Enhancing Technology and Innovation Management Practices in APEC Economies

A Focus on Public Policies and Programs to Promote Academia-Industry Technology Transfer

---

APEC Policy Partnership on Science, Technology and Innovation

May 2025

Asia-Pacific
Economic Cooperation

Asia-Pacific
Economic Cooperation

Enhancing Technology and Innovation Management Practices in APEC Economies

A Focus on Public Policies and Programs to Promote Academia-Industry Technology Transfer

APEC Policy Partnership on Science, Technology and Innovation

May 2025

APEC Project: PPSTI 202 2023A

Produced by
National Council of Science, Technology and Innovation of Peru (CONCYTEC)

For
Asia-Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Singapore 119616
Tel: (65) 68919 600
Fax: (65) 68919 690
Email: info@apec.org
Website: www.apec.org

APEC#225-PP-04.5

Contents

1. Introduction 8

2. Methodology 10

2.1. Case Study Report. 10

2.2. Expert Case Study Collection. 11

2.3. Workshop 12

2.4. Surveys 12

3. Workshop Overview 13

3.1. Description of the Workshop: 13

Day 1: Identifying Barriers and Exploring Best Practices 13

Day 2: Advancing Technology Transfer Strategies and Exploring International Partnerships 14

3.2. Summary of the Presentations 15

3.3. Summary of the Discussions 22

Day 1 Discussion 22

Day 2 Discussions 22

Summary of Wrap-Up Session 23

3.4. Workshop Summary Key Results 24

4. Limitations of the Study 27

5. Case Study Insights: Best Practices for Technology Transfer 28

6. Recommendations in STP policy and TIM 36

Promoting Talent Development 36

Promoting STEM Education 37

Sustained Investment in Research and Development 38

Harmonizing Regulatory Frameworks 39

Investing in Strategic Areas 40

Fostering International Partnerships 41

Developing Innovation Ecosystems 42

Developing Innovation Culture 43

World Class Universities 44

7. Innovation Roadmap: Short, Medium, and Long-Term Recommendations 45

Short Term (0-2 years): 45

Medium Term (2-5 years): 45
Long Term (5 years and beyond): 46
Additional Considerations: 46
8. Conclusions 48
9. Annexes 49
Annex I: Agenda 49
Annex II: Speakers and Organization Team 50
Annex III: List of participants 51
Annex IV: Survey 53
Result of Survey 55
Conclusion of the survey: 57
Annex V: Study cases 58
Annex VI: Photos 79

Glossary and Acronyms

APEC (Asia-Pacific Economic Cooperation): A regional forum for promoting economic growth, cooperation, trade, and investment in the Asia-Pacific region.

CONCYTEC Council for Science, Technology and Technological Innovation

SDITT Sub direction of innovation and technology transfer

PPSTI Policy Partnership on Science, Technology and Innovation

NSTDA National Science and Technology Development Agency

OECD Organisation for Economic Co-operation and Development

WIPO World Intellectual Property Organization

TIM (Technology Innovation Management): The management and commercialization of new technologies within organizations and industries.

STP (Science and Technology Policy): Government policies that support scientific research, technological development, and innovation.

R&D (Research and Development): Activities to create or improve new products.

SMEs (Small and Medium Enterprises): Businesses with limited employees, crucial to economic growth.

PPP (Public-Private Partnerships): Government and private sector collaboration to develop public infrastructure or services.

NIS (National Innovation Systems): Networks of institutions and policies that influence a domestic's innovation capacity.

TRL (Technology Readiness Level): A scale used to measure the maturity of a technology.

IPR (Intellectual Property Rights): Legal protections for creations and inventions.

Inclusive Innovation: Innovation that benefits a broad segment of society.

Capacity Building: Enhancing skills and resources to improve organizational effectiveness.

Cross-border Collaborations: Cooperative efforts between organizations or governments from different economies.

Digital Transformation: Adopting digital technology across all areas of business and society.

Executive Summary

This report comprehensively analyzes the implications and recommendations for establishing Science, Technology, and Innovation Policies (STP) and Technology and Innovation Management (TIM) in the context of technology transfer for developing economies within APEC member economies. It offers actionable recommendations for APEC economies to explore and identify best practices that promote effective technology transfer between public and private sectors, including academia and industry, across the APEC region.

The findings summarized in this report are based on a comprehensive research study conducted using a mixed-methods approach. The study began with an extensive review of case studies by subject matter experts, which formed the foundation of the Case Study Report. This was followed by the APEC Technology Innovation Management Workshop, which gathered experts from various fields to share their insights and experiences. The workshop, held on 14-15 August 2024, at the Lima Convention Center in Peru, included participatory discussions through working groups that identified key trends, challenges, and opportunities in technology innovation management.

The workshop's primary objective was to identify best practices for promoting innovation and commercialization of technologies in APEC economies. Through rigorous analysis of shared experiences and group discussions, it highlighted key challenges and opportunities in technology transfer and developed strategic recommendations to strengthen innovation ecosystems and enhance regional competitiveness.

The report is structured to provide a concise overview of the workshop and covers key areas essential to its objectives. It begins with the Study Objectives, outlining the main goals of the workshop, followed by a section on Methodologies that details the research methods and data collection techniques used. The Expert Presentations section summarizes the insights shared by invited experts, and the Key Findings section synthesizes the most significant discoveries and conclusions from the workshop discussions. Finally, the report concludes with Recommendations, offering actionable steps for APEC economies to foster innovation.

Key recommendations include harmonizing regulatory frameworks across APEC economies to reduce barriers and foster innovation, increasing R&D funding in high-potential areas such as artificial intelligence, biotechnology, and clean energy, and strengthening collaboration through incentives and platforms for regular dialogue. Promoting talent mobility and supporting SMEs through targeted initiatives were also identified as critical strategies, along with implementing data-driven policies to monitor and adapt strategies effectively.

The report also highlights the importance of tax incentives, targeted research grants, and collaborative platforms for facilitating effective technology transfer between academia and industry. It underscores the role of next-generation strategies, such as public-private partnerships, digital innovation hubs, and cross-border collaborations, as critical for enhancing domestic innovation systems, boosting R&D output, improving commercialization rates, and increasing global competitiveness.

1. Introduction

Technology transfer is widely recognized as a critical mechanism for economic development, enabling the diffusion of innovations from research institutions and universities to industry, where they can be commercialized and scaled. Effective technology transfer drives economic growth and facilitates the spread of new technologies that can address global challenges such as climate change, healthcare, and sustainable development. In APEC, where member economies exhibit varying technological advancement and innovation capacity, technology transfer becomes even more crucial. It serves as a bridge to help close the gap between developed and emerging economies, ensuring that technological advancements are shared and utilized for the entire region's benefit (Bozeman, 2000).

On the other hand, innovation management systematically promotes innovation within organizations and across industries. It includes fostering an organizational culture that supports creativity, implementing processes that encourage the development of new ideas, and strategically managing the commercialization of innovations. Innovation management has become a cornerstone of economic resilience and competitiveness in the rapidly evolving global economy, where digital transformation and the Fourth Industrial Revolution reshape industries. For APEC economies, mastering innovation management is essential for maintaining relevance in global value chains and driving long-term economic growth (APEC, 2023).

This report presents the results of a comprehensive research study conducted using a mixed-methods approach. Initially, an extensive review of case studies by subject matter experts was carried out, providing a solid foundation for the research. Those analyses become a Case Study Report. Subsequently, a participatory workshop called the APEC Technology Innovation Management Workshop. It was organized where experts from various fields presented their knowledge and experiences. During this event, discussions were facilitated through working groups, allowing for identifying trends, challenges, and opportunities in the field of study. Combining these methodologies ensures a comprehensive understanding of the subject, integrating theoretical knowledge and experts' practical experience.

The case study report, prepared as input for the workshop activities, aimed to conduct a comprehensive study of selected APEC economies, focusing on three key areas. First, it assessed the development of public policies designed to facilitate technology transfer and innovation, highlighting the effectiveness of these policies in each economy. Second, the report identified the main barriers hindering technology transfer within APEC, providing insights into the challenges that need to be addressed to improve the flow of technologies. Lastly, it emphasized the best practices promoting successful models of technology transfer between academia and industry, showcasing examples that can be replicated or adapted by other economies to enhance their technology transfer initiatives. The study of these selected cases allowed for a series of preliminary conclusions that undoubtedly enriched the discussion and raised the level of reflection and subsequent conclusions recognized by the participants. Additionally, some participants brought other case studies to the working tables that undoubtedly highlighted situations that have been fundamental pillars in group work.

The APEC Technology Innovation Management Workshop aimed to analyze existing public policies and practices related to technology transfer and to foster collaboration among Asia-Pacific economies. The event brought together experts, academics, and government representatives to discuss the challenges and opportunities in this field.

A key methodology employed during the workshop was working groups. These interactive sessions allowed participants to delve deeper into specific topics related to technology innovation management. By dividing into smaller groups, participants could discuss case studies, identify best practices, and propose solutions to common challenges.

These working groups fostered a rich exchange of knowledge and experiences, providing participants with a comprehensive understanding of the situation in their respective economies and regions.

The workshop was structured around three core themes: policy frameworks, emerging strategies, and international partnerships. These themes were chosen based on their relevance to the challenges and opportunities faced by APEC economies in technology and innovation.

The first theme, Policy Frameworks, highlighted the importance of developing and implementing effective policies that create an environment conducive to technology transfer and innovation. Effective policy frameworks are seen as the foundation for fostering a supportive ecosystem.

The second theme, Emerging Strategies, focused on the need for APEC economies to adapt to global technological changes. The workshop emphasized adopting innovative strategies to help economies remain competitive in a fast-evolving technological landscape.

Finally, the third theme, International Partnerships, underscored the recognition that no economy, regardless of its size or level of development, can address the challenges of the 21st century in isolation. Discussions centered on the importance of international partnerships to enhance technology transfer and innovation across borders, focusing on bridging the gap between developed and emerging economies within APEC.

2. Methodology

This research employed a mixed-methods approach, combining case study analysis with a participatory workshop. The review of case studies provided a theoretical foundation and enabled the identification of trends and best practices in the field. The workshop, with its participatory approach and group discussions, facilitated the generation of new ideas, the identification of challenges, and the building of consensus among the participating experts. This combination of approaches allowed for a comprehensive understanding of the subject matter, enriching the analysis and producing more robust and reliable results.

2.1. Case Study Report.

This report analyzes public policies and technology transfer practices in selected APEC member economies to identify the best strategies to bridge the gap between research and commercialization of new technologies. Through a comparative study, it seeks to understand how different economies in the region have addressed the challenge of taking innovations from the laboratory to the market. The study's objectives include identifying strategies that have promoted technology transfer, understanding the barriers that hinder innovation commercialization, and formulating recommendations to improve technology management and foster innovation at the domestic level in APEC economies.

The methodology adopted to carry out this study is mainly qualitative, combining documentary review with validations with experts in innovation and technological transfer from different APEC economies. Various complementary tools have been adopted and combined to address the comparative study of STI public policies in APEC economies, which are very diverse in most aspects analyzed. Below is a summary of the different stages of the methodology applied.

In the initial stage, relevant literature and documents on innovation and technology transfer policies and programs in APEC economies were searched, and previous studies, reports of international organizations, and academic publications were identified that provide a theoretical and contextual framework.

Based on these findings, the economies to be included in the present report were selected. One of the most important selection criteria was using the Global Innovation Index 2023. Thus, a representative set of economies with different levels of development and innovation capacities was obtained to get a broad and comparative vision and deliver recommendations that allow for promoting technology transfer in APEC economies.

The case study methodology was used for each economy, which was structured in six sections. The first section addresses the economic context of each economy analyzed. The second section focuses on the main R&D and technology transfer policies. The third section describes the current state of R&D and technology transfer in each economy. The fourth section highlights

an outstanding case of public policies in technology and innovation management. The fifth section highlights an exceptional technology and innovation management program. The last section presents the conclusions and recommendations derived from the analysis. After this, different key actors (Annex II) from the selected economies were identified and contacted to validate the relevance and focus of the case studies.

Data from government reports, academic publications, international databases, and other relevant documents have been identified in the second stage. In addition, the information obtained has been organized and classified as appropriate to the study, such as public policies, innovation programs, and success stories in technology transfer.

These data have been analyzed quantitatively and qualitatively, allowing the coding and thematic analysis of the latter. On the other hand, it has been possible to evaluate quantitative data to identify and compare key indicators between the selected economies and to use tables to visualize the differences and similarities in the economies analyzed.

An important issue in describing the methodologies addressed is to recognize the possible limitations of the study, such as the availability and quality of data, biases in the selection of economies, and the generalizability of the findings. While measures have been taken to mitigate these potential constraints, their existence cannot be overlooked.

The study acknowledges the diversity of development levels among APEC members and the need to consider the specific characteristics of each economy. By comparing the policies and practices of selected economies, it seeks to identify common patterns and best practices that can be replicated in other contexts. Additionally, the report seeks to understand how factors such as investment in research and development, robust innovation ecosystems, and collaboration between the public and private sectors influence the success of technology transfer. The results of this study provided valuable guidance to participants of the APEC workshop, aiming to catalyze the discussions raised.

2.2. Expert Case Study Collection.

Expert case study collection is a qualitative methodology that focuses on obtaining in-depth and detailed knowledge from individuals recognized as experts in a specific field.

To gather successful case studies in technology transfer, a structured format was designed to guide participants in identifying and describing key elements of each case. The program coordinator asked workshop attendees to complete these formats and submit them before the event. The collected data was systematically analyzed, serving as a valuable resource to complement the study's conclusions and recommendations.

2.3. Workshop

A workshop is a structured, collaborative meeting that brings together a group with a common goal. Specific activities and exercises aim to achieve a tangible outcome, such as solving a problem, designing a solution, or creating an action plan.

The APEC Technology Innovation Management Workshop was a two-day event addressing key challenges in technology transfer, innovation management, and international partnerships within the APEC region. The Padlet platform facilitated the workshop's collaborative approach to encourage stakeholder participation and knowledge sharing.

Day 1: Identifying Barriers and Exploring Best Practices On the first day, participants delved into the barriers hindering effective Science and Technology Policy (STP) implementation, such as inconsistent regulations and funding constraints. They also explored best practices in Technology Innovation Management (TIM), including fostering collaboration between academia, industry, and government. Participants identified key challenges through interactive discussions and case studies and shared successful approaches.

Day 2: Advancing Technology Transfer and International Partnerships. The second day focused on strategies for advancing technology transfer and the role of international partnerships in supporting emerging economies. Participants discussed the importance of public-private partnerships, digital innovation hubs, and cross-border collaborations. They also explored challenges and opportunities related to technology transfer, such as intellectual property management and cultural differences. Through interactive sessions and strategic planning, participants developed actionable recommendations to address these challenges and promote innovation.

2.4. Surveys

Surveys are a widely used research tool for collecting information from a group of people. They allow us to understand a specific population's opinions, attitudes, behaviors, and characteristics.

To obtain a comprehensive view of participants' perceptions and experiences, a survey was designed that included various closed-ended and open-ended questions. These questions addressed the main challenges faced in implementing science and technology policies, best practices in innovation management, and opportunities for international collaboration. The results of this survey provided valuable information to complement the qualitative analysis conducted during the workshop.

3. Workshop Overview[1]

The workshop was attended by ten speakers (Annex II) and 27 participants (Annex III) from 8 APEC economies: Chile; China; Indonesia; Malaysia; Peru; Russia; Thailand; and the United States. The event agenda was spread over two days with the following activities in Agenda (Annex I):

On Day 1, after the opening, the speaker, Álvaro Javier Ossa Daurich, presented "*Innovating in Technology and Innovation Management (TIM) Practices in APEC Economies*." The Forum followed this "*Strengthen the link between Academia and Industry for TIM. How to begin?*", featuring speakers Álvaro Ossa (Chile), Luthfina Ariyani (Indonesia), Verónica Montoya (Peru), and David Bridges (USA).

After lunch, the Roundtable Discussion – Interactive Session I was held on the topic "*Science and Technology Policy STP for TIM: Barriers and challenges experiences from APEC Economies*," with the participation of speakers Fairul Azida Shahabudin (Malaysia), Milagros Zavaleta (Peru), and Pavel Corilloclla (Peru).

On the second day, the speaker David Bridges (USA) presented "Science and Technology Policy Framework to Foster." This was followed by the participation of Speaker Halila Faiza (Malaysia), who reflected on "What is Next in Technology Transfer Strategies to Enhance *the Domestic Innovation System? Technology transfer between Academia-Industry.*" Finally, the morning session concluded with the participation of Speaker Pavel Corilloclla (Peru), who presented on "*Large scale international partnerships and their role.*"

After lunch on the second day, the Roundtable Discussion – Interactive Session II was held on the topic "*Experience from APEC Economies on promoting TIM and science and technology framework policies in TT in emerging economies*" with the participation of speakers Ivan Ermokhin (Russia), Eduardo Fuentes (Peru), and Fairul Azida Shahabudin (Malaysia), thus concluding this APEC-organized event.

3.1. Description of the Workshop:

Day 1: Identifying Barriers and Exploring Best Practices

The first day of the workshop was dedicated to identifying the barriers that hinder the effective implementation of Science and Technology Policies (STP) within APEC economies and exploring best practices in Technology Innovation Management (TIM). Moreover, the day continued with a plenary session that set the stage for the discussions, highlighting the critical

[1] Source: APEC Technology Innovation Management Workshop: Final Report. 14-15 August 2024. Lima, Perú. Reported by Joe Lucero. Project Overseed's: David Luján.

importance of STP in driving economic growth and innovation. Participants were then divided into working groups to facilitate more focused and interactive discussions on specific themes.

