invested in domestic production capacity and has sought to diversify its supply sources in order to reduce its reliance on other countries.

Overall, the approach that different countries have taken to address the semiconductor shortage has been influenced by their domestic semiconductor industries and their economic and political priorities. Some countries have prioritized the protection and growth of their domestic industries, while others have focused on diversifying their supply chains and reducing their reliance on a single supplier.

Further Research

A Look at Semiconductor Supply Chains

https://www.tsmc.com/english/aboutTSMC/dc_infographics_supplychain#:~:text=The%20semiconductor%20supply%20chain%20involves,circles%20back%20to%20System%20Companies

- Detailed explanation on the structure and the procedures of semiconductor supply chains
- Proposed the conception of supply chain management, and provided key commitments on its coordination, rationalization, and sustainability maintenance. A guide for delegates to discover the possible jeopardized segments and respective initiatives

The Global Semiconductor Chip Shortage: Causes, Implications, and Potential Remedies

https://www.sciencedirect.com/science/article/pii/S2405896322017293

- A complete analysis on the issue at hand, with information on the global semiconductor market, causes and effects of the shortage, as well as recommendations on potential solutions

When the Chips are Down: Governments Move to Address Shortage

https://www.counterpointresearch.com/chips-governments-move-address-shortage

- Previous governmental responses to the crisis from countries with some of the biggest and advanced semiconductor industries

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