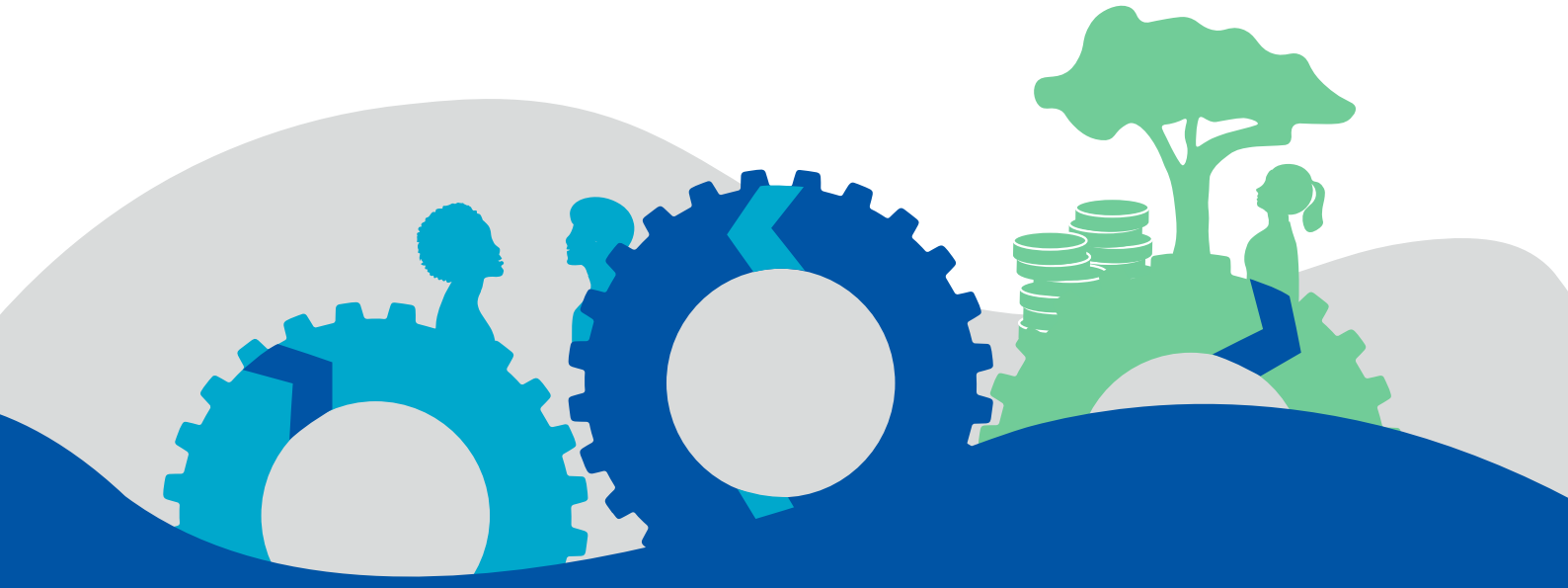
Commercialisation PLUS

Enhancing impact from research through commercialisation

A ‘How to’ guide for commercialisation professionals and researchers wanting to connect their research with the market for impact and sustainable development.



Edition for Viet Nam 2021

CSIRO

BỘ KHOA HỌC VÀ CÔNG NGHỆ

Authored by:

Jennifer Kelly (CSIRO)
Michaela Cosijn (CSIRO)
Minh Nguyen (CSIRO)
Renate Hays (CSIRO)
Nguyen Huu Can (VIPRI)
Nguyen Huu Xuyen (NIPTECH)
Cameron Johns (IIG)
Pham Duc Nghiem (NATEC)

Key contributors:

Tran Huong Giang (CSIRO)
Tran Thi Dinh (VNUA)
Nguyen Xuan Truong (VNUA)
Nguyen Viet Long (VNUA)
Nguyen Hoang Duong (VAST)
Le Thi Nhi Cong (VAST)
Le Thi Thu Huong (VAST)
Phan Tien Dung (VAST)
Le Nguyen Doan Khoi (CTU)
Luu Thai Danh (CTU)
Truong Minh Thai (CTU)
Nguyen Thanh Tung (CTU)
Luong Vinh Quoc Danh (CTU)
Nguyen Phuong Thao (Nguyen Khoi Farm)
Isaac Tucker (IIG)
Monica van Wensveen (CSIRO)
Edwina Hollander (Editor)

The recommended reference for this publication is:
Kelly, J. et al., 2021. *Commercialisation PLUS*. Canberra and Hanoi: Commonwealth Science and Industrial Research Organisation (CSIRO) and the Viet Nam Ministry of Science and Commercialisation (MoST).