Key Activities:

● Plenary Session: Experts presented an overview of the current state of STP implementation across APEC economies, identifying common challenges and setting the agenda for the day's discussions. The plenary provided context by discussing global STP trends and APEC's role in fostering innovation.

● Working Group Sessions: Participants were organized into several working groups, each tasked with exploring specific barriers to STP implementation and identifying best practices in TIM. These sessions were highly interactive, with participants sharing their experiences, challenges, and successes.

● Case Study Presentations: Various case studies were presented throughout the day, showcasing successful and unsuccessful STP implementation attempts. These case studies provided concrete examples that helped ground the discussions in real-world experiences.

● Panel Discussions: The day also featured panel discussions, during which officials from various economies and academic experts debated the most pressing issues related to STP and TIM. Topics included the role of government incentives, the importance of regulatory frameworks, and the challenges of fostering industry-academia collaboration.

Day 2: Advancing Technology Transfer Strategies and Exploring International Partnerships

On the second day of the workshop, they were focused on advancing technology transfer strategies and exploring the role of international partnerships in facilitating technology transfer, particularly in emerging economies. Building on the insights from Day 1, the discussions on Day 2 aimed to identify actionable strategies that APEC economies can adopt to overcome the "Valley of Death"—the critical phase between innovation and commercialization where many promising technologies fail to reach the market.

Key Activities:

● Interactive Sessions: The day continued with interactive sessions, during which participants discussed existing technology transfer frameworks and identified gaps that must be addressed. These sessions provided a platform for participants to exchange ideas and propose solutions tailored to the unique challenges faced by their economies.

● Workshops on Technology Transfer Strategies: Specific workshops were held to delve into different aspects of technology transfer, including intellectual property management, early-stage financing, and the role of government in supporting innovation. These workshops were designed to provide practical guidance and share best practices that can be implemented in participants' home economies.

● International Partnership Forums: For most of the day, the topic was how international partnerships can enhance technology transfer in emerging economies. Participants discussed the benefits of joint ventures, cross-border R&D collaborations, and international funding initiatives, with case studies illustrating successful partnerships within the APEC region.

● Strategic Planning Sessions: The day concluded with strategic planning sessions, during which participants worked in groups to develop action plans for implementing the strategies discussed. These plans included timelines, resource requirements, and key performance indicators (KPIs) to measure success.

3.2. Summary of the Presentations

Speaker 1: Innovating in Technology and Innovation Management (TIM) Practices in APEC Economies by Alvaro Javier Ossa Daruich.

Alvaro is a highly qualified Civil Industrial Engineer from the prestigious Universidad Técnica Federico Santa María (USM), Valparaíso, Chile. His knowledge and skills were further honed with a Master's degree in Policies Studies in Education from University College London (UCL), London, United Kingdom, and a Master's degree in Technological and Industrial Business Management from the Escuela de Organización Industrial (EOI) Madrid, Spain.

Alvaro's contributions were recognized when the Chilean government awarded him the title of Tech Transfer Manager of the Year 2017. His expertise is further showcased in his book, “Del Laboratorio al Mercado” (From Lab to Market), published by Ediciones UC in 2021 and available through various platforms, including Amazon and Google Play. Experience in the business development of Start-up companies. Management and administration of innovation programs in medium and large companies, specializing in corporate strategy. Professor in different technological innovation management training programs and entrepreneurship in different regions.

Objectives:

- Presentation of the results obtained during the research phase on the best practices of R&D management, as well as the main findings of conducted case studies and conclusions and recommendations as input for discussion panels.
- To explore and identify best practices to facilitate technology commercialization between the public and private sectors.

The speaker began their presentation by outlining the four main models of technology transfer: Linear Model, Dynamic Model, Triple Helix Model, and Catch-up Model. Additionally, they explained that a study has been conducted on various APEC economies, including Chile; Korea; New Zealand; Peru; Singapore; Thailand; and the United States, using a variety of methodologies. The study has analyzed key economic indicators and those related to Science and Technology for each of these economies to enable a comparison of the public policies

implemented in STI and to obtain initial conclusions that served as input for the discussions to be held in the workshop.

Forum: Strengthen the link between Academia and Industry for TIM. How to begin?

Speakers: Alvaro Javier Ossa Daruich (Chile), Luthfina Ariyani (Indonesia), Verónica Montoya (Perú) and David Bridges (USA)

Luthfina Ariyani (Indonesia), or Fina, currently serves as a Researcher at the Research Center for Economics of Industry, Services, and Trade at the National Research and Innovation Agency, Indonesia. She earned her Master's in Industrial Engineering from Gadjah Mada University Indonesia in 2016. Fina is part of the Innovation Management and Industrial Competitiveness Research Group, with a research interest in Technology and Innovation Management and Micro, Small, and Medium Enterprises (MSMEs). She has published several papers in proceedings and journals. One of her relevant articles is ‘Conceptualizing a Seamless Model of Technology Transfer: Evidence from Public Research Institutes and Universities in Indonesia.’

Veronica Montoya (Peru). Economist from the Pontificia Universidad Católica del Perú (PUCP). She holds a Master's Degree in Management and Policies of Innovation and Technology and a diploma in Corporate Social Responsibility. She was Director of Research, Development, Innovation, and Technology Transfer of the Instituto Tecnológico de la Producción. She has been head of the Innovation Office of the Directorate of Research Management of the PUCP. She coordinated and promoted projects for

entrepreneurs/innovators at the Center for Innovation and Entrepreneurial Development (CIDE - PUCP). Part-time lecturer of innovation and technology management courses, technology transfer and evaluation, university, business, government, and R&D&I project management.

David Bridges – USA. David Bridges leads the Enterprise Innovation Institute (EI2), the socio-economic development arm of Georgia Tech. The organization has 12 core programs and is the largest economic development organization at any U.S. university, with 150 research faculty. EI2 operates in the U.S. and has served over 34 economies on five continents. David has authored or co-authored over 135 economic development grant proposals, cooperative agreement proposals, and white papers totaling USD154 million in awarded funding. He has acted as principal investigator on USD35 million in grants with nine U.S. federal agencies and numerous international funders. He pioneered the EI2 Innovation Ecosystem Engine model, leading to a new center for Georgia Tech in Medellin, Colombia. David has worked in over 20 economies, expanding manufacturing, innovation, and technology valorization capacity. He is a Fulbright Specialist in innovation ecosystem building and actively working in Slovakia.

Objective: The speakers, government official representatives, and technology and innovation experts at universities and R&D institutes will share experiences on successful technology and Innovation management and analyze new strategies to promote academia-industry technology transfer.

Speaker 2: Science and Technology Policy framework to foster technology transfer between Academia-Industry by David Bridges (USA)

The speaker began their presentation by outlining the contents: EI2 (Enterprise Innovation Institute) Overview, Tech Transfer and Policy, Innovation Ecosystems, Startup Ecosystems, and Cluster Building.

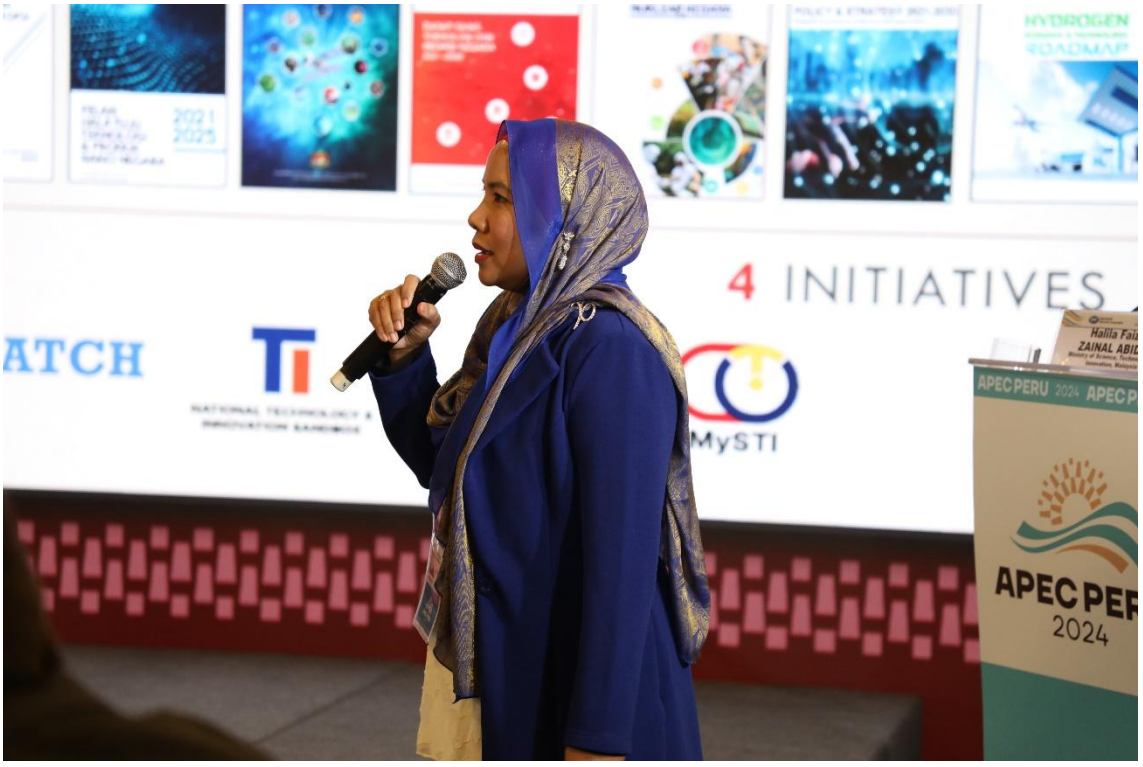
He started by examining EI2's vision and mission. Then, he dived into Technology Transfer, discussing its purpose, policy implications, and role within the Innovation Ecosystem, emphasizing the Quadruple Helix model. After that, he focused on Peru's specific case and concluded with an overview of his institution and its achievements.

Speaker 3: What is next in Technology Transfer Strategies to enhance the Domestic Innovation System? By Halila Faiza (Malaysia)

Halila Faiza Zainal Abidin (Malaysia) is a Principal Assistant Secretary of the Technology Transfer and R&D Commercialization Division at the Ministry of Science, Technology and Innovation. Halila has been with the Ministry of Science, Technology and Innovation (MOSTI) since 2011 as an Administrative and Diplomatic Officer, serving multiple departments including Malaysian Space Agency, Funding Division, Human Resource, and at present with the Technology Transfer and R&D Commercialization Division. Halila has worked on developing and implementing various science, technology, innovation, and commercialization policies. Currently, she leads two (2) pilot domestic initiatives, the Tech Roll Out and the Adoption of Malaysian R&D Products in the Government Procurement program. Her PhD

research was in the Nanotechnology Law, focusing on Nanosafety for Workers (2019). Halila began her career as an advocate and solicitor in 2003 before joining the Government of Malaysia with her first posting at the Public Service Department.

The expert presented the conditions related to instruments or STPs aimed at creating the appropriate conditions for technology transfer between academia and industry with a view to commercialization. They also presented applied examples in APEC economies and their lessons learned, which served as input for the second interactive activity.



Speaker 4: Large-scale international partnerships and their role in TT in emerging economies. By Pavel Corilloclla (Peru)

Pavel Corilloclla Terbullino (Perú). He has a Ph.D. in Science and Technology Policy Studies from the Science Policy Research Unit (SPRU) at the University of Sussex (UK), a Master in Public Policy from the University of Chile, and a Bachelor in Law and Political Science from the Universidad Nacional Mayor de San Marcos (Peru). He has been a visiting scientist at the Fraunhofer Institute for Systems and Innovation Research (Germany). As a researcher, he has developed research projects related to barriers to university-industry linkages, international partnerships, innovation intermediaries, systems of innovation, and STI policy and research in several economies such as Peru, Chile, and Germany. As a practitioner, Pavel has been recently involved in a series of consultancy services regarding science, technology, and innovation policy issues for Peruvian and international organizations such as UNESCO, GIZ, the Office of the Peruvian Prime Minister Office, the Ministry of Production, CONCYTEC, the Ministry

of Education, UNESCO, The World Tourism Organization, as well as local governments and universities.

The presentation was guided by a series of thought-provoking titles and questions: 1—Internationalization of domestic innovation systems; 2—Large-scale international partnerships to Foster STI capabilities; and 3—How can emerging economies benefit from these international partnerships? Additionally, the situations in Chile and Peru regarding internationalization activities were compared. Finally, the presentation concluded with brief but forceful conclusions about the topic.

Speaker 5: Data as the fuel for business and academia cooperation. By Ivan Ermokhin

Ivan Ermokhin is a researcher at the Foreign Trade Academy and Deputy Head of Laboratory of International Best Practices, Gaidar Institute for Economic Policy. He is team leader of the multiple research and analytical projects for the Government, Ministries and Development Finance Institutions in Russia and Eurasian Union. Primary sphere of interest is international and comparative law with focus on investment and entrepreneurship, digitalization, and sustainable finance.

Ivan Ermokhin worked closely with OECD and was a part of Russian delegation at Investment Committee, Committee for Science and Technological Policy, Committee on Financial Markets, and others. He also worked with BRICS economies and was a team leader at drafting the BRICS Declaration on Responsible Investment Principles 2020. Currently he leads a research team and provides consultancy work for the Russian chairmanship in BRICS and

focuses his studies on several topics, including the questions of AI regulation, the future of carbon credits, and transitional finance in BRICS and others.

The presentation highlighted that while significant data has been collected, its processing and utilization remain suboptimal. Data processing rates are currently below 50%, and accessibility to this valuable data remains limited. To address these challenges, the speaker proposed a suite of tools aimed at streamlining data flow between the public sector, academia, and the private sector.

3.3. Summary of the Discussions

The workshop discussions were extensive and insightful, covering many issues related to STP implementation, TIM, and international partnerships. Below is a more detailed summary of the key points raised during the discussions.

Day 1 Discussion

Barriers to STP Implementation:

● Participants engaged in deep discussions about the barriers that impede the effective implementation of STPs across APEC economies. The lack of consistent regulations was highlighted as a critical issue, with some economies having overly restrictive policies while others lacked the necessary regulatory frameworks to support innovation. Funding constraints were also a major concern, particularly for SMEs that struggle to secure financing for R&D projects. Cultural and institutional differences were frequently cited as obstacles to collaboration, with participants noting that these differences often lead to misaligned objectives and ineffective communication.

Best Practices in TIM:

● The importance of collaboration between academia, industry, and government was a recurring theme. Participants discussed various collaboration models, including formalized partnerships, joint ventures, and consortia, and highlighted examples where such collaborations had led to significant technological advancements. The development of innovation ecosystems was also emphasized, with participants noting that these ecosystems provide the necessary support for startups and facilitate the commercialization of new technologies. Talent development was another key topic, with participants recognizing the need for continuous investment in education and training to build a workforce capable of sustaining long-term innovation.

Day 2 Discussions

Technology Transfer Strategies:

● On the second day, participants focused on identifying strategies to enhance technology transfer within APEC economies. Public-private partnerships were seen as a key strategy, with participants discussing how these partnerships can be structured to maximize the strengths of both the public and private sectors. Establishing digital innovation hubs was also highlighted as a critical strategy, with participants noting that these hubs provide a collaborative environment where innovation can thrive. Cross-border collaborations were recognized as essential for enhancing global competitiveness, with participants discussing how such collaborations can facilitate the transfer of knowledge and technologies across borders.

International Partnerships:

● The role of international partnerships in facilitating technology transfer was a major focus of discussion. Participants explored how large-scale partnerships can bridge the technological gap between developed and emerging economies, enabling emerging economies to access advanced technologies and enter new markets. While the benefits of international partnerships were clear, participants identified several challenges, including managing intellectual property rights, navigating cultural differences, and ensuring equitable resource distribution. Despite these challenges, the opportunities for growth through shared R&D facilities, capacity-building programs, and joint ventures were seen as substantial.

Summary of Wrap-Up Session

The wrap-up sessions on both days of the workshop provided an opportunity to consolidate the discussions and highlight the key recommendations that emerged. Below is a detailed summary of the wrap-up sessions and the recommendations made.

Harmonize Regulatory Frameworks: One key recommendation was harmonizing regulatory frameworks across APEC economies. Participants emphasized that aligning regulations would reduce barriers to innovation and create a more cohesive environment for technology transfer. Harmonization would also help create a more predictable and supportive regulatory landscape, encouraging greater investment in R&D and facilitating cross-border collaborations.

Invest in Strategic Areas: Another major recommendation was to increase R&D funding, particularly in high-potential sectors such as artificial intelligence, biotechnology, and clean energy. Participants stressed that targeted investments in these areas would drive innovation and position APEC economies at the forefront of global technological advancements. The need for increased funding was particularly emphasized for high TRL projects, which often face significant challenges in securing financing.

Foster International Partnerships: Encouraging equitable collaborations through international partnerships was identified as a key strategy for supporting emerging economies and driving global innovation. Participants highlighted the importance of developing joint ventures, cross-border R&D collaborations, and international funding initiatives to facilitate technology transfer and enhance global competitiveness. The need for clear legal frameworks to manage intellectual property rights and ensure equitable resource distribution was also emphasized.

Overcome the Valley of Death: Participants recommended implementing targeted funding programs, mentorship initiatives, and early-stage investment support to bridge the gap between research and commercialization. These strategies are essential for ensuring that innovations successfully transition from the lab to the market. Participants also discussed the need for capacity-building programs to develop the skills and expertise required to manage the commercialization process.

Promote Talent Development: Continuous investment in education and training was identified as critical for building a skilled workforce capable of sustaining long-term innovation. Participants emphasized the need for talent development programs that align educational outcomes with industry needs and support the retention of skilled professionals in STI fields. The importance of fostering leadership and management capabilities in technology and research was also highlighted.

Develop Innovation Ecosystems: Developing comprehensive innovation ecosystems was emphasized as a best practice for nurturing startups and facilitating the commercialization of academic research. Participants highlighted the importance of creating incubators, science parks, and technology transfer offices that provide the necessary infrastructure and support for innovation to thrive.

Enhance Cross-Border Collaborations: The importance of cross-border R&D collaborations was underscored, with participants discussing how such collaborations can enhance the global competitiveness of APEC economies. These collaborations allow for the pooling of resources and expertise, enabling economies to tackle large-scale challenges that would be difficult to address individually. Participants also highlighted the role of cross-border collaborations in facilitating knowledge transfer and technologies to less-developed regions within APEC.

The workshop concluded with a collective acknowledgment of the importance of ongoing collaboration among APEC economies. The insights and recommendations generated during the event will serve as a roadmap for enhancing technology transfer, driving innovation, and building more resilient and dynamic economies across the APEC region. Participants expressed their commitment to continuing the dialogue and working together to implement the strategies discussed during the workshop.

3.4. Workshop Summary Key Results

Technology transfer and innovation management are crucial for APEC economies' economic growth and sustainable development. A recent workshop brought together experts and representatives from various economies in the region to analyze the challenges and opportunities in this area. Participants identified several barriers that hinder the effective implementation of science and technology policies and successful practices that can serve as models. The results of this workshop provide a comprehensive overview of the current situation and offer recommendations to drive innovation in the region. Key Barriers Identified:

● Inconsistent Regulations: Participants identified the lack of regulatory alignment across APEC economies as a significant barrier to effective STP implementation. This inconsistency creates challenges in developing and applying innovation strategies that are both efficient and widely applicable across different contexts. For instance, some economies have stringent regulations that inhibit the flexibility needed for rapid innovation, while others lack the necessary regulatory frameworks to support emerging technologies.

● Funding Constraints: Another major challenge identified was the scarcity of financial resources dedicated to innovation, particularly for high Technology Readiness Level (TRL) projects closer to commercialization. Participants discussed the difficulties SMEs face in accessing funding for R&D, which is often limited to larger firms or sectors deemed of domestic importance.

● Cultural and Institutional Differences: The discussions also highlighted the challenges of cultural and institutional differences between academia, industry, and government. These differences can lead to misaligned objectives, communication barriers, and a lack of trust, all of which impede effective collaboration. For example, academic institutions might prioritize publishing research, while industry partners focus on commercial outcomes, leading to conflicting expectations and goals.

● Talent Retention: The difficulty retaining skilled professionals in research and development roles was also noted as a critical issue. Many APEC economies struggle with brain drain, where talented individuals migrate to economies offering better opportunities, leaving gaps in the local innovation ecosystem. Participants emphasized the need for mechanisms to support career development and retention in STI fields.

Best Practices in Technology Innovation Management:

● Collaboration Models: Successful collaboration between academia, industry, and government was identified as a cornerstone of effective TIM. Examples from economies such as the USA demonstrated how strong, institutionalized partnerships can drive innovation. These models often involve structured interactions, such as industry-sponsored research projects, government-funded innovation clusters, and public-private partnership (PPP) frameworks that incentivize collaboration.

● Development of Innovation Ecosystems: Creating comprehensive innovation ecosystems was emphasized as a best practice. These ecosystems include incubators and technology transfer offices that provide the infrastructure and support needed for startups and emerging technologies. Participants highlighted examples from economies like Indonesia, where ecosystems have significantly contributed to the commercialization of academic research.

● Talent Development: Continuous investment in education and training programs was recognized as critical for building a workforce capable of sustaining long-term innovation. The importance of developing technical skills and fostering leadership and management capabilities in technology and research was underscored.

Key Technology Transfer Strategies:

● Public-Private Partnerships (PPPs): The role of PPPs in facilitating technology transfer was a major focus of discussion. Participants explored how these partnerships can be structured to maximize the strengths of both sectors while mitigating risks. Examples included government-

led initiatives that provide seed funding to startups, matched by private sector investments, or co-managed innovation hubs that bring together researchers, entrepreneurs, and investors.

● Digital Innovation Hubs: Establishing digital innovation hubs was highlighted as a critical strategy for supporting the development and commercialization of new technologies. These hubs provide a collaborative environment where stakeholders can collaborate on innovation projects, supported by state-of-the-art facilities and access to funding and mentorship.

● Cross-Border Collaborations: The importance of cross-border R&D collaborations was underscored, with participants discussing how such collaborations can enhance the global competitiveness of APEC economies. These collaborations allow for the pooling of resources and expertise, enabling economies to tackle large-scale challenges that would be difficult to address individually. Participants also highlighted the role of cross-border collaborations in facilitating knowledge transfer and technologies to less-developed regions within APEC.

International Partnerships in Emerging Economies:

● Bridging the Gap: Large-scale international partnerships were identified as vital for bridging the technological gap between developed and emerging economies. These partnerships enable emerging economies to access advanced technologies and enter new markets, accelerating their integration into the global economy. Participants discussed successful examples, such as partnerships between universities in developed economies and research institutes in emerging markets. These have led to significant advancements in areas like renewable energy and biotechnology.

● Challenges and Opportunities: While the benefits of international partnerships were clear, participants identified several challenges, including managing intellectual property rights, navigating cultural differences, and ensuring equitable resource distribution. Despite these challenges, the opportunities for growth through shared R&D facilities, capacity-building programs, and joint ventures were seen as substantial. Participants proposed several strategies to address these challenges, such as establishing clear legal frameworks for collaboration, promoting cultural exchange programs, and developing mechanisms to ensure that the benefits of partnerships are fairly distributed.

The workshop results on innovation management and technology transfer in APEC economies demonstrate that the region has great potential to become a global leader in innovation. However, to achieve this goal, several challenges must be overcome, and existing opportunities must be seized. The workshop recommendations provide a clear roadmap for a more innovative and prosperous future. By implementing these recommendations, APEC economies can strengthen their global competitiveness and improve the quality of life of their citizens.

4. Limitations of the Study

This study examines the challenges and opportunities in promoting academia-industry technology transfer within APEC economies. Drawing on expert presentations and workshop discussions, the analysis explores the factors influencing successful technology transfer and identifies areas for improvement. While the study provides valuable insights, it is important to acknowledge its limitations, which arise from the nature of the data collection methods and the sample of participants involved.

- Expert Presentations:
  - Subjectivity: Information presented can be based on the expert's perspective.
  - Lack of generalization: Conclusions may not apply to other situations or contexts.
  - Difficulty integrating multiple perspectives: In panels with multiple experts, it can be challenging to synthesize different opinions.
- Workshop Discussions:
  - Dominance of certain participants: Some individuals may dominate the conversation and limit the participation of others.
  - Difficulty reaching a consensus: It is not always possible to reach a unanimous agreement among all participants.
- Surveys:
  - Bias in responses: Respondents may lie, exaggerate, or answer in a socially desirable way.
  - Difficulty reaching the entire population: It may not be possible to obtain a representative sample of the target population.
  - Limitations in the depth of responses: Closed-ended questions may not allow deep exploration of topics.

These limitations are common to most studies and cannot be entirely avoided. While we have taken steps to minimize them in this particular study, we acknowledge their potential presence.

This report presents an exploratory analysis of public policies and programs to promote academia-industry technology transfer within APEC, based on presentations from invited experts and discussions at the workshop. While these contributions offer valuable qualitative insights into industry experiences and challenges, it is important to acknowledge that the collected information is based on a non-probabilistic sample limited to event participants. The absence of representatives from some APEC economies restricts the generalizability of the findings and may bias the conclusions. For future research, it is recommended that this approach be complemented with surveys of a broader sample of relevant actors in the APEC innovation ecosystem. This would enable a more comprehensive and representative understanding of the trends and challenges in the field.

5. Case Study Insights: Best Practices for Technology Transfer

This section presents insights from case studies of selected APEC economies, highlighting good practices and lessons learned in technology transfer by some APEC economies.

The selected economies aim to cover a spectrum of possibilities and geographies to achieve relevance in the comparative study of the chosen economies' STI policies.

In this case, the following economies are proposed to be studied: Chile; the Republic of Korea; New Zealand; Peru; Singapore; Thailand; and the United States. Thus, the United States geographically covers North America and is also one of the most solid members at the level of public policies in STI, with a long history and an absolutely consolidated ecosystem, with R&D being one of the most important engines of the domestic economy.

Then, with the selection of Chile and Peru, two members that geographically cover South America are included, with developing economies and where a series of changes and proposals are being forged at the STI level to give the necessary boost to R&D so that it becomes a pillar on which the economic growth of the chosen members rests.

New Zealand offers to geographically cover the southwest Pacific and the continent of Oceania, where there is a stable economy. Certain attempts are being made in R&D to diversify the local economy and generate growth based on knowledge and new technologies.

On the other hand, Singapore and Thailand cover Southeast Asia, a developed economy and a developing economy that, although very close, offer two completely different R&D perspectives that make their study interesting. It is interesting to see how their governments have adopted different paths to achieve the growth of their respective economies.

Finally, the Republic of Korea's selection covers East Asia geographically. Its geographical position and proximity to China and Japan make it an interesting case study, putting into perspective the decision taken by this economy in the area of R&D that has led it to achieve sustained growth over the last decades.

All these APEC economies also enjoy different positions in the Global Innovation Index (GII), which allows for a wide panorama of various stages of development. This makes the comparison between them even richer and allows us to clearly establish what all of them adopt good practices.

In summary, the selection of economies for this study provides a diverse representation of STI policies across different regions and levels of development. By including advanced economies such as New Zealand and the United States and developing economies such as Chile and Peru, broad perspectives are gained on how innovation policies and programs can be designed and implemented to boost economic growth. The analysis of Singapore and Thailand adds valuable insight into the differences in R&D approaches in Southeast Asia. At the same time, the Republic of Korea offers insight into the sustained impact of strategic policies in East Asia.

The comparison between these economies allows the identification of good practices and common challenges and the adaptation of STI strategies to specific contexts, thus promoting more effective technology transfer and balanced economic development in the APEC region.

United States

The United States boasts a strong and dynamic Science, Technology, and Innovation (STI) ecosystem underpinned by the excellence of its institutions, the quality of its human capital, and a supportive environment that fosters innovation. This robust system has enabled the members to maintain leadership across various fields, generating significant economic and social benefits.

One key strength of the U.S. STI ecosystem is the abundant funding available for research and development. The federal government and private companies invest substantial amounts of money into R&D, ensuring a steady flow of resources to fuel innovation. This financial support is complemented by a culture of public-private collaboration, where close partnerships between government, universities, and companies facilitate the transfer of technology and the commercialization of new products and services. These collaborations are vital for translating research into practical applications that drive economic growth.

Another critical element of the U.S. innovation landscape is its strong patent system, which provides robust protection for intellectual property. This system incentivizes investment in research and development by ensuring that inventors and companies can secure the rights to their innovations, thereby encouraging further exploration and commercialization of new technologies. Additionally, the United States has cultivated a culture of innovation characterized by a high valuation of creative solutions and a tolerance for failure. This mindset encourages risk-taking and experimentation and supports the iterative process necessary for successful technology transfer and the advancement of new ideas.

Singapore

Singapore has successfully developed a Science, Technology, and Innovation (STI) ecosystem that is both consolidating and dynamic, playing a crucial role in its economic development. By combining significant investments in education, research and development, a culture of innovation, and supportive government policies, Singapore has positioned itself as a global leader in technology.

One key practice underpinning Singapore's success is its commitment to long-term strategic planning. The Singaporean government has implemented comprehensive strategic plans to foster innovation and technological development, resulting in substantial progress. These plans provide a clear vision for the economy's future in STI, guiding investments and initiatives that align with domestic priorities.

Singapore also offers a highly favorable business environment with low taxes, efficient bureaucracy, and robust intellectual property protections. This environment attracts local and international businesses and encourages innovation by providing a stable and supportive

landscape for enterprises to thrive. The ease of doing business in Singapore has been a significant factor in its ability to attract and retain global talent and investments in technology.

Collaboration between government, academia, and industry is another cornerstone of Singapore's STI ecosystem. This tripartite collaboration has facilitated technology transfer and commercialized new products. By fostering strong connections between these sectors, Singapore has bridged the gap between research and the market, ensuring that innovations are effectively translated into economic value.

Moreover, Singapore has made substantial investments in research infrastructure, providing state-of-the-art facilities that enable researchers to work under optimal conditions. This investment supports a high level of research activity, driving technological advancements and bolstering the economy's reputation as a hub of innovation.

Republic of Korea

The Republic of Korea has developed a robust and highly dynamic Science, Technology, and Innovation (STI) ecosystem pivotal to its economic success. Through substantial investments in education, research, and development, coupled with a strong work ethic and a focus on innovation, the Republic of Korea has emerged as a global leader in technology.

One key element of the Republic of Korea's approach is its commitment to long-term strategic planning. The government has implemented comprehensive plans to foster innovation and advance technological development. These strategic initiatives have provided a clear direction for the member's STI growth, ensuring that efforts are well-coordinated and aligned with domestic goals.

The strong collaboration between academia, industry, and government is a major strength of the Republic of Korea’s STI ecosystem. This tripartite relationship has facilitated technology transfer and commercialized new products. By strengthening ties between universities, companies, and government entities, the Republic of Korea has created a cohesive environment where innovation can thrive and research can be effectively translated into market-ready solutions.

Investment in research infrastructure has also been a cornerstone of the Republic of Korea’s strategy. This member has invested significantly in building state-of-the-art research laboratories and acquiring advanced scientific equipment. This commitment to high-quality research facilities has enabled Korean researchers to conduct cutting-edge work, drive technological advancements, and maintain the economy's competitive edge in global markets.

Furthermore, the Republic of Korea has focused on fostering entrepreneurship as a key component of its economic strategy. The government has implemented policies to encourage the creation of technology-based startups, recognizing the importance of entrepreneurship as a driver of innovation and growth. Although there have been challenges in fully establishing this pillar, the Republic of Korea remains dedicated to strengthening its entrepreneurial ecosystem as a vital contributor to its overall economic development.

New Zealand

New Zealand has developed a Science, Technology, and Innovation (STI) ecosystem that is steadily consolidating and expanding. It is characterized by its dynamism and a strong focus on collaboration, investment in research, and the development of highly skilled human capital. This strategic approach has enabled New Zealand to become a global leader in innovation, particularly in specific areas of technological development.

A key aspect of New Zealand's STI ecosystem is its emphasis on applied research. By prioritizing research that addresses real-world problems and generates tangible economic benefits, New Zealand has aligned its innovation efforts with practical outcomes that drive societal and economic growth. This focus on application ensures that research activities are closely linked to the needs of industries and communities.

Public-private collaboration is another cornerstone of New Zealand's success in fostering innovation. The close partnership between government, universities, and businesses has been critical in facilitating the transfer of knowledge and technology, allowing for the commercialization of new products and services. This collaborative model enhances members' ability to leverage collective expertise and resources, further strengthening its innovation system.

Investment in human capital is also a significant element of New Zealand's strategy. The government has made substantial investments in the education and training of researchers, recognizing that a highly skilled workforce is essential for sustaining innovation. While progress has been made, ongoing efforts are needed to fully develop this area and maximize the potential of New Zealand's human resources.

Additionally, New Zealand has strongly emphasized sustainability, integrating environmental considerations into its development strategies. This sustainable approach has fueled innovation in clean energy and sustainable agriculture sectors, positioning the member as a leader in green technologies and environmentally friendly solutions.

Thailand

Thailand is actively working to strengthen its innovation ecosystem and position itself as a regional leader in technology. Although the economy still faces some challenges, it possesses strong potential to achieve this ambitious goal through targeted initiatives and strategic investments.

One key strategy that Thailand has adopted is fostering public-private partnerships. The Thai government has proactively promoted collaboration between the public sector, private companies, and academic institutions to drive innovation and facilitate technology transfer. These partnerships are crucial in bridging the gap between research and commercialization, enabling new technologies to reach the market more effectively.

Investment in infrastructure is another significant component of Thailand's approach to building its STI ecosystem. The government has invested considerably in constructing state-of-the-art research laboratories, providing researchers and innovators with the facilities to conduct advanced scientific and technological work. These infrastructure investments not only support current research activities but also help attract international collaborations and investments.

Furthermore, Thailand has focused on encouraging entrepreneurship as a vital part of its innovation strategy. The government has implemented policies designed to foster entrepreneurship and support the creation of new businesses. These initiatives aim to cultivate a vibrant startup ecosystem, providing aspiring entrepreneurs with the resources, support, and regulatory environment necessary to launch and grow their ventures.

Chile

Chile has made significant strides in strengthening its Science, Technology, and Innovation (STI) system, laying a solid foundation for further development. However, continued efforts are necessary to consolidate these achievements and address the remaining challenges to fully realize the economy’s innovation ecosystem's potential.

One of the key strengths of Chile’s approach is its commitment to a consistent domestic policy aimed at bolstering the STI system. The Chilean government has clearly focused on advancing science, technology, and innovation as pillars of domestic development, demonstrating a long-term vision supporting these sectors' growth.

Financing has also played a crucial role in the evolution of Chile's STI landscape. The increase in public and private research and development investment has been fundamental to the sector’s growth. Despite this progress, there remains a strong need for further funding expansion to fully capitalize on Chile’s innovation ecosystem's potential. A decisive commitment to increasing investment will be key to sustaining momentum and driving continued advancements.

International collaboration has been another important element of Chile’s strategy. Partnerships with foreign institutions and researchers have enriched domestic research activities, providing access to new technologies and cutting-edge knowledge. These collaborations enhance the quality of Chilean research and help integrate the economy into global innovation networks, opening opportunities for further technological exchange and development.