This document has been developed in collaboration with the National Agency for Technological Entrepreneurship and Commercialisation Development (NATEC) which is Viet Nam's national agency reporting to the Ministry of Science and Technology (MoST) and responsible for leading the National Commercialisation Program; Australia's Commonwealth Science and Industrial Research Organisation (CSIRO), Australia's national applied research agency; and, the Impact Innovation Group (IIG), Australia's leading speciality innovation and commercialisation firm.

National Agency for Technology Entrepreneurship and Commercialisation Development (NATEC)

As Viet Nam's national agency reporting to the Ministry of Science and Commercialisation, NATEC is responsible for leading the National Commercialisation Program.

Commonwealth Science and Industrial Research Organisation

Australia's national science agency and innovation catalyst, solving the greatest challenges through fundamental and applied innovative science and technology.

Impact and Innovation Group

An Australian innovation services leader, with specialist expertise in designing learning programs across Asia-Pacific that transfer skills and knowledge in applying commercialisation processes.

The authors would also like to acknowledge the support of the following organisations in the testing and refining of tools and templates, and the production of case studies:

Can Tho University (CTU)

Can Tho University is a leading centre of education and training, scientific research and technology transfer, effectively contributing to the regional and national economic and social development through training high-quality human resources, fostering talents, and developing science and technology. Can Tho University is a key driving force for the development of the Mekong Delta.

Viet Nam Academy of Sciences (VAST)

Vietnam Academy of Science and Technology is the leading multi-disciplinary research institute in Vietnam, conducting natural science research and technology development, training high quality human resources. The Technology Application and Deployment Committee assists the President of VAST in managing intellectual property activities, technology implementation and commercialisation, and innovation.

Viet Nam National University of Agriculture (VNUA)

Viet Nam's National University of Agriculture is an education and research university specialising in agricultural and rural development. It is striving to be a multi-disciplinary and multi-campus autonomous university, including being a national and regional centre of excellence for creative innovation in training human resources, conducting top research, and applying knowledge and developing technology in agriculture and rural development.

The guide has been produced with funding from the Aus4Innovation program. The Aus4Innovation program is a partnership between the Australian Department of Foreign Affairs and Trade (DFAT), MoST and CSIRO. The guide aims to strengthen Viet Nam's innovation system, prepare for and embrace opportunities associated with Industry 4.0, and help shape Viet Nam's innovation agenda in science and technology.

Table of content

Introduction

Purpose of this guide

The framework developed for this Guide is called 'Commercialisation PLUS'. The Commercialisation PLUS process is founded on global best practice for innovation and commercialisation and is underpinned by Viet Nam's regulatory and legal frameworks for commercialisation.

This Guide is based upon several key foundational principles aimed at supporting Viet Nam's progress towards their sustainable development commitments and goals. The Guide focuses beyond commercial and economic outcomes *(i.e. profit)* and includes social *(i.e. people)* and environmental *(i.e. planet)* impacts, also known as the triple bottom line (see Figure 1.0). These outcomes are explicitly identified at the beginning of the commercialisation process to create awareness for the users, furthermore these focus areas are also integrated into the various steps within the Guide.

To ensure the Guide is practical, usable and relevant for the Viet Nam context: the process, supporting tools, templates, tips and example case studies presented in this guide, are sourced from Science and Commercialisation projects under the Aus4Innovation program, in partnership with the National Agency for Technology Entrepreneurship and Commercialisation (NATEC) and commercialisation practitioners at Can Tho University (CTU), Viet Nam Academy of Science and Technology (VAST) and the Viet Nam National University of Agriculture (VNUA). As such, the case studies presented are drawn from the agriculture and food industry; one of the largest sectors in Viet Nam.