Perú

Peru has made notable progress in strengthening its Science, Technology, and Innovation (STI) system, but significant work remains to realize its full potential. To consolidate these advances, it is crucial to continue investing in research, enhancing collaboration among the various actors within the system, and fostering a culture of innovation across society.

A key aspect of Peru's approach has been implementing domestic policies promoting science, technology, and innovation. The Peruvian government has introduced a range of initiatives designed to boost the STI sector, demonstrating a commitment to integrating science and technology as central components of domestic development.

Public-private collaboration is another critical area in which Peru has focused its efforts. Strengthening the ties between the Public Administration, universities, and companies is essential for driving innovation and ensuring that research outputs are effectively translated into marketable products and services. This articulation between public and private entities helps to bridge gaps, align goals, and create a more cohesive and productive innovation ecosystem.

Investment in human capital formation is also a fundamental pillar of Peru's strategy. By prioritizing the training and development of researchers and scientists, Peru aims to build a skilled workforce capable of advancing the domestic's scientific and technological ambitions. Developing a robust human capital base is essential for sustaining long-term growth and fostering a resilient STI ecosystem.

Below are tables with the main indicators that provide a comparative overview between the selected economies. The data is organized in three key tables: the "Comparative Table of Main Indicators for Selected Economies in 2023", the "Comparative Table of the General Innovation Context," and the "Comparative Table of the Main Aspects of the STI Policies Examined." These tables provide a structured comparison, highlighting the differences and similarities in innovation performance, policy context, and key science, technology, and innovation (STI) strategies between the economies analyzed.

	USA	**Singapore**	**Republic of Korea**	**New Zealand**	**Thailand**	**Chile**	**Peru**
GDP (USD Billions)	27360	501.43	1710	253.47	514.94	335.53	267.60
GDP per Capita (USD)	81695	84734	33121	48527	7171	17093	7789
GDP growth	2.5%	1.1%	1.4%	0.6%	1.9%	0.2%	-0.6%
Unemployment rate	3.6%	3.5%	2.6%	3.7%	0.9%	9.0%	4.8%
Annual inflation	4.1%	4.8%	3.6%	5.7%	1.2%	7.6%	6.5%
R&D (% PBI)	3.5%	2.2%	4.9%	1.45%	1.3%	0.36%	0.22%
Foreign Direct Investment	1.5%	29.8%	1.5%	3.4%	2.3%	6.9%	4.4%

Table 1- Comparative table of main indicators selected economies in 2023[2]

[2] Source Indicators World Bank Data 2023 and WIPO: GII 2023.

A comparative table of the general innovation context in the studied members is presented.

	USA	SINGAPORE	REPUBLIC OF KOREA	NEW ZEALAND	THAILAND	CHILE	PERU
INVESTMENT IN R&D	Greater global investment, both public and private.	High, significant government investment	Historically high, with an emphasis on technology sectors.	Moderate focus on sustainability	Growing, focus on strategic sectors	Down from the APEC average	Down from the APEC average
UNIVERSITY SYSTEM	The largest and most diverse in the world, with numerous world-renowned universities.	World-class, with a strong focus on applied research	High-quality, with an emphasis on STEM	Solid, Applied Research Focus	In development, with public and private universities. Increase in STEM graduates.	Solid, in development	In development
INNOVATION ECOSYSTEM	It is highly developed, with many startups, incubators, and accelerators.	Dynamic, with a competitive startup ecosystem	Mature, with large conglomerates and open innovation	Emerging, with a focus on sustainability and clean technology	Growing, with an emphasis on tourism and technology	Consolidating in some sectors, developing in others	In development
ECONOMIC APPROACH	Wide range of sectors, including technology, biotechnology, aerospace, etc.	Finance, logistics, electronics, biomedicine	Electronics, automotive, shipbuilding, and information technology.	Agriculture, tourism, clean technology	Tourism, manufacturing, agriculture, and technology	Mining, energy	Diverse
POLITICAL AND ECONOMIC STABILITY	Stable and diversified economy with a large domestic market.	High stability, open economy	Relative stability, industrialized economy	Loud	Relative stability, economic challenges	Stable	In development
HUMAN CAPITAL	The large talent pool attracts researchers from all over the world.	Highly educated, with proficiency in languages and technical skills	Highly educated, with a strong work ethic	Qualified, with an emphasis on sustainability	Growing workforce, with an emphasis on tourism and manufacturing	Growing in STEM	Growing in STEM with Retention Challenges

Table 2- Comparative Table General Context of Innovation

Below is a comparative table between the economies described above.

Economy	Main focus	Strengths	Challenges	Hallmarks
United States	Global technology leadership and business innovation focus on basic research.	World's largest economy, world-class universities, dynamic startup ecosystem.	Social inequality, political polarization, and growing competition from other economies.	Innovation model driven by the private sector and universities.
Singapore	Development of a world-class innovation ecosystem, focusing on strategic sectors.	Strong investment in research and development, dynamic startup ecosystem, and efficient governance.	Limited domestic market size and dependence on foreign skilled labor.	Successful public-private collaboration model.
Republic of Korea	The development of large industrial conglomerates (chaebols) focuses on electronics and automotive.	Powerful manufacturing industry, high capacity for innovation, high-quality educational system.	Dependence on exports, high global competition.	Corporation-driven development model.
New Zealand	Sustainable development, focus on agriculture and clean technologies.	The unique natural landscape, high quality of life, and focus on innovation.	Small market size, dependence on commodity exports.	Focus on sustainability and cross-sector collaboration.
Thailand	Development of strategic sectors such as biotechnology and tourism and regional integration.	Rich cultural diversity, tourist potential, and strategic location.	Social inequality, bureaucracy, dependence on foreign investment.	Balance between tradition and modernity.
Chile	Development of basic research and strengthening of public-private collaboration.	Economic stability, natural resources, growing middle class.	Social inequality, dependence on basic products.	Focus on basic research and international collaboration.
Peru	Solving local problems and strengthening local capacities.	Geographic and cultural diversity, natural resources, and growing middle class.	Social inequality, deficient infrastructure.	Focus on the resolution of local problems and articulation with the productive sectors.

Table 3 - Comparative Table of the main aspects of the STI Policies examined.

6. Recommendations in STP policy and TIM

Based on a thorough analysis that included a review of case studies and expert contributions from the APEC Technology Innovation Management Workshop, this report provides key recommendations for promoting innovation and technology transfer within APEC economies. These recommendations focus on critical areas such as talent development, investment in research and development (R&D), and the establishment of harmonized regulatory frameworks. By prioritizing these areas, APEC members can play a significant role in enhancing their global competitiveness, improving the quality of life of their citizens, and addressing pressing global challenges. The following section outlines the main recommendations to foster technology transfer in the APEC economies.

Promoting Talent Development[3]

A skilled workforce is a luxury necessary for driving innovation and sustaining long-term economic growth. The time to invest in education and training programs that align with industry needs is now. This will help develop the talent necessary to support technological advancements.

Key Benefits of Talent Development:

- Innovation Capacity: A skilled workforce is essential for driving innovation and developing new technologies. By investing in education and training, APEC members can cultivate a pool of talented individuals capable of solving complex problems and creating innovative solutions.
- Economic Growth: A skilled workforce can contribute to economic growth by increasing productivity, attracting investment, and creating new jobs.
- Global Competitiveness: A well-educated and skilled workforce is essential for maintaining a competitive edge in the global economy.
- Improved Quality of Life: Investing in talent development can improve quality of life by creating opportunities for individuals to realize their full potential and contribute to society.

Strategies for Promoting Talent Development:

- Align Education with Industry Needs: Collaborate with industry leaders to ensure that educational programs are relevant and prepare graduates for the skills required by the workforce.

[3] This is a shared issue in APEC economies. Thus, according to the recommendations of the Case Studies report, the USA is an example of aligning education with industry needs, fostering lifelong learning, and generating talent retention strategies. However, this point is a recurring deficiency in other economies. Furthermore, this topic was discussed on the first day and in the wrap-up session of the workshop.

- Support Retention of Skilled Professionals: Implement policies and initiatives to retain skilled professionals in STI fields, such as competitive salaries, flexible work arrangements, and opportunities for professional development.
- Foster Leadership and Management Capabilities: Develop programs to cultivate leadership and management skills among technology and research professionals. This will help ensure that innovative ideas are effectively translated into commercial products and services.
- Encourage Lifelong Learning: Promote a culture of lifelong learning to help individuals stay up-to-date with the latest technological advancements and industry trends.

Promoting STEM Education[4]

STEM education (Science, Technology, Engineering, and Mathematics) is crucial in nurturing the skilled workforce to drive innovation and economic growth. By providing students with a strong foundation in these disciplines, STEM education equips individuals with the problem-solving, critical thinking, and technical skills essential for success in today's knowledge-based economy.

Key Benefits of STEM Education:

- Development of essential skills: STEM education cultivates various skills, including analytical thinking, problem-solving, creativity, and collaboration, which employers highly value.
- Innovation and entrepreneurship: A strong STEM education gives students the tools and knowledge to develop innovative solutions and become successful entrepreneurs.
- Economic growth: STEM graduates are often employed in high-paying jobs, contributing to economic growth and development.
- Global competitiveness: A strong STEM workforce is essential for maintaining a competitive edge in the global economy, as technological advancements drive rapid change across industries.
- Addressing societal challenges: STEM professionals are often at the forefront of addressing complex societal challenges, such as climate change, healthcare, and energy security.

Strategies for Promoting STEM Education:

- Early exposure: Introduce STEM concepts and activities early to spark interest and curiosity.
- Quality teaching: Ensure that STEM teachers are well-qualified, experienced, and equipped with the necessary resources to deliver effective instruction.

[4] As analyzed in the Case Studies Report, the United States, Singapore, and New Zealand have consolidated STEM education. The less developed economies of APEC (Chile; Korea; Peru and; Thailand) have recognized it as a weakness that requires immediate attention.

- Hands-on learning: Provide students with hands-on learning and experimentation opportunities to develop practical skills.
- Mentorship and role models: Connect students with STEM professionals who can serve as mentors and role models.
- Partnerships with industry: Collaborate with industry partners to provide students with real-world experiences and exposure to current trends.
- Inclusive and equal access: Ensure all students have access to quality STEM education regardless of their background or socioeconomic status.

Sustained Investment in Research and Development[5]

Sustained investment in research and development (R&D) is a cornerstone of economic growth, technological advancement, and global competitiveness. Successful economies have demonstrated a long-term commitment to R&D, recognizing its importance in driving innovation and fostering a knowledge-based economy.

Key Benefits of R&D Investment:

- Technological Leadership: Investing in R&D enables economies to develop cutting-edge technologies that drive economic growth and improve quality of life.
- Enhanced Global Competitiveness: R&D investment can help economies compete more effectively globally by creating new products, services, and markets.
- Job Creation: Innovation and technological advancements often lead to the creation of new industries, businesses, and jobs, stimulating economic activity.
- Improved Quality of Life: R&D can contribute to addressing pressing global challenges such as climate change, healthcare, and poverty, improving the quality of life for people worldwide.

To effectively foster R&D, economies must implement policies that create a supportive and enabling environment for researchers, businesses, and universities. These policies should include:

- Stable Funding: Providing consistent and predictable funding for R&D projects is essential for fostering long-term innovation.
- Intellectual Property Protection: Strong intellectual property rights are necessary to incentivize innovation and protect the commercial interests of researchers and businesses.
- Tax Incentives: Tax breaks and other financial incentives can encourage R&D investment by both public and private sector entities.

[5] All global economies face the challenge of maintaining or increasing investment in R&D. It reached this conclusion after conducting the first report, and it was also a topic of discussion on the first day and in the wrap-up session of the workshop.

- Collaboration and Partnerships: Collaboration between research institutions, businesses, and government agencies can accelerate innovation and facilitate technology transfer.
- Education and Training: Investing in education and training programs can develop a skilled workforce supporting R&D activities.

Harmonizing Regulatory Frameworks[6]

The recommendation to harmonize regulatory frameworks across APEC economies is a critical step towards fostering innovation and facilitating technology transfer. By aligning regulations, APEC members can create a more cohesive and predictable environment that encourages investment and collaboration.

Key Benefits of Harmonization:

- Reduced Barriers to Innovation: Inconsistent regulations can hinder the development and commercialization of new technologies. Harmonization can streamline processes, reduce administrative burdens, and create a more level playing field for innovators.
- Enhanced Technology Transfer: Harmonized regulations can facilitate technology movement across borders, making it easier for researchers, businesses, and universities to collaborate and share knowledge.
- Increased Investment: A more predictable and supportive regulatory landscape can attract greater investment in research and development (R&D). Investors are more likely to allocate resources to regions with clear and consistent rules governing intellectual property, data privacy, and other relevant areas.
- Fostered Cross-Border Collaborations: Harmonized regulations can break down barriers to international cooperation, enabling researchers and businesses to work together more effectively on projects that transcend domestic borders.

Specific Areas for Harmonization:

- Intellectual Property Rights: Aligning patent, copyright, and trademark laws can protect innovators and encourage the development and commercialization of new technologies.
- Data Privacy: Harmonizing data privacy regulations can ensure the secure and ethical handling of personal information, fostering trust and facilitating cross-border data flows.
- Regulatory Approval Processes: Streamlining and standardizing regulatory approval processes can reduce time-to-market for new products and services.

[6] One of the main obstacles facing APEC economies is the harmonization of regulatory frameworks related to R&D, intellectual property rights over discoveries, and their subsequent commercialization. This issue was highlighted in the discussions on the first day and in the wrap-up session of the workshop and was also one of the main recommendations of the first report based on the seven case studies.

- Competition Policy: Harmonizing competition laws can prevent anti-competitive practices and promote fair competition, encouraging innovation and reducing new business entry barriers.

Investing in Strategic Areas[7]

Investing in strategic areas of STI represents a crucial decision to maximize the impact of resources and accelerate economic and social development by focusing efforts on sectors and technologies with high potential.

Key benefits of Investing in Strategic Areas:

- Resource optimization: Concentrating resources in strategic areas allows for a more efficient allocation, avoiding dispersion and ensuring that each investment generates a greater return.
- Greater impact: By aligning investments with member's needs and strengths, the social and economic impact is maximized, generating innovative solutions to the most pressing challenges and taking advantage of the economie's competitive advantages.
- Competitive advantage: Specialization in strategic areas allows the development of unique and differentiated capabilities, positioning the member as a leader in key sectors and attracting foreign investment.
- Acceleration of processes: Focus speeds up the transfer of knowledge and the commercialization of technologies, reducing development times and bringing innovative products and services to market more quickly.
- Synergies and collaboration: Concentrating efforts in strategic areas facilitates collaboration between key actors in the innovation ecosystem, such as universities, companies, and government, generating synergies and amplifying results.
- Human capital development: Investment in strategic areas demands the training of specialized talent, which drives the development of human capital and strengthens the productive fabric.
- Resilience: By diversifying the economy and developing strategic sectors, resilience to external shocks increases, and dependence on traditional sectors is reduced.

Additional aspects to consider:

- Identification of strategic areas: It is essential to have robust mechanisms to identify them, considering factors such as global trends, member's strengths, market needs, and political priorities.
- Impact evaluation: Establishing indicators and monitoring mechanisms to evaluate the impact of investments in STI and adjusting strategies based on the results obtained is necessary.

[7] Investment in strategic areas is directly linked to R&D investment and support for technology-based companies and startups. Each economy must define these strategic areas, taking into account its own characteristics and growth potential. This issue has been highlighted in the workshop discussions and the seven economies surveyed in the first report.

- Governance and coordination: Effective governance and coordination between the different actors involved are essential to ensure the coherence and effectiveness of STI policies.

Fostering International Partnerships[8]

Encouraging equitable international partnerships is critical for supporting emerging economies and driving global innovation. By fostering collaboration, APEC members can share knowledge, resources, and expertise, leading to the development of innovative solutions to shared challenges.

Key Benefits of International Partnerships:

- Shared Knowledge and Expertise: Collaboration allows economies to learn from each other's strengths and weaknesses, leading to more efficient and effective innovation.
- Increased Access to Resources: International partnerships can provide access to funding, infrastructure, and talent that may be limited domestically.
- Enhanced Global Competitiveness: By working together, APEC members can develop stronger global supply chains, reduce trade barriers, and create new markets for their products and services.
- Addressing Global Challenges: International collaboration is essential for addressing global challenges such as climate change, healthcare, and sustainable development.

Strategies for Fostering Equitable Partnerships:

- Joint Ventures: Creating joint ventures between companies from different APEC economies can facilitate technology transfer, market access, and shared risk.
- Cross-Border R&D Collaborations: Encouraging research and development collaborations between universities, research institutions, and businesses can lead to developing innovative technologies.
- International Funding Initiatives: Establishing international funding initiatives can provide financial support for collaborative projects and help to bridge the funding gap for emerging economies.
- Clear Legal Frameworks: Developing clear legal frameworks to protect intellectual property rights and ensure equitable resource distribution is essential for fostering trust and cooperation among partners.

[8] Without exception, all economies surveyed in the first report emphasized the importance of this topic when implementing best practices. Moreover, several speakers addressed this issue during the workshop, and it was widely discussed among participants. This underscores the significance of international collaborations in science, technology, and innovation.

Developing Innovation Ecosystems[9]

Innovation ecosystems are interconnected networks of organizations, institutions, and individuals that work together to create, develop, and commercialize new ideas. A well-developed innovation ecosystem provides the necessary infrastructure and support for startups and academic research to thrive.