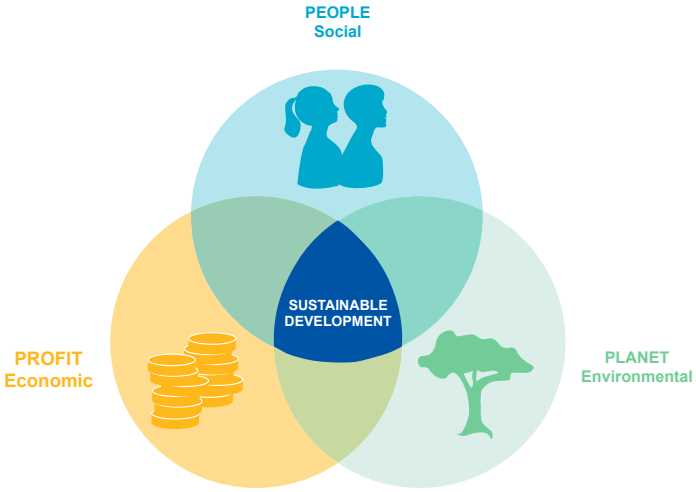


Figure 1.0: Triple bottom line

How to use this guide

This Guide is a practical reference for researchers and science commercialisation professionals in public universities and research organisations in Viet Nam, who are new to the commercialisation process. The Guide provides a comprehensive step-by-step, approach to lead users through the commercialisation process, taking them from science research in the laboratory to achieving impact that is beyond solely focussing on revenue, and incorporating societal and environmental considerations.

The Guide is divided into four chapters. Each chapter aims to build upon knowledge from previous chapters, however they can also be read independently, depending on the experience of the reader and their role in the commercialisation process.

Chapter 1:
Introduction to Commercialisation PLUS

In this chapter, readers will gain an overview of Commercialisation PLUS, including the guiding principles; why successful commercialisation results are important for sustainable development; how commercialisation can lead to impact; an overview of the key steps in the Commercialisation PLUS process; and, the important role of the Technology Transfer Office (TTO), or equivalent, in supporting successful commercialisation results.

Chapter 2:
Overview of key regulations and legal considerations underpinning Commercialisation PLUS

Chapter 2 provides an overview of the legal and regulatory requirements for transferring technology, including the transfer of public assets, protecting research and technology products and services, as well as disclosure processes and regulations within Viet Nam and at an international level.

Chapter 3:
A Step-by-step guide to the Commercialisation PLUS process

The individual steps of the Commercialisation PLUS process are explained in detail, with additional advice and guidance to support decision-making. This chapter also introduces a range of different tools, tips, case studies and useful references to support the implementation of these steps.

Chapter 4:
Supporting Tools and Templates

This chapter provides readers with the practical tools and templates, outlined in Chapter 3.

Special focus on commercialisation of agricultural and food applied research:

This Guide uses lessons and case studies from the commercialisation of agriculture and food technologies in Viet Nam. Agriculture and food technologies have unique conditions, which need to be considered when undertaking the commercialisation process these include:

- *Longer than average development timeframes* - affecting the return on investment for external parties.
- *Unique commercial vehicles* - requiring different commercialisation strategies.
- *Unique Intellectual Property (IP) protection mechanisms* - affecting the overall commercialisation strategy.
- *Different user-requirements* - altering project design and delivery timeframes, especially as many of the end users are smallholder farmers and small & medium enterprises (SMEs) that have limited purchasing power in Viet Nam.
- *Limited partner & funding models* - affecting the mechanism by which the commercialisation process is implemented, especially in Viet Nam where there are a high number of SMEs and smallholder farmers in the agri-food sector.
- *Complex regulatory frameworks* - potentially increasing cost, time and affecting ability to commercialise.
- *Long-term deals* - requiring ongoing partnerships with flexible funding sources.
- *Large technical skill requirements* - affecting entry to market.

Chapter one

Introduction to Commercialisation PLUS

What is Commercialisation PLUS?

Science Commercialisation refers to the process through which research concepts or products are introduced to the market. There are multiple steps to successfully transform ideas into marketable products and to generate income from licences and/or revenue from product sales *(also known as extracting financial return Intellectual Property for commercial purposes)*.

By connecting research with industry, the Commercialisation PLUS process aims to helps researchers build relationships with the private sector that facilitate the transfer of new products, or production methods, developed through research and launched into the market for real-world impact.

Using specially designed steps and tools, this process explicitly enables the delivery of impact beyond profit or economic benefits. Importantly, Commercialisation PLUS is a highly flexible process and it can be used and adapted at any stage of commercialisation. It builds on international best practice and is underpinned by Viet Nam's innovation policies and regulations to deliver sustainable development outcomes that also address social and environmental considerations, also known as the triple bottom line impact (Figure 1.0).