Key Components of Innovation Ecosystems:

- Incubators: Incubators provide startups with access to office space, mentorship, funding, and other resources to help them grow and succeed.
- Science Parks: Science parks are physical locations that bring together research institutions, universities, and businesses to foster collaboration and innovation.
- Technology Transfer Offices: Technology transfer offices help universities and research institutions commercialize intellectual property by connecting them with businesses and investors.
- Venture Capital and Angel Investors: Access to venture capital and angel investors is essential for providing the funding that startups need to grow and scale.
- Government Support: Government policies and initiatives can create a supportive environment for innovation, such as tax incentives, research grants, and regulatory reforms.

Benefits of Developing Innovation Ecosystems:

- Job Creation: Innovation ecosystems can create jobs and stimulate economic growth.
- Enhanced Global Competitiveness: A strong innovation ecosystem can help a region or a single domestic economy become more competitive globally.
- Improved Quality of Life: Innovation can lead to developing new products and services that improve people's lives.
- Social and Economic Development: Innovation ecosystems can contribute to social and economic development by creating new opportunities for entrepreneurs and fostering a culture of innovation.

[9] Several speakers highlighted the development of innovation ecosystems, which were discussed in depth and emphasized in the workshop's wrap-up session. Additionally, all economies surveyed in the first report, albeit with varying degrees of emphasis due to different levels of local development, acknowledged the importance of these ecosystems for domestic economies in driving scientific and technological advancement.

Developing Innovation Culture[10]

It is a social, economic, and political environment that fosters the generation and application of new ideas, technologies, and products. It involves a series of public policies, investments in R&D, and a mindset open to societal change.

Benefits of a Member-Wide Innovation Culture

- Sustainable economic growth: Innovation is a key driver of long-term economic growth, generating new jobs and increasing productivity.
- Increased international competitiveness: Innovative economies are more competitive in the global market, attracting foreign investment and generating exports.
- Solving social problems: Innovation can help address social challenges such as poverty, inequality, and climate change.
- Improved quality of life: Innovation can lead to the creation of new products and services that improve the quality of life for citizens.

Strategies to Implement:

- Investment in R&D: Allocating sufficient resources to fund basic and applied research in universities, research centers, and companies.
- Education and training: Promoting STEM education (science, technology, engineering, and mathematics) and fostering continuous learning to develop the skills needed for innovation.
- Entrepreneurship: Creating a favorable ecosystem for entrepreneurship, facilitating access to financing, mentorship, and networks.
- Intellectual property protection: Establishing a robust system to incentivize innovation and investment.
- Public-private collaboration: Fostering collaboration between the public and private sectors to accelerate technology transfer and the commercialization of new products.
- Flexible regulatory framework: Implementing a regulatory framework that is flexible and adaptable to technological changes, avoiding bureaucratic obstacles that inhibit innovation.
- Risk culture: Fostering a culture that values risk and experimentation, recognizing that failure is inevitable in the innovation process.
- Dissemination of entrepreneurial culture: Through educational and scientific outreach programs, promoting an entrepreneurial culture from an early age.

[10] This topic is primarily drawn from the more developed economies surveyed for the first report, such as the USA and New Zealand. It highlights how these economies cultivate and foster a culture of innovation among their populations, promoting entrepreneurship through a series of supportive instruments.

- Measurement and evaluation: Establish indicators to measure progress towards an innovation culture and evaluate the impact of implemented policies.

World Class Universities[11]

World-class universities in STI are crucial in generating knowledge, training highly specialized talent, and promoting innovation. These institutions are distinguished by their academic excellence, ability to attract and retain top researchers, and strong ties to the productive sector.

Benefits of World-Class Universities in STI:

- Knowledge generation: They conduct cutting-edge research, contributing to advancing knowledge in various disciplines.
- Talent development: They offer high-quality study programs that prepare students to meet the challenges of the 21st century.
- Fostering innovation: They promote the creation of knowledge-based companies and facilitate technology transfer to the productive sector.
- Attracting investment: They attract foreign direct investment, both for research and the creation of knowledge-based companies.
- Economic development: They contribute to the economic development of their regions and economies, generating high-quality jobs and promoting economic diversification.
- Improving quality of life: They develop innovative solutions to social challenges, such as health, energy, and the environment.

Characteristics of World-Class Universities in STI

- Academic excellence: They demonstrate high-quality standards in teaching and research.
- Frontier research: They conduct cutting-edge research in strategic areas.
- High-quality faculty: They have a highly qualified and internationally recognized faculty.
- International collaboration: They partner with other universities and research centers worldwide.
- Links with the productive sector: They collaborate closely with companies to develop applied research projects and promote technology transfer.
- Entrepreneurship: They promote entrepreneurship and the creation of knowledge-based companies.
- State-of-the-art infrastructure: They have state-of-the-art research facilities and equipment.

[11] This recommendation emerges as a conclusion from various topics such, as the promotion of STEM education, the high-level training of human resources with specific skills and abilities, and the attraction and retention of talent, which can only be achieved by establishing world-class universities. Moreover, the need to improve the quality of education is a recurring theme in most of the economies surveyed in the first report.

7. Innovation Roadmap: Short, Medium, and Long-Term Recommendations

This document provides key recommendations to establish, scale, and sustain innovation initiatives, focusing on immediate actions, optimization strategies, and long-term goals. It aims to guide organizations and policymakers in building a strong innovation ecosystem that drives growth and aligns with domestic priorities.

Short Term (0-2 years):

- Diagnosis and Evaluation: Conduct a thorough diagnosis of the existing STI ecosystem, identifying strengths, weaknesses, and opportunities. Evaluate current public policies and their impact on innovation.
- Creation of an Innovation Fund: Establish an innovation fund to support early-stage research and development projects.
- Networks of Mentors and Advisors: Form networks of specialized mentors and advisors to support entrepreneurs and innovative companies.
- Accelerated Training Programs: Implement intensive training programs to rapidly train professionals in critical areas of R&D+i (Research, Development, and Innovation) and Technology Transfer (TT).
- Foster collaboration among institutions: Establish collaboration networks among universities, research centers, and companies, facilitating the exchange of knowledge and resources.
- Training and talent development: Implement training and updating programs for professionals in science, technology, and innovation (STI).
- Creation of incubators and accelerators: Establish physical and virtual spaces to support the growth of startups and knowledge-based companies.

Medium Term (2-5 years):

- Investment in basic research: Increase investment in basic research to generate new knowledge and lay the foundation for future innovations.
- Strengthening intellectual property: Develop policies and mechanisms to protect intellectual property and promote technology transfer.
- Promotion of an entrepreneurial culture: Foster an entrepreneurial culture in society, encouraging the creation of new technology-based companies.
- Establishment of Innovation Clusters: Promote the creation of thematic clusters to concentrate the supply and demand of knowledge and technology in strategic areas.
- Promotion of Innovative Public Procurement: Implement mechanisms for the public sector to acquire innovative products and services, stimulating demand and the development of new solutions.
- Tax Incentives for R&D: Expand tax incentives for companies investing in research and development, fostering private investment in innovation.

- Strengthening University-Industry Links: Promote collaboration between universities and companies through joint projects, technology transfer, and the creation of spin-offs.

Long Term (5 years and beyond):

- Development of a Domestic Innovation Strategy: Develop a long-term domestic innovation strategy with clear objectives, performance indicators, and monitoring and evaluation mechanisms.
- Development of innovation ecosystems: Build regional and domestic innovation ecosystems, integrating all relevant actors in the STI system.
- Adaptation to global trends: Monitor global trends in STI and adopt domestic policies and strategies accordingly.
- Promotion of an Innovation Culture: Implement educational and science outreach programs to foster a culture of innovation in society.
- Internationalization: Participate in international innovation networks and promote collaboration with other economies in research and development projects.

Additional Considerations:

- Flexibility: It is important to consider that timelines may vary depending on each economy or region's specific context.
- Evaluation and adjustment: The implementation of these recommendations should be evaluated periodically to identify progress, challenges, and areas that require adjustments.
- Synergies: It is essential to seek synergies among the different recommendations and coordinate the actions of the various actors involved.
- Participation of All Actors: Involve all relevant actors in the STI ecosystem (government, academia, businesses, civil society) in the definition and implementation of strategies.
- Sustainable Financing: Ensure a sustainable source of financing for long-term innovation activities.
- Impact Evaluation: Implement systems to evaluate the impact of innovation policies and programs, measure their effectiveness, and adjust as needed.
- Communication and Dissemination: Effectively communicate the results of innovation initiatives to generate greater visibility and attract new actors.
- Incentives for universities and businesses: Tailored incentives can encourage universities to engage in research and technology transfer activities, while incentives for businesses can promote innovation and commercialization. These incentives may include tax breaks, research grants, and access to funding.
- Reduced bureaucracy: Streamlining administrative processes and reducing bureaucratic burdens can facilitate innovation and entrepreneurship. This may involve simplifying regulations, reducing paperwork, and providing one-stop shops for businesses.
- Strong patent system: A robust patent system is essential to protect intellectual property and incentivize innovation. It gives inventors exclusive rights to their creations, encouraging them to invest in research and development.

- The Relativity of Innovation Strategies: It is common for innovation policies, programs, or models that have been successful in one economie not to yield the same results in another. This is due to a series of factors that make each member unique and particular: socioeconomic context, institutional framework, human capital, infrastructure, and entrepreneurial culture.

8. Conclusions

This report includes the recommendations generated throughout the project, which involved conducting a preliminary report based on case studies of seven selected APEC economies. An in-depth analysis of each economy's S&T policies and programs was initially conducted, followed by a comparative analysis to extract the first set of recommendations. These recommendations were then used as input for the Workshop activities and discussions, which, together with speaker presentations and expert case studies, enriched the participants' exchanges of views and led to their own conclusions and a comprehensive list of recommendations that expanded upon the initial ones.

This comprehensive report also provides a detailed overview of the APEC Workshop held in Lima, Peru, on 14-15 August. It delves into the workshop's key objectives, the methodologies employed, the valuable insights shared by expert presenters, and the significant findings that emerged from the discussions. Additionally, the report offers a comprehensive set of recommendations tailored to APEC economies' specific needs and challenges.

The recommendations outlined in this report provide a comprehensive framework for fostering innovation and promoting the effective transfer of technology within the APEC region. They address some critical areas essential for driving economic growth, enhancing global competitiveness, and improving the quality of life for citizens.

One key theme emerging from these recommendations is the importance of building strong innovation ecosystems. By fostering collaboration between academia, industry, and government, APEC economies can create environments conducive to the development and commercialization of new technologies. This includes investing in research and development, supporting startups, and creating favorable regulatory frameworks.

Another critical area highlighted in the recommendations is the need for talent development. A skilled workforce is not just a resource, but a driving force behind innovation and sustained economic growth. By investing in education and training programs that align with industry needs, APEC economies can ensure that they have the talent necessary to compete on the global stage.

Furthermore, the recommendations underscore the role of international collaboration in fostering innovation and technology transfer. By working together, APEC economies can leverage shared knowledge, resources, and expertise, leading to the development of more innovative and effective solutions to shared challenges. Cross-border partnerships can also help bridge the development gap between developed and developing economies.

In conclusion, the recommendations presented in this report provide a roadmap for APEC economies to foster innovation, enhance competitiveness, and improve the quality of life for their citizens. By implementing these recommendations, APEC can position itself as a global leader in technology and innovation, driving economic growth and prosperity for all.

9. Annexes

Annex I: Agenda

APEC PERU 2024

ENHANCING TECHNOLOGY AND INNOVATION MANAGEMENT PRACTICES IN APEC ECONOMIES

EVENT DATE
[14 -15 August 2024]

AGENDA
DAY 1

* All dates and timings are for GMT-5 time zone

TIME	CONTENTS
09:00-09:20	**Registration**
09:20-09:25 Dr. Sixto Sanchez Calderon	Welcome speech President of CONCYTEC of Peru
9:25-9:45 David Lujan	Project Introduction and agenda Project Overseer (PO)
9:45-10:30	**Speaker 1:** Innovating in Technology and Innovation Management (TIM) Practices in APEC Economies
Alvaro Ossa (Chile)	Presentation of the results obtained during the research phase on the best practices of R&D management, as well as the main findings of conducted case studies and conclusions and recommendations as input for discussion panels.
10:30 - 10:40	**APEC official photo**
10:40 - 11:00	Morning **Coffee break**
11:00 - 12:30	**Forum:** Strengthen the link between Academia and Industry for TIM: How to begin?
Álvaro Ossa (Chile) Luthfina Ariyani (Indonesia) Verónica Montoya (Perú) David Bridges (USA)	The speakers who are government official representatives, technology and innovation experts at universities, R&D institutes will share experiences on successful technology and innovation management. They will analyze new strategies to promote academia-industry technology transfer.
12:30 - 14:30	**Lunch time**

VENUE
[Lima Convention Center, located in the city of Lima, Peru]
Detailed Address: [Av. de la Arqueología 174, San Borja, Lima - Peru
Room Armatambo y Maranga - 4th floor
https://www.idom.com/en/project/lima-convention-centre/

APEC PERU 2024

ENHANCING TECHNOLOGY AND INNOVATION MANAGEMENT PRACTICES IN APEC ECONOMIES

EVENT DATE
[14 -15 August 2024]

AGENDA
DAY 1

* All dates and timings are for GMT-5 time zone

TIME	CONTENTS
14:30 - 16:30	**Roundtable Discussion** – Interactive Session I
Fairul Azida Shahabudin (Malaysia) Milagros Zavaleta (Peru) Pavel Corillocila (Peru)	**Topic 1: Science and Technology Policy STP for TIM: Barriers and challenges experiences from APEC Economies** The speakers who are government official representatives, technology and innovation experts at universities/institutes, technology transfer/commercialization managers, or/and industry representatives will present cases on Technology and Innovation Management and STP in the APEC region.
16:00 - 16:15	Pause - **Coffee break**
16:30 - 16:45 Alfonso Accinelli (Perú)	**Conclusion Day 1**

VENUE
[Lima Convention Center, located in the city of Lima, Peru]
Detailed Address: [Av. de la Arqueología 174, San Borja, Lima - Peru
Room Armatambo y Maranga - 4th floor
https://www.idom.com/en/project/lima-convention-centre/

APEC PERU 2024

ENHANCING TECHNOLOGY AND INNOVATION MANAGEMENT PRACTICES IN APEC ECONOMIES

EVENT DATE
[14 -15 August 2024]

AGENDA
DAY 2

* All dates and timings are for GMT-5 time zone

TIME	CONTENTS
09:00-09:30	**Registration**
9:30-10:30 David Bridges (USA)	**Speaker 2: Science and Technology Policy framework to foster technology transfer between Academia-Industry** The expert will present the conditions related to instruments or public policies aimed at creating the appropriate conditions for technology transfer between academia and industry with a view to its commercialization. They will also present applied examples in APEC economies and their lessons learned. This as input for the second interactive activity.
10:30 - 11:00	Morning **Coffee break**
11:00 -12:00 Halila Faiza (Malaysia)	**Speaker 3: What's next in Technology Transfer Strategies to enhance the Domestic Innovation System?** The expert will present the conditions related to instruments or STPs aimed at creating the appropriate conditions for technology transfer between academia and industry with a view to its commercialization. They will also present applied examples in APEC economies and their lessons learned. This will serve as input for the second interactive activity.
12:00-12:30 Pavel Corillocila (Peru)	**Speaker 4:** Large scale international partnerships and their role in TT in emerging economies
12:30 - 14:30	**Lunch time**

VENUE
[Lima Convention Center, located in the city of Lima, Peru]
Detailed Address: [Av. de la Arqueología 174, San Borja, Lima - Peru
Room Armatambo y Maranga - 4th floor
https://www.idom.com/en/project/lima-convention-centre/

APEC PERU 2024

ENHANCING TECHNOLOGY AND INNOVATION MANAGEMENT PRACTICES IN APEC ECONOMIES

EVENT DATE
[14 -15 August 2024]

AGENDA
DAY 2

* All dates and timings are for GMT-5 time zone

TIME	CONTENTS
14:30 - 16:30	**Roundtable Discussion** – Interactive Session II
Ivan Ermokhin (Russia) Eduardo Fuentes (Perú) Fairul Azida Shahabudin (Malaysia)	**Topic 2 : Experience from APEC Economies on promoting TIM and science and technology framework policies** Speakers who are government official representatives, technology and innovation experts at universities/institutes, technology transfer/commercialization managers, or/and industry representatives to present representative cases or experience on Technology and Innovation Management and STP in APEC region, especially give feedback.
16:00 - 16:30	Pause - **Coffee break**
16:30 - 16:45	**Wrap-up session for day 2** **Conclusion**

VENUE
[Lima Convention Center, located in the city of Lima, Peru]
Detailed Address: [Av. de la Arqueología 174, San Borja, Lima - Peru
Room Armatambo y Maranga - 4th floor
https://www.idom.com/en/project/lima-convention-centre/

Annex II: Speakers and Organization Team

Speakers

Chile

Alvaro Javier Ossa Daruich – Director of Technological Transfer at Pontifical Catholic University of Chile

Indonesia

Luthfina Ariyani- National Research and Innovation Agency (BRIN)

Malaysia

Fairul Azida Shahabudin- Ministry of Science, Technology and Innovation

Halila Faiza Zainalabidin- Ministry of Science, Technology and Innovation

Peru

Pavel Corilloclla Terbullino – COINCIDE

Eduardo Fuentes- Red Universitaria de Innovación

Verónica Montoya Blua- PUCP

Milagros Zavaleta- BTS Consulting

Russia

Ivan Ermokhin- Academy of the Ministry of Economic Development of Russia

United States

Davis Bridges- Vice President of Enterprise Innovation Institute- Georgia Institute of Technology

Organization Team

Chile

Alvaro Javier Ossa Daruich – Project Consultant- Director of Technological Transfer at Pontifical Catholic University of Chile

Peru

David Luján- P.O. Organization Team- Concytec

Alfonso Accinelli- O.T.- Concytec

Zenia Medina- O.T.- Concytec

Solange Ruiz- O.T.- Concytec

Annex III: List of participants

Chile

Luis Nilo- Chief of IP at Universidad Adolfo Ibañez

China

Francie Hsueh- Chung Hua Institution for Economic Research (CIER)

Indonesia

Andi Risdawati Alwi Paluseri- National Research and Innovation Agency (BRIN)

Perú

Joe Lucero Chuquista- Universidad Peruana Cayetano Heredia

María del Carmen Águila- National Institute of Health of Perú- INS

Luz Genara Castañeda Pérez- Universidad Nacional Federico Villareal

Francisco Cuellar- PUCP

Gianmarco Guerrero- Ministerio de Economía y Finanzas

Irina Salazar Churata- Regional Goverment of Arequipa

Reynaldo Raygada- Universidad de Piura

Nerida Pastrana- Hermilio Valdizan National University of Huánuco

Carlos Gamarra- Universidad Nacional Mayor de San Marcos

Carlos Ticla- Centro de Innovación Productiva y Transferencia Tecnológica del Cuero

Margarita Mondragón- National University of Engineering

Mario Quinde- Universidad de Piura

Karina Maldonado- Concytec

Ximena Romero- Concytec

Julián Alberto- Talma

Rosa Rucano- ProCiencia

Manuel Catacora- Concytec

Russia

Daria Nozhenko- Ministry of Economic Development of Russia

Thailand

Kommate Jitvanichphaibool- Deputy Director APEC Center for Technology Foresight (APEC CTF), Office of National Higher Education, Science, Research and Innovation Policy Council (NXPO)

Asira Chirawithayaboom- Senior Policy Specialist APEC Center for Technology Foresight (APEC CTF), Office of National Higher Education, Science, Research and Innovation Policy Council (NXPO)

Annex IV: Survey[12]

APEC Project Evaluation Survey - Workshop

APEC Project Name/Number: (PPSTI_202_2023A) – "Enhancing Technology and Innovation Management Practices in APEC Economies: a focus on public policies and Programs to promote academia-industry technology transfer"

Date: 14 - 15 August 2024.

Thank you for participating in the PPSTI_202_2023A Workshop "Enhancing Technology and Innovation Management Practices in APEC Economies" on August 14-15 in Peru. We would now like to collect your feedback on how well the event was organized and how it contributed to your capacity building. We value your input and this survey will take about 10 minutes to complete.

Thank you very much.

Please indicate your level of agreement with the statements listed in the table below *

	Strongly Agree	Agree	Disagree
The objectives of the workshop were clearly defined	○	○	○
The project achieved its intended objectives	○	○	○
The agenda items and topics covered were relevant	○	○	○
The content was well organized and easy to follow	○	○	○
Gender participation was sufficient during the event	○	○	○
The trainers/experts or facilitators were well prepared and knowledgeable about the topic	○	○	○
The interactive session were useful	○	○	○
The time allotted for the training was sufficient.	○	○	○

[12] Source: APEC Technology Innovation Management Workshop: Final Report. 14-15 August 2024. Lima, Perú. Reported by Joe Lucero. Project Overseed's: David Luján.

1. How relevant was this project to you and your economy? *

	1	2	3	4	5	
Not much	○	○	○	○	○	Very

Explain the option selected *

Tu respuesta

2. In your view, what were the events results/achievements? *

Tu respuesta

3. What new knowledge did you gain from this event? *

Tu respuesta

4. Rate your level of knowledge of the topic prior to participating in the event: *

	1	2	3	4	
Very low	○	○	○	○	Very high

5. Rate your level of knowledge of the topic after participating in the event: *

	1	2	3	4	5	
Very low	○	○	○	○	○	Very high

Explain the option selected *

Tu respuesta

6. How will you apply the event's content and knowledge gained at your workplace? Please provide examples (e.g. develop new policy initiatives, organize training, develop work plans/strategies, draft regulations, develop new procedures/tools etc.). *

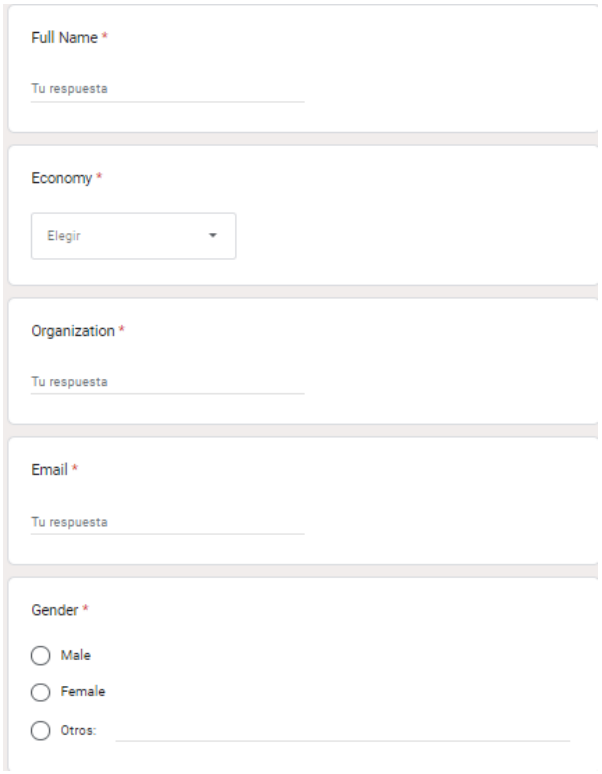
Tu respuesta

7. How effective do you believe the project was in highlighting best practices from other APEC economies that can be implemented in your own economy to enhance technology transfer and innovation management? *

	1	2	3	4	5	
Not effective	○	○	○	○	○	Very effective

Explain the option selected *

Tu respuesta



Result of Survey

Participants were surveyed on the effectiveness of the workshop. The majority expressed satisfaction with the event's structure, content, and the diversity of perspectives shared. Key feedback included a request for more hands-on sessions and case studies in future workshops.

The survey aimed to gather feedback from participants on various aspects of the workshop, including the clarity of objectives, relevance of content, and the effectiveness of the facilitators. The results, along with participant comments, indicate a high level of satisfaction among the attendees.

A. Workshop Objectives

The clarity of the workshop objectives was well received by participants. Out of all respondents, 88% (22 participants) strongly agreed that the objectives were clearly defined, while the remaining 12% (3 participants) agreed. Participants noted that the objectives were "very clear," with one remarking that the objectives "aligned well with the overall goals of the project."

B. Achievement of Project Objectives

Participants provided positive feedback on the workshop's success in achieving its intended objectives. 88% strongly agreed, and 12% agreed that the project met its goals. A participant highlighted the practical value of the workshop, stating, "The workshop provided very good

case studies from economies," which was echoed by others who appreciated the diversity and applicability of the examples presented.

C. Relevance of Agenda Items

The relevance of the agenda items and topics covered was universally praised. All 26 participants (100%) strongly agreed that the topics were pertinent. Comments such as "many ideas and initiatives were shared" and "the topics were very relevant to current challenges" suggest that the workshop effectively addressed key issues of interest to the participants.

D. Organization and Clarity of Content

The organization and clarity of the workshop content were also highly rated. 92% of participants strongly agreed that the content was well-organized and easy to follow, while 8% agreed. One participant specifically mentioned, "The content was easy to follow and well-organized," which reflects the overall positive sentiment regarding the structure of the workshop.

E. Gender Equal Participation

Participants generally felt that gender equal participation during the event was sufficient, with 92% strongly agreeing and 8% agreeing. This feedback suggests that the workshop was perceived as inclusive, though no specific comments on gender equality were provided.

F. Facilitators' Preparedness

The facilitators were universally praised for their preparedness and knowledge, with all participants strongly agreeing. One participant commented, "The facilitators were very knowledgeable and well-prepared," highlighting the high level of expertise that was evident throughout the workshop.

G. Usefulness of Interactive Sessions

The interactive sessions were seen as particularly valuable, with all participants strongly agreeing on their usefulness. One participant remarked, "It's a very good event. Open opportunity for knowledge sharing and collaboration" indicating that these sessions significantly enhanced the learning experience.

H. Time Allocation

The time allocated for the training received slightly more varied feedback. While 64% of participants strongly agreed that the time was sufficient, 36% agreed. Some participants suggested that additional time could have been beneficial, particularly for in-depth discussions. Comments have this idea, "The time was generally sufficient, but more time for interaction would be ideal."

Conclusion of the survey:

The feedback from the workshop participants was overwhelmingly positive, with particular strengths identified in the relevance of the content, the expertise of the facilitators, and the effectiveness of the interactive sessions. The comments provided by participants emphasized the practical value, strong organization, and relevance of the workshop content. While the time allocation was generally well-received, there is an indication that more time could have enhanced the interactive components further. Overall, the workshop was well-managed and successfully met the expectations of its participants, as reflected in both the quantitative data and the qualitative feedback.

Annex V: Study cases

	NAME THE ECONOMY: MEXICO	
1.	**Economic context.** Describe the economic context.	Max. ½ page
Mexico is one of the fifteen largest economies in the world and second in Latin America; its population is almost 130 million. It has strong macroeconomic institutions, is open to trade, and has diversified manufacturing connected to global value chains. The economy had growth estimated at just over 2.0% annually between 1980 and 2022, limiting progress in convergence relative to high-income economies. The economy grew 3.2% in 2023 and the official poverty rate fell from 43.9% in 2020 to 36.3% in 2022. Mexico's stable macroeconomic framework, the dynamism of the United States and the solid manufacturing base support economic growth, but to accelerate For sustainable economic growth and poverty reduction in the medium term, Mexico must address structural limitations, such as limited access to finance, insecurity, informality, regulatory burdens and infrastructure bottlenecks. According to ECLAC, it forecasts it will grow 2.7% in 2024. The World Bank has supported the expansion of financial access for poor and rural populations, women, youth and MSMEs. Through an established network of private financial intermediaries. Rural MSMEs benefited from better access to financing and greater economic activity. The financing helped intermediaries reach more clients and grow their activities in rural areas with low levels of non-performing loans, it also served to promote inclusion, job creation and to support the supply of rural financing from the private sector. at the same time that they made them self-sufficient over time. This experience can now be passed on to other economies where rural finance is limited and has proven difficult to scale up.		
2.	**Main R&D and technology transfer policies.** Summarize the primary R&D and technology transfer policies, focusing on their objectives, key initiatives, sector where the technology transfer case occurred, and institutional roles.	Max. ½ page
On 8 May 2023, the General Congress of Mexico decrees the general law on humanities, sciences, technologies and innovation, and various provisions of the federal law on parastatal entities and the planning law are reformed and added. According to the Mexico Innovation Program, based on the Mexico Strategic Programs, it includes diagnoses and perspectives on technological development and innovation, as well as areas and lines of action. The transfer of technologies essential for development is encouraged and will promote cutting-edge strategic technologies, to consolidate the scientific and technological independence of the member (articles 48 to 52) and includes the generation and transfer of technology, the provision of scientific, technological and specialized innovation programs and capacity development in the public service (article 79). The Constitution (cpeum) also refers to knowledge, science and technology in articles 2 and 3 in matters related to: vii) the transfer of technology for domestic development: (1) support scientific, humanistic and technological research and innovation ;(2) guarantee open access to information derived from scientific, humanistic and technological research and innovations with support from the public administration; (3) promote technology transfer. It is worth mentioning that public budget cuts for science and technology have led to disputes over support within the communities.		

3.	**Status of R&D and technology transfer.** Provides an overview of current R&D and technology transfer activities and their effectiveness in bringing innovations to market.	Max. ½ page

In 2016, companies invested only 19% in R&D, in 2017 surveys only 8.4% of companies carried out innovation projects in collaboration with Public Research Centers. Between 2001-2018, the investment of the federal entities in research funds was insufficient and inequitable. A total of MXN14,236 million were invested in funds for Research in this period, 57.8% of the resources were contributed by Conacyt and the public administration only with the remaining 42.2%, but unequally between entities, with special concentration in 3 entities. Mexico has a serious problem of low levels of investment in R&D, far below its legal mandate and the level of investment necessary for STI to become a lever for development. There has been an increasing domestic dependence on the development of new scientific knowledge and technology abroad.

Between 2021-2024 they have been based on measures that imply a great leap forward not only in terms of statistical value but in terms of their value to define public policies in STI for the general well-being of the population, for example: (a) Spending on Scientific Research and Experimental Development (GIDE) as a percentage of the Gross Domestic Product that shows the investment in research and technological development aimed at improving the well-being of the population at the domestic level.

(b) Investment in frontier science as a percentage of the GIDE that measures the investment in the generation of frontier knowledge carried out by the business sector, government, higher education institutions and private non-profit institutions as a proportion of total expenditure on research and experimental development.

4.	**Case of public policies in technology transfer and innovation management.** Describe a technology transfer public policy implemented and the sector where the technology transfer case occurred.	Max. ½ page

Strategies to articulate collaboration between the different levels of government and the STI sector, as well as mechanisms that provide coherence and interoperability of the information and capacities of the different institutions, to optimize and enhance the use of data and substantive information and guarantee the implementation of scientifically based public policies. You have:

a. Priority strategy: Design public policies in STI, differentiated according to the realities of each economy and region, that reduce the inequality gaps that exist in the member's scientific community.

b. Promote scientific, technical, humanistic and socioeconomic research projects in biosafety, which contribute to decision-making, the design of public policies and that their results are disseminated in an accessible manner among the public and social sectors.

c. Promote commitment, collaboration, participation and contribution to the development of comprehensive biosafety public policies among the CTI community.

5.	**Case of technology transfer and innovation management program.** Describe a technology transfer program implemented and the sector where the technology transfer case occurred.	Max. ½ page

The Special Program of Science, Technology and Innovation 2021-2024 is based on domestic and international goals and parameters that help measure compliance with the priority objectives in the matter. They are the foundations of the new public policy framework on Science, Technology and Innovation in Mexico, with a transversal, intersectoral approach, and safeguards for the domestic sovereignty of the territory and the multiculturalism of the economie. The new science for Mexico combats forms of exclusion and discrimination against marginalized populations, with a gender equality perspective and inclusion of indigenous and rural populations; considers public and citizen participation; the protection of the universal rights of peoples and the protection of the environment as its main driving force. Below, measures are proposed that imply a great leap forward not only in terms of statistical value but in terms of their value to define public policies in STI for the general well-being of the population. The quantitative foundation of the Program is based on domestic and international goals and parameters that help measure compliance with the priority objectives in the matter. Although the design of quantitative statistical instruments does not fully represent the complexity of the new paradigm launched for the STI sector, the goals for well-being provide a reliable tool that indicates the good progress of science in Mexico and By 2024, it will have strong public science that guarantees the general well-being of the population and the environment. This APEC member and long-term policy of the STI sector is essential for the application of public science focused on the solution of priority domestic problems, so that in 2040 scientific sovereignty is achieved with emphasis on solving problems around to health, food, exclusion, environment, inequality, human rights and violence.

6.	**Conclusions and recommendations.** Summarize the conclusion and provide recommendations to improve the technology transfer ecosystem in the Economy.	Max. ½ page

This new government begins on 30 September 2024 with the General Law on HCTI as a result of a collective process of construction and validation by CONACYT in four years, involving almost 70 thousand people, organizations and institutions from the public and private sectors. and social, as well as the academic and university sphere. Scientific sovereignty is highlighted to solve priority domestic problems, this is a form of self-determination of research that includes an always complex unity of the interests of researchers and the needs of the territory. R&D and Technology Transfer will be promoted; It is clear that they have already standardized their indicators to see the evolution in CTI. Its innovation system has 5 focuses including the environment and the well-being of society. Latin America is characterized by an economy with high MSMEs with difficulties in accessing financing, but Mexico, through the World Bank, is supporting rural areas, including. It is recommended that the CTI support this segment so that they are integrated into the global value chain of this economie and encourage the private sector to invest in R&D and Technology Transfer.

Presented by Carlos Tilca

	NAME THE ECONOMY: Thailand	
1.	**Economic context.** Describe the economic context.	Max. ½ page

Thailand is the second-largest economy in Southeast Asia after Indonesia, with an upper-middle income status.

Economic Structure

- **Agriculture:** Agriculture still plays a significant role, particularly in rural areas. Thailand is one of the world's largest exporters of rice, rubber, and seafood.
- **Industry:** The industrial sector, particularly manufacturing, is a crucial driver of the Thai economy. Thailand is a hub for automobile production, electronics, and appliances, making it a key part of global supply chains.
- **Services:** The service sector, including tourism, finance, and retail, is increasingly significant. Tourism, in particular, is a major source of income, attracting millions of visitors annually.

Trade and Investment

- **Exports:** Thailand is highly dependent on exports, with major exports including automobiles, electronics, and agricultural products. The economy has trade agreements with various members, making it an integral part of regional and global trade networks.
- **Foreign Direct Investment (FDI):** Thailand attracts significant FDI, particularly in the manufacturing and services sectors. The government promotes investment through incentives and has established several special economic zones.

2.	**Main R&D and technology transfer policies.** Summarize the primary R&D and technology transfer policies, focusing on their objectives, key initiatives, sector where the technology transfer case occurred, and institutional roles.	Max. ½ page

Technology Licensing and Transfer Framework

- **Legal Framework:** Thailand has established legal frameworks to facilitate technology transfer, including intellectual property laws that protect patents, trademarks, and copyrights. These laws are designed to encourage foreign and domestic firms to engage in technology transfer activities.
- **Technology Licensing Office (TLO):** Universities and research institutions often have a dedicated TLO that manages the commercialization of research outputs. These offices help in patenting innovations and licensing them to industry partners.

Thailand Research and Innovation Utilization Promotion Act (TRIUP Act, 2022)

Its primary goal is to ensure that results from APEC member-funded research and innovation are effectively used to benefit various sectors, and the society.

- **Ownership of Research Outputs**: The Act allows recipients of this APEC member research funding, such as universities, research institutions, or private sector entities, to own the research and innovation outputs.
- **Revenue Allocation**: The Act ensures fair revenue sharing with researchers, providing them with incentives to produce impactful research that addresses technological, industrial, and societal issues.

Simplified Processes: The Act reduces the complexity and time required for negotiations and approvals, particularly concerning the transfer of ownership rights to the private sector, thereby encouraging faster commercialization and practical application of research results.

3.	**Status of R&D and technology transfer.** Provides an overview of current R&D and technology transfer activities and their effectiveness in bringing innovations to market.	Max. ½ page

The current status of research commercialization in Thailand shows progress but also highlights challenges that need to be addressed. In recent years, there has been a concerted effort by the government and academic institutions to enhance the commercialization of research, aligning with the Bio-Circular-Green (BCG) economic model. This model emphasizes innovation-driven industries and seeks to transition the member toward innovation-driven and sustainable economy.

Over the years, the pace of research commercialization has been increasing, supported by initiatives such as the establishment of TTOs in universities and research institutions and the endorsement of TRIUP Act. Over 80 universities and research institutes have established TTOs to facilitate technology transfer activities. Moreover, there has been a growing number of startup companies and spin-offs emerging from university research, contributing to the commercialization landscape.

Despite these advancements, challenges remain, particularly in scaling these efforts and ensuring that research outputs are effectively commercialized on a broader scale. There is also a need for stronger industry-academia collaborations and improved infrastructure to support the commercialization process.

4.	**Case of public policies in technology transfer and innovation management.** Describe a technology transfer public policy implemented and the sector where the technology transfer case occurred.	Max. ½ page

Baiya Phytopharm, a Thai biopharmaceutical company, was co-founded by professors from Chulalongkorn University, with the goal of producing biopharmaceutical products such as vaccines and therapeutic proteins using their proprietary BaiyaPharming™ technology.

Key Points on Research Commercialization:

- **COVID-19 Vaccine Development**: Baiya Phytopharm developed a plant-based COVID-19 vaccine using a specific species of tobacco plant. The company rapidly moved from prototype to clinical trials, with their vaccine being the first plant-derived COVID-19 vaccine to enter human clinical trials in Asia. The company received financial support from the government for research and infrastructure development.
- **Facility and Production**: To support the commercialization of their research, Baiya Phytopharm established a Good Manufacturing Practice (GMP) certified facility in Bangkok. This facility enables the production of a wide range of biopharmaceuticals, including COVID-19 vaccines, and can scale up to meet regional demands.
- **Broader Applications**: Beyond COVID-19, Baiya Phytopharm is working on other critical therapeutics, including anti-cancer drugs, anti-rabies antibodies, and anti-venom, all produced using their plant-based technology. The company's research addresses unmet medical needs in Thailand and Southeast Asia, aiming to provide effective and affordable treatments for diseases that are prevalent in the region

5.	**Case of technology transfer and innovation management program.** Describe a technology transfer program implemented and the sector where the technology transfer case occurred.	Max. ½ page

The Innovation Technology Assistance Program (iTAP) is a key initiative under Thailand's National Science and Technology Development Agency (NSTDA) aimed at supporting Small and Medium Enterprises (SMEs) in adopting and integrating new technologies into their operations. The primary goal of iTAP is to help SMEs overcome technological challenges by providing technical consultancy, project management, and financial support. The program is designed to bridge the gap between research and industry, enabling businesses to innovate and improve their competitiveness. iTAP provides services as follows.

- Technical Consultancy: iTAP offers expert consultancy to SMEs, helping them analyze technical problems and develop solutions tailored to their specific needs.
- Financial Support: The program provides financial assistance, covering up to 50% of the project budget.
- Project Management: iTAP supports SMEs in managing and assessing their technology development projects, ensuring effective implementation and monitoring.

Overall, iTAP has facilitated over 4,000 technology development projects and collaborated with more than 1,300 experts.

6.	**Conclusions and recommendations.** Summarize the conclusion and provide recommendations to improve the technology transfer ecosystem in the Economy.	Max. ½ page

1. Enhancing Industry-Academia Collaboration
   - Promote Collaborative Research: Strengthen partnerships between universities and industries through joint research initiatives and internships.
   - Facilitate Knowledge Exchange: Create platforms and events where academia and industry can exchange ideas and discuss potential collaborations.
2. Improving Intellectual Property (IP) Management
   - Streamline IP Processes: Simplify and speed up the process of patent filing and IP management by establishing clear guidelines and support systems.
   - Develop IP Sharing Models: Create equitable models for IP ownership and revenue sharing between researchers, universities, and industry partners.
3. Increasing Funding and Financial Incentives
   - Expand Financial Support: This includes grants for commercialization, seed funding for startups, and tax incentives for companies that invest in R&D.
   - Incentivize Private Investment: Offer tax breaks and other financial incentives to private companies that collaborate with academic institutions on R&D projects.
4. Capacity Building and Training
   - Strengthen the capacity of TTOs: Provide them with the necessary resources, training, and staff to effectively manage technology transfer activities.
   - Provide specialized training programs for researchers and industry professionals: Conduct training on R&D commercialization, IP management, and entrepreneurship.
5. Strengthening Policy and Regulatory Frameworks
   - Review and Update Policies: Regularly review and update domestic policies related to technology transfer and research commercialization to ensure they are aligned with global trends and local needs.
   - Facilitate Regulatory Approvals: Streamline the regulatory approval process for new technologies and products to reduce the time it takes to bring innovations to market.

	NAME THE ECONOMY: Indonesia	
1.	**Economic context.** Describe the economic context.	Max. ½ page

Technology Transfer in Indonesia includes various aspects such as identifying and selecting technologies with potential commercial value, protecting intellectual property rights, negotiating license agreements, providing technical assistance, and supporting commercialization efforts. Indonesia also has made various efforts to facilitate technology transfer, such as establishing technology incubators and science parks, funding research and development, and promoting partnerships between research institutes, industry, and the government. Overall, the concept of technology transfer in Indonesia focuses on promoting innovation, increasing competitiveness, and generating economic growth through the development and commercialization of new technologies (Hendrix et al, 2024).

The establishment of BRIN is a policy aimed at supporting the acceleration of technology transfer. BRIN (based on Presidential Regulation Number 78 of 2021) has integrated all resources, including human resources, infrastructure, and budgets from government research institutions across various ministries and agencies, into a single entity. BRIN is responsible for science, technology, and domestic innovation policies, as well as the implementing agency for research and innovation.

2.	**Main R&D and technology transfer policies.** Summarize the primary R&D and technology transfer policies, focusing on their objectives, key initiatives, sector where the technology transfer case occurred, and institutional roles.	Max. ½ page

Based on domestic Research Priority (Presidential Regulation of the Republic of Indonesia Number 38 of 2018 concerning the Research Master Plan (RIRN) for 2017–2045), the research focus includes Food, Energy, Health, Transportation, Engineering Products, Defense and Security, Maritime Affairs, Social Humanities, Education and Cultural Arts, as well as Multidisciplinary studies. In line with the Industrial Development Master Plan, which has established priority industries until 2035, there is a need for the development and utilization of technology, creativity, and innovation. The government (Bappenas and BRIN), in collaboration with the industry, is developing human resource requirements with competencies aligned with industry needs, as well as the technology and innovation necessary for the development of the industry.

BRIN plays a role as a provider of domestic research infrastructure and serves as a collaboration hub for science and technology-based activities open to all sectors (academia and industry). In the implementation, PRIs (BRIN) partners with Academia and Industry. PRIs (BRIN) are significant sources of innovation, engaging in activities like ideation, execution, IP registration, valuation, promotion, and contracts. Academia focuses on knowledge creation, diffusion, and absorption through formal and informal interactions, licensing, start-ups, and joint operations. Industry plays a crucial role in commercializing innovations, identifying product markets, and engaging in technology absorption. Collaboration among these sectors is crucial for effective technology transfer, with actors like inventors, intermediaries, and partners playing key roles across different stages of the process.

3.	**Status of R&D and technology transfer.** Provides an overview of current R&D and technology transfer activities and their effectiveness in bringing innovations to market.	Max. ½ page

Science, technology, and innovation (STI) promoted as triple-helix collaboration between university, private/industry, and public sectors. Therefore, the mechanism needs to focus on improving things, as follow:

- the management of science and intellectual property deriving from scientific research;
- research ethics approval, research data and publication repository;
- research and technology innovation depository for patent or other types of intellectual property rights derived from scientific processes;
- prepares researchers to create output or innovation that are readily available for marketization in collaboration with business and industry – with concern to society and environment issues.

In this context, BRIN provides funding schemes for start-ups related to the development of livestock applications based on machine learning, Anyer Tourism e-Commerce applications for souvenirs and e-ticketing, commercialization of robotic therapy technology as a solution in the era of digital health, and more.

4.	**Case of public policies in technology transfer and innovation management.** Describe a technology transfer public policy implemented and the sector where the technology transfer case occurred.	Max. ½ page

The role of research, technology, and innovation in shaping policy is crucial. The downstreaming of research results (technology transfer) to users, particularly in the industry, is necessary to bridge the gap between research and industrial needs. To support technology transfer, there are at least three key actors involved in the policy: 1) BRIN; 2) Ministry of Education, Culture, Research, and Technology; 3) Ministry of Communication and Information Technology.

BRIN implements various programs, as follows:

- Research and Innovation for Advanced Indonesia is research funding program provided to research institutions for science and technology novelty-finding activities. The activities are related to food, health, energy, aeronautics and space, life sciences and environment, electronics and informatics, manufacture and nanotechnology, even social sciences, economy, and public welfare.
- Barista (Research Innovation Assistance for Talents), aims to support talents, create collaboration and expand collaborative networks to increase universities research, development, assessment, and application activities.
- Research-Based Startup Company, aims to encourage the commercialization of BRIN's research results and the result of universities or research institutions and to develop independent, profitable, and sustainable research-based startups.

The Ministry of Education, Culture, Research, and Technology facilitates research collaboration between universities and industries through Kedaireka. Kedaireka serves as a funding program to encourage synergy between higher education institutions and the business and industrial sectors.

5.	**Case of technology transfer and innovation management program.** Describe a technology transfer program implemented and the sector where the technology transfer case occurred.	Max. ½ page

Health Sector
COVID-19 Research
BRIN Collaboration with private research institutions, universities, and the pharmaceutical industry, that have been recorded to yield result, one of which is Merah Putih Vaccine. It is a COVID-19 alternative vaccine in Indonesia, targeted to be exported. Medical devices such as GLP high flow Nasal Canuula-01, Vent-l, and RT Lamp Saliva are the products to combat COVID-19.

This program operates under Minister of Research and Technology Decree No. 51 of 2020, in alignment with BRIN's transformation process through BRIN Decree No. 13/K/KPT/2021 on the Research and Innovation Consortium for the Acceleration of Handling the Coronavirus Disease 2019 (COVID-19) Pandemic. This approach has made research more focused and orchestrated, allowing financial resources, non-financial resources, and infrastructure to be directed toward the project.

In its process, the industry has been involved from the beginning (engagement was established from the start), particularly for medical devices, where there is a direct demand from the industry for further research related to the development of medical devices.

6.	**Conclusions and recommendations.** Summarize the conclusion and provide recommendations to improve the technology transfer ecosystem in the Economy.	Max. ½ page

Technology transfers began to impact the performance and productivity of the industrial sector as the commercialization of innovation began to meet market needs. The role of technology transfer in supporting product commercialization depends on sectors that have strategic value derived from equipment, skills, knowledge, processes, and practices. By encouraging technology transfers, domestic strategies can be reinforced and relationships between key actors and consumers can be developed.
Recommendation
There are at least 5 recommendations:

- Ensuring research priority setting for research continuity
- Redefining inventors' orientation towards market & commercialization
- Encouraging the industry involvement since the early phase of knowledge creation to increase invention readiness
- Enhancing the competence of intermediaries for bridging invention to market;
- Policy support for market development

Presented by: Andi Risdawati Alwi Paluseri

	NAME THE ECONOMY: Peru	
1.	**Economic context.** Describe the economic context.	Max. ½ page

Following the COVID-19 pandemic, Peru has experienced a moderate economic recovery, driven by rising mineral prices. Mining remains a key sector, but faces challenges related to environmental impact and conflicts with local communities. Agriculture is also vital, with products such as coffee and asparagus, although it faces modernization issues and vulnerability to climate change.

Tourism, affected by pandemic restrictions, is in the process of recovering, with the government promoting the domestic economy as a cultural and ecological destination. Nevertheless, the economy faces significant challenges, such as high labor informality and persistent inequality. Informality limits the government's ability to collect taxes and provides less security for workers. Economic and social disparities, especially in rural regions and indigenous communities, remain a crucial problem.

Political stability and governance are also key factors; corruption and instability have affected investor confidence. To move forward, Peru needs to diversify its economy, invest in infrastructure, and improve education and job training, while combating inequality and fostering more inclusive development.

2.	**Main R&D and technology transfer policies.** Summarize the primary R&D and technology transfer policies, focusing on their objectives, key initiatives, sector where the technology transfer case occurred, and institutional roles.	Max. ½ page

In Peru, the primary R&D and technology transfer policies in the health sector are led by the National Institute of Health (INS) and the National Council for Science, Technology, and Technological Innovation (CONCYTEC). These institutions promote health-related research and innovation, often in collaboration with universities and international partners. Also, the government has established funds and programs to support innovation in health technologies. These funds are used to finance research projects, clinical trials, and the development of new medical devices and pharmaceuticals. Universities and research centers are increasingly setting up TTOs to facilitate the commercialization of research outcomes. These offices help bridge the gap between research and market, ensuring that innovations reach healthcare providers and patients.

3.	**Status of R&D and technology transfer.** Provides an overview of current R&D and technology transfer activities and their effectiveness in bringing innovations to market.	Max. ½ page

Research and Development Initiatives: The INS and the National Council for Science, Technology, and Technological Innovation (CONCYTEC) play crucial roles in promoting health-related research. INS focuses on epidemiological studies, disease prevention, and public health initiatives, while CONCYTEC funds and supports various health research projects. Several Peruvian universities often collaborate with international organizations and the private sector to advance medical research and innovation.
Technology Transfer and Innovation: Universities and research institutions are establishing TTOs to manage the commercialization of research findings. These offices help in patenting innovations, finding licensing opportunities, and facilitating industry partnerships. They play a vital role in translating academic research into market-ready products.
Regulatory Improvements: Efforts to streamline the regulatory framework are underway. This includes simplifying the registration processes for new medical products and improving the efficiency of the approval system. These changes aim to accelerate the market entry of new health technologies.
Effectiveness and Impact: Despite progress, there are challenges in scaling up innovations. Issues include limited funding for early-stage research, a lack of infrastructure for large-scale clinical trials, and difficulties in navigating regulatory processes. Additionally, the commercialization process can be slow and complex, impacting the speed at which new technologies reach the market. The effectiveness of R&D activities is often measured by improvements in disease management, increased access to advanced medical technologies, and enhanced healthcare outcomes.

4.	**Case of public policies in technology transfer and innovation management.** Describe a technology transfer public policy implemented and the sector where the technology transfer case occurred.	Max. ½ page

In 2023, the INS implemented Directive N°067-INS/OGITT-V.01, which regulates technology transfer in health, with the purpose of contributing to the strengthening of innovation in the Health Sector. It is applicable to all institutional bodies and organic units of the INS.

5.	**Case of technology transfer and innovation management program.** Describe a technology transfer program implemented and the sector where the technology transfer case occurred.	Max. ½ page

During the pandemic, INS transferred biological material to several universities for the development of diagnostic kits, which translates into high social and public health value.

6.	**Conclusions and recommendations.** Summarize the conclusion and provide recommendations to improve the technology transfer ecosystem in the Economy.	Max. ½ page

Improving the technology transfer ecosystem in Peru involves addressing specific local challenges opportunities such as Strengthen Institutional Frameworks, Increase Funding and Support Mechanisms, Foster Collaboration and Networking, Improve Education and Training, Streamline Regulatory Processes, Promote Regional Development, and Leverage International Cooperation.

Presented by: María del Carmen Águila

	NAME THE ECONOMY: PERU	
1.	**Economic context.** Describe the economic context.	Max. ½ page

Peru's economy is based on the extractive industry, and the sector for processing raw products to generate added value is very incipient.
Peru's economic sectors are very diverse and include agroindustry, minerals and oil extraction, fishing, and so on. This diversity, combined with the intrinsic heterogeneity of Peruvian regions, makes it very difficult to find "one-fits-all" strategies in general.

2.	**Main R&D and technology transfer policies.** Summarize the primary R&D and technology transfer policies, focusing on their objectives, key initiatives, sector where the technology transfer case occurred, and institutional roles.	Max. ½ page

The main R&D and technology transfer policies have been concretised in the SINACTI, which aims to articulate the governmental organisations for R&D and technology transfer and promote this kind of activity in the economy.

SINACTI's strategic level is represented by Concytec, its governing body. The implementation level consists of Prociencia (for R&D, mainly targeting research initiatives), Proinnovate (for innovation and entrepreneurship, mainly targeting businesses), Inacal, and Indecopi. The execution level consists of the organisations carrying out scientific activities.

3.	**Status of R&D and technology transfer.** Provides an overview of current R&D and technology transfer activities and their effectiveness in bringing innovations to market.	Max. ½ page

R&D and technology transfer in Peru are still in their early stages. Several initiatives for business and scientific organisations have been launched and have funded a relevant number of R&D and innovation projects throughout the economy. However, relevant challenges have not yet been addressed.
One of the existing gaps refers to the lack of tools allowing the transition from R&D with proof of concept to technological innovation in society. This poor connection does not allow proven ideas to positively impact society.
Another important gap is the lack of existing regionalisation/contextualisation of the funding initiatives, which target strategic and specialised challenges for the whole member. Given the previously explained heterogeneity of the Peruvian sectors and regions, it is important to provide R&D and Innovation funding that targets specific challenges and opportunities of each Peruvian region. This approach can complement the domestic-level initiatives but puts a special effort into having a greater impact in each region by solving region-specific problems with solutions based on R&D.
Another relevant issue is the lack of scientific-related talent in the member economy.

4.	**Case of public policies in technology transfer and innovation management.** Describe a technology transfer public policy implemented and the sector where the technology transfer case occurred.	Max. ½ page

I do not recall a successful technology transfer public policy in the economy.

5.	**Case of technology transfer and innovation management program.** Describe a technology transfer program implemented and the sector where the technology transfer case occurred.	Max. ½ page

I do not recall a successful technology transfer program in the economy.

6.	**Conclusions and recommendations.** Summarize the conclusion and provide recommendations to improve the technology transfer ecosystem in the Economy.	Max. ½ page

It is essential to contextualise the programs supporting R&D and innovation to address each Peruvian region's specific challenges and opportunities. Peru has a large territory with very dissimilar regions regarding R&D and technology transfer maturity, existing talent for R&D, and gaps to close. The programs shall be adapted to the gaps and needs of each Peruvian region.

There is a lack of scientific-related talent (scientists, research project managers, technology managers, experts in technology entrepreneurs, etc.) in Peru. This issue prevents ideas from reaching their targets in society.

Finally, it is also important to raise awareness of the benefits of using R&D-based solutions in solving the main challenges and taking advantage of opportunities to improve society. Given the global importance of these goals, a focus on the SDGs is also important.

Presented by: Mario Quinde

	NAME THE ECONOMY: Peru	
1.	**Economic context.** Describe the economic context.	Max. ½ page

Peru's economic context, from the perspective of research and innovation, presents both significant challenges and opportunities, especially when considering its vast wealth of natural resources. Despite sustained economic growth in recent decades, the economy faces limitations in its capacity to generate and apply scientific and technological knowledge on a large scale. Investment in research and development (R&D) remains low compared to other economies in the region, representing only 0.16% of GDP in 2022, according to the World Bank. This figure limits the potential to innovate and add value to the economy, particularly in key sectors such as agribusiness and biodiversity, where Peru has enormous potential to lead in sustainable innovation and development of new technologies. Leveraging these resources more strategically could turn Peru into a benchmark in natural resource-based innovation, but to do so it is crucial to increase investment in R&D and strengthen the links between academia, industry and government.

2.	**Main R&D and technology transfer policies.** Summarize the primary R&D and technology transfer policies, focusing on their objectives, key initiatives, sector where the technology transfer case occurred, and institutional roles.	Max. ½ page

The government has implemented public policies focused on fostering innovation and technology transfer, with the purpose of diversifying the economy and improving the domestic's competitiveness. Among these initiatives, the ProInnovate program stands out, which includes projects for the Dynamization of Regional Innovation and Entrepreneurship Ecosystems. These projects seek to strengthen regional ecosystems through the creation of collaborative networks between local actors, such as universities, companies and regional governments. At the same time, Concytec promotes Law 30309, which offers tax benefits for investment in R&D&I, a key instrument to encourage companies to invest in research, development and innovation by providing them with significant tax deductions. Although these measures have the potential to strengthen the domestic's innovation infrastructure, challenges remain, such as low private investment in R&D and the need to improve the technological absorption capacity of Peruvian companies.

3.	**Status of R&D and technology transfer.** Provides an overview of current R&D and technology transfer activities and their effectiveness in bringing innovations to market.	Max. ½ page

In terms of technology transfer, the Centros de Innovación Productiva y Transferencia Tecnológica (CITE) have played a crucial role in providing technological services and advice to small and medium-sized enterprises (SMEs), helping them to improve their competitiveness. However, the ability of these centers to convert innovations into commercial products faces significant challenges, such as a limited connection with the business sector and the absence of a strong market for technologies.

Despite these efforts, the effectiveness of R&D and technology transfer activities in Peru in bringing innovations to market remains incipient. Among the main challenges are the need to increase investment in R&D, strengthen collaboration among the actors in the innovation ecosystem, and develop an infrastructure that effectively facilitates the commercialization of innovative technologies.

4.	**Case of public policies in technology transfer and innovation management.** Describe a technology transfer public policy implemented and the sector where the technology transfer case occurred.	Max. ½ page

5.	**Case of technology transfer and innovation management program.** Describe a technology transfer program implemented and the sector where the technology transfer case occurred.	Max. ½ page

The formation of the TISC NETWORK (RED CATI) in Peru has been a key public policy in the management of technology transfer and innovation, significantly boosting the registration of patents and other intellectual property rights. In 2023, the economy experienced a 29.61% increase in intellectual property registration applications, with 3,665 applications filed compared to 2,830 in 2022. This increase reflects the success of policies focused on strengthening the protection of creativity and innovation at the domestic level.

Within the Dirección de Invenciones y Nuevas Tecnologías (DIN), 1,340 applications for invention patents and 417 for industrial designs were registered in 2023. In addition, 691 patents were granted, highlighting the positive impact of the TISC NETWORK in supporting innovators and improving the intellectual property infrastructure in the member economy.

6.	**Conclusions and recommendations.** Summarize the conclusion and provide recommendations to improve the technology transfer ecosystem in the Economy.	Max. ½ page

Conclusions:
Peru's economic context offers both opportunities and challenges for research, development, and technology transfer, especially in high-potential sectors such as agribusiness and biodiversity.
Challenges persist in converting research into marketable innovations, largely due to limited private sector participation and the need for stronger collaboration between academia, industry, and government.
The formation of the TISC Network (RED CATI) has been a positive step in strengthening the domestic's intellectual property framework.

Recommendations:
Increase Investment in R&D: Expand public funding, incentivize private sector investment through more attractive tax benefits, and explore international partnerships to bring additional resources and expertise.
Strengthen Collaboration: Further enhance collaboration between academia, industry, and government. This could involve creating more strategic partnerships and forming innovation clusters.
Develop a Technology Market: Peru should focus on developing a more robust market for technologies. This could include creating platforms for technology exchange, providing greater support for the creation of technology-based companies, and establishing the legal framework for spin-offs.
Improve Technological Absorption Capacity: Implement targeted training programs, provide access to modern technologies, and offer better support for the adoption of advanced manufacturing processes.
Presented by: Reynaldo Raygada

	NAME THE ECONOMY: Peru	
1.	**Economic context.** Describe the economic context.	Max. ½ page

The economy has been dealing with some issues related to meteorological phenomena, such as the Yaku cyclone and "el niño" phenomena and problems related to water deficit which it is leading us to deacceleration of our growth as economy. However, in order to overcome those situations, the Peruvian government, through the ministry of economy and finance, has launched this year a plan called "juntos" (together, in English), in order to boost the economy and reverse the structural slowdown.

These actions are focus on different fields. For instance, i) Giving lower rates for Micro, small and medium firms, ii) Financing for agriculture up to PEN1,000 million to mitigate the effects of the "el niño" phenomena and support for small farmers, iii) The Promotion of investment in renewable energy, among others.

However, this plan also involved boosting economic growth through productive development, creating an impact on production chains and innovation. Basically, the intervention involved the investing of PEN105 million of soles (around USD28 million), in order to support initiative in Research Development and Innovation (R&D&i) and technology transfer through 29 Centers for Productive Innovation and Technology Transfer (CITE) and the Technological Institute of Production

2.	**Main R&D and technology transfer policies.** Summarize the primary R&D and technology transfer policies, focusing on their objectives, key initiatives, sector where the technology transfer case occurred, and institutional roles.	Max. ½ page

Technology transfer policies start with the Law N° 21250, Law of the National System of Science, Technology and Innovation (SINACTI). This Law puts technology transfer in the third level of our Science, Technology and Innovation Policy, called level of "execution" as this procedure is done by Universities, Research Publics Institutes, firms, Centers for Productive Innovation and Technology Transfer, among others.

Even though we don't have specifics policies related to technology transfers (As a Ministry), we are part of the board of directors of the different institutions, such as the National Scientific Research and Advanced Studies Program (PROCIENCIA), which focus its effort on capture, manage and channel domestic and foreign resources destined for the activities of the domestic System of Science, Technology and Technological Innovation in the member economie.

In this context, the board approves and make observations or comments related to different competitions (initiatives) related to science, that include technology transfer. For instance, initiatives such as the binding initiatives for accelerate innovation, in order to improve the competitivity of Peruvian productive value chains. Also, other competitions as Public Research Institute self-assessment, lay the foundations in Public Research Institutes with the purpose of establishing the prior conditions related to human resources, financing and production in R&D; to implement the institutional self-assessment process through the implementation of an R&D&I Management Unit dependent on Senior Management

3.	**Status of R&D and technology transfer.** Provides an overview of current R&D and technology transfer activities and their effectiveness in bringing innovations to market.	Max. ½ page

Most of the transfer activities happen though different competitions develop and promoted by different actors, such as PROCIENCIA or the Peru Program for Technological Development and Innovation (PROINNOVATE). This implies that researchers, Research Publics Institutes, Centers for Productive Innovation and Technology Transfer, among other important actors of the sector, need to register for these contests to participate.

During this year, different contests held by PROCIENCIA, such as the Research, Development and innovation (R&D&i) projects with international participation CDTI Spain 2024 (in evaluation), and the Escalation Mode of Technologies contest (already closed), are good examples of how activities related to technology transfer are done.

On the other hand, PROINNOVATE have a contest called "Extension and Technology Transfer Centers" focused on co-finance the launch and implementation of the Strategic Plan of public CITE, to develop an adequate and effective offer of specialized technological services, technical assistance for adequate technological absorption in companies, services to improve their capacity to receive technologies. and strengthening its capacity to innovate.

4.	**Case of public policies in technology transfer and innovation management.** Describe a technology transfer public policy implemented and the sector where the technology transfer case occurred.	Max. ½ page

From the position of the ministry of economics and finance, we focused on the understanding of how different policies create an impact on the economy. In this context, and although there are not so many policies related about technology transfer, in 2015, the Peruvian government enacted the Law N° 30309 - Law that promotes Scientific Research, Technological Development and Technological Innovation, it's a tool that promotes tax benefits applicable to expenses in scientific research projects, technological development and technological innovation.

In this context, companies can obtain a deduction in their taxes if their projects are done directly by the taxpayer, or done through a scientific research centers, technological development or technological innovation domiciled in the member economy.

Through this policy, the idea is that companies could find synergies between different actor, such as this research centers focused, for example, in technology transfers as to obtain not just new solutions but also different approaches to the problem they want to solve

5.	**Case of technology transfer and innovation management program.** Describe a technology transfer program implemented and the sector where the technology transfer case occurred.	Max. ½ page

Even though the ministry does not implement transfer and innovation management program a good example is the one done by the textile and camelid CITE from Cusco, that put its efforts on the traceability of the Camelida Textile Production Chain with Blockchain Technology.

This traceability project will focus on recollect throughout the whole productive chain, involving the information about the camelid breeding and shearing, collection, categorization and classification, primary transformation of the shearing, the textile transformation, the design and development of the product, and the commercialization.

All this information will be provided by the same actors in the chain, which reinforces the trust of the information that is provided in blocks by the people that do the activity that will be registered, creating an efficient chain of information that ensures the reliability of the information.

6.	**Conclusions and recommendations.** Summarize the conclusion and provide recommendations to improve the technology transfer ecosystem in the Economy.	Max. ½ page

As an economy, it will be interesting to have an approach based on policies and regulatory tools, as the efforts done by now are principally based on practical initiatives (competitions) done by the actors that are in close interaction with the ones who need these services.

However, these efforts need a support based on policies and regulatory tools that could led to make those technology transfers not just easy but also, create an environment that could contribute to an interaction between all the actors of the sector. For example, simplify the interaction between the CITES and the Research Public Institutes.

This will make a technology transfer simpler not just for public institutions, but also for the actors in the private sectors (mostly, firms) that need that support in order to increase their development. And therefore, increase the economy.

Presented by: Gianmarco Guerrero

	NAME THE ECONOMY: PERU	
1.	**Economic context.** Describe the economic context.	Max. ½ page

According to Lloyds Bank (2024), for the past 25 years, Peru has encountered numerous setbacks such as an economic downturn as its GDP (Gross domestic product) declined in the first and second quarters of 2023, attributed to decreased private investment and consumption, possibly due to protests and increased political uncertainties. The latest projections from the Banco Central de Reserva del Perú (BCRP) pointed to a negative growth of 0.5% in 2023, while projecting an annual growth rate of 3% over 2024/25 thanks to the recovery of some key industries, including agriculture.
Lloyds Bank mentions that Peru's varied geography is reflected in the domestic's economy. The abundance of resources is found mainly in mineral deposits in the mountainous regions, while its extensive maritime territory has traditionally yielded excellent fishing resources. Agriculture contributes to 7.8% of Peru's GDP and employs 26% of the active population. The economy's main agricultural products are cotton, sugarcane, coffee, wheat, rice, maize, quinoa, and barley.

2.	**Main R&D and technology transfer policies.** Summarize the primary R&D and technology transfer policies, focusing on their objectives, key initiatives, sector where the technology transfer case occurred, and institutional roles.	Max. ½ page

Based on my personal incipient experience, I would like to mention two cases:

- Technology transfer of the development of aqueous polyurethane adhesive carried out from a Federico Villareal National University-Company Research Project funded by Innovate Peru and transferred to the company HACSA. The product obtained is available in Peruvian market and in some other Latin-American economies.
- Technology transfer of hot melt adhesives obtained in a Federico Villareal National University-Company Research Project funded by Innovate Peru and transferred to the company HACSA in 2016. The product obtained is available in Peruvian market and in some other Latin-American economies.

Institution: UNFV (Vice-Rectorate for Research)
Role: Principal researcher
In those years the University did not have a policy or regulations regarding technology transfer.

3.	**Status of R&D and technology transfer.** Provides an overview of current R&D and technology transfer activities and their effectiveness in bringing innovations to market.	Max. ½ page

In our domestic economy, academia still has incipient experience in technology transfer. It is still complex in our ecosystem to bring the technological products resulting from research to the market. The researcher/innovator/inventor does not have sufficient support from either the domestic economies or private entities to finance these technology transfer processes. This implies having sufficient knowledge and preparation for Development, to package it, to do a market study, marketing strategies and knowledge about legal administrative aspects that commonly, due to the very nature of the researcher, we do not have that preparation. This would imply the need to hire the services of technology managers (which requires a budget or training for these purposes, investing time and money). These processes would mean that the researcher must leave his usual activities to concentrate on achieving technology transfer. If he does not receive support to achieve this from his institution or others, then it is very difficult.

4.	**Case of public policies in technology transfer and innovation management.** Describe a technology transfer public policy implemented and the sector where the technology transfer case occurred.	Max. ½ page

Brasil

Embrapa and Innovation in Agriculture

• Description: The Brazilian Agricultural Research Company (Embrapa) is one of the leading agricultural research institutions in Brazil. Embrapa has developed several agricultural technologies that have been successfully transferred to the productive sector.

• Specific Example: The development of soybean varieties resistant to pests and diseases has revolutionized Brazilian 77ompetencia. Genetic improvement technology and the development of new varieties have been transferred to agricultural companies, improving the productivity and sustainability of soybeans in Brazil.

• Impact: The adoption of these technologies has contributed to Brazil becoming one of the largest soybean exporters in the world.

5.	**Case of technology transfer and innovation management program.** Describe a technology transfer program implemented and the sector where the technology transfer case occurred.	Max. ½ page

I will mention some innovation management programs that have been successful in other economies such us Chile:

According to Choupay (2019), in the last decade, the total public funding for main actors of the Chilean Science, Technology and Innovation System has increased. Universities remain a fundamental part of the system spending more than 38% of Chile's total investment in research and development. It is estimated that the resources spent by universities in the last 7 years amount to USS1,200,000,000 in total. This has generated an increase in scientific productivity, reaching 7.900 Web of Science papers in 2014 (1.5 times more than the 5.406 papers in 2010) Choupay (2019), mentions that in response to the suggestions made on a report by the World Bank and the recommendations of the OCDE (2007), Corfo -the main public agency of innovation in Chile – began to move towards an ecosystem of technology transfer focusing firstly on strengthening human capital competencies; funding the training of professionals from universities and research centers in management, commercialization and transfer of Research and Development results.

6.	**Conclusions and recommendations.** Summarize the conclusion and provide recommendations to improve the technology transfer ecosystem in the Economy.	Max. ½ page

- In our domestic economy, innovation and technology transfer are still an incipient matter which implies the improvement of human resource capabilities as well as the search for strategies to achieve financing and support for the development of innovations, especially from a solid university-business link.

- There are successful cases of technology transfer in several Latin American economies that can serve as a model for working in this area in our economy. This symposium within the framework of APEC is an excellent opportunity for this exchange of knowledge and strategic alliances.

- There are cases of successful technology transfer in several Latin American economies that can serve as a model for working in this area in our domestic economy. This symposium within the framework of APEC is an excellent opportunity for this exchange of knowledge and strategic alliances.

Presented by: Luz Castañeda

Annex VI: Photos