Commercialisation PLUS can be defined as:

A process for managing the transfer of research outputs to commercial partners for impact and sustainable development.

How is Commercialisation PLUS different?

Traditional science commercialisation approaches are founded on the basis that technology transfer is a linear process, which pushes a technology solution from the initial concept stage, to protecting it, to selling the idea, and to finally realising the economic impact. Experiences from around the world have highlighted that this approach has a number of challenges that limit sustainable impact from research and technology across the triple bottom line (Figure 1.0).

The Commercialisation PLUS approach addresses these shortcomings by transforming the traditionally linear approach, described above, to one that is inclusive, adaptive, and designed with sustainable impact in mind (Figure 1.1). This approach recognises that an exclusively positive impact is not possible, and trade-offs must be considered throughout the process if sustainable benefits and broader impacts are to be realised. Therefore, this commercialisation process recognises that the development of every technology solution needs to consider both the potential positive and negative impacts.

Inclusive Innovation can be defined as:

Mission-orientated policy and practice that has social and environmental values and local context at its core.

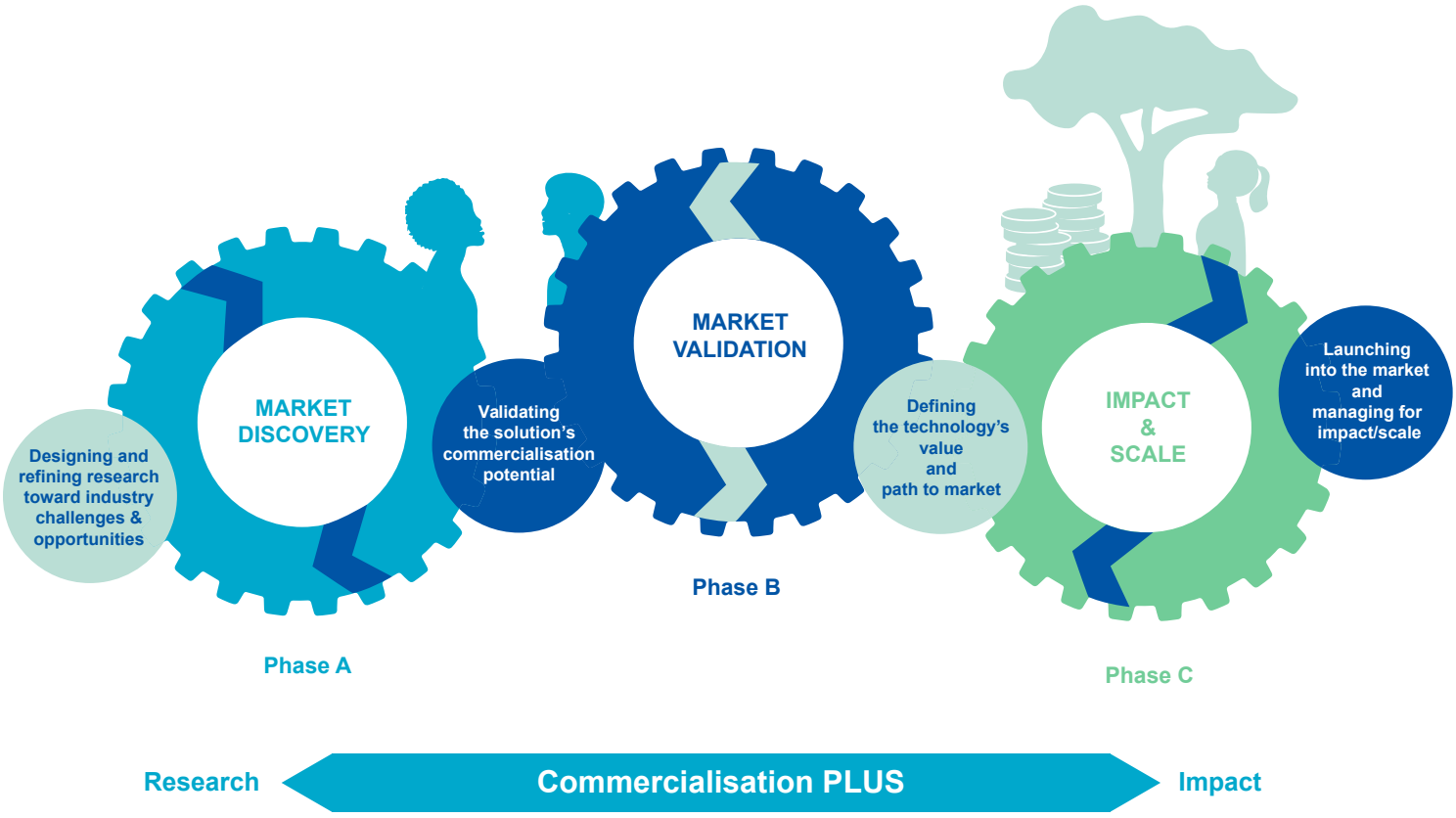


Figure 1.1: High-level overview of the Commercialisation PLUS process

The Commercialisation PLUS process is founded on the concept of inclusive innovation. It applies three guiding principles:

Directionality

The focus of Commercialisation PLUS is towards inclusive goals (Triple Bottom Line or Sustainable Impact)

Participation

Commercialisation PLUS includes the participation of beneficiaries (end users) in the process

Trade-Offs

Commercialisation PLUS includes clear measures to identify and mitigate the risks and potential negative impacts on society and/or the environment[1].

The Commercialisation PLUS process can be described as:

- **an interactive process** that identifies, plans, validates and executes the best strategy to market for a technology solution.
- a process that focuses the use of time, resources, and partnerships towards **sustainable development outcomes**.
- a process that **considers the national and international laws and regulations** that underpin the technology transfer process and market development, e.g. intellectual property protection, industry standards, etc.
- a process that helps **build foundations for strong relationships with industry and businesses** by helping researchers focus on identifying and addressing their clients' challenges and needs to create opportunity.
- a process that **focuses beyond profit towards broader impact and sustainable development** by identifying and understanding the larger system in which the technology solution is being applied. This includes the social, economic, and environmental benefits, possible trade-offs, the value chain actors and relationships required to support the path to market, as well as the management of risks and/or negative consequences for the wellbeing of current and future generations and nature.
- a process that **balances short- and long-term objectives**, including business/funding model(s) and impact.
- a process that **draws on a range of expertise**, from intellectual property (IP) management, technology valuation, industry relationship management, understanding the legal requirements, to developing contracts that support the achievement of all parties' goals.
- a process that is **built on inclusive relationship management**.

1. Adapted from Nesta (2020) *Strategies for supporting inclusive innovation: Insights from South East Asia.* UNDP.

Commercialisation PLUS builds on insights and lessons learnt

Traditionally, commercialisation has been defined as the process of introducing a new product or production method into commerce (Raymond Smilor, 2004)[2]. Yet using the traditional approach nowadays actually increases the likelihood of failure. While it may potentially result in initial financial benefit, it will often lead to long-term, unforeseen negative outcomes for the research organisation or for the population and the planet.

A simplistic focus on "idea-to-impact" leads to a linear approach for the development of new products and services and requires the assumptions and predictions of future market trends to be correct. This is especially problematic in sectors with long and expensive development cycles (such as the agriculture and food sectors), as by the time a product reaches the market, end users may no longer need or want the technology solution, product or service (see Example 1: *Watermelon variety*). Resources spent on such developments are considered a large risk as there is no guarantee that the initial assumptions were correct or that the problem was correctly defined in the first place. Companies wanting to manage this risk need to allow for an iterative, non-linear process to take into account this potential uncertainty instead of the out-dated linear approach, as described above.

The traditional process can also lead to pushing technology through to development without considering all the user groups of the technology (see Example 2: *Kiwi fruit*). To achieve commercial success, both customers and end users must derive value from a technology, so researchers need to understand the different value propositions for each different user group.

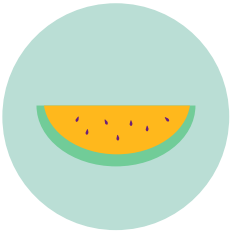
In other examples, applied research can often focus solely on the end user rather than on the customer who pays to bring the technology to market. As a result of the differing interests, the customer may then refuse to invest in the production and sale of the proposed technology. The focus only on the end user can also decrease the understanding of the unique value chain elements that are required for a technology, to ensure a successful uptake by the customer (see Example 3: *Livestock measurements*).

Significant unintended negative consequences can arise due to a lack of consideration for the broader potential impacts of a technology. This is especially important for novel technologies and production methods, (see Example 4: *Chemical Pesticide DDT)*. In this agricultural example, the new technology aimed at reducing pests and diseases to improve crop production achieved the desired result, however it also had some negative unintended impacts on the environment and the people using it[3].

It is therefore important that researchers consider as many potential impacts and consequences as part of the commercialisation process. The aim is to consider the range of potential consequences positive and negative, intended and unintended, from the application of new or novel technologies. Then, actively manage and adapt the commercialisation plan as appropriate to support the positive outcomes and impacts.

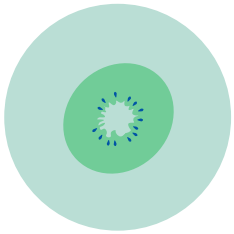
Furthermore, in the case of truly novel technologies, existing value chains may not yet exist. Therefore, in addition to the research and development (R&D) of the specific technology, new production and value chains either need to be created or an existing one adapted. This can subsequently create a struggle or a delay between producing a technology at scale and meeting the customer demand for that technology.

2. Smilor, Raymond and Matthews, Jana (2004). *University Venturing: Technology Transfer and Commercialisation in Higher Education. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*, Available at SSRN: *https://ssrn.com/abstract=1511535*
3. Slaughter, S. 2010. *Research Commercialisation. International Encyclopedia of Education. https://doi.org/10.1016/B978-0-08-044894-7.00882-4*



Example 1: Watermelon variety

A research project in the Philippines, that began in 2014, had a five-year project horizon and funding timeframe and focussed on the advantages in crop growth and yield of a specific variety of watermelon. However, at the end of the five years, the variety had lost market favour. The research was therefore not able to be commercialised without a significant additional project to transfer the findings to the new emerging dominant variety. This resulted in an economic loss due to the inability to create a financial return from the funding invested in the original research and development.



Example 2: Kiwi fruit

In 2018, New Zealand kiwi fruit farmers wanted to increase the sugar content in the fruit to accelerate ripening, reduce time to market, and ultimately increase profits. To support this, the technology solution that was developed focused on creating novel kiwi fruit traits that improved yield. Unfortunately, the new variety, with an increased sugar content, was susceptible to damage during transportation resulting in a very short shelf life and significant losses across the supply chain. Supermarkets and consumers had to discard large quantities of fruit before consumption and subsequently the industry almost went bankrupt. Many farmers lost their life savings or were forced to transition out of the industry where they had worked for years or decades. The devastation to the industry was the result of only focusing on one user group (the farmers) and not understanding the wider supply chain implications.

Example 3: Livestock measurement

An Australian research project began developing a livestock measuring device in 2019 which was high quality and top of the range. During the trials, farmers liked the solution and expressed great interest in purchasing the technology. However, when the researchers approached commercial manufacturers *(i.e. the "customer")* for the device, there was no interest in purchasing the technology as it only provided a single data collection option. The manufacturers saw that the future opportunity actually lay in a bundled system, with multiple data sources for farm management *(e.g. weather, feed, water management etc.)*. Even though the proposed solution by the manufacturers was an inferior device, it provided a comprehensive package which was better for the evolving needs of the end user (the farmers). By not speaking to the customer earlier in the commercialisation process, the researchers had not understood the wider strategic market (that the customer knew well) and therefore misunderstood what the customers would be interested in manufacturing.

Example 4: Chemical Pesticide DDT

Thirty-three percent of global food production is destroyed annually by insect predation and fungal infection. Starting in the 1940s, the synthetic insecticide "DDT" was used to control pest outbreaks. However, DDT's quick success as a pesticide and its broad use in many countries led to the development of resistance by many insect species and created significant adverse environmental impacts on wildlife and human health. For example, DDT led to the near extinction of many critically beneficial species, such as bees, thus further negatively impacting future crop production. Even though it was banned by most countries by the early 2000s, the chemical residues remain in the ecosystem and food chain due to bioaccumulation.

Why is Commercialisation PLUS important for Viet Nam?

Viet Nam's development since the late 1980s has been remarkable. Economic and political reforms launched in 1986 resulted in rapid economic growth, transforming one of the world's poorest nations into a lower middle-income country[4]. As a result, more than two thirds of the population were lifted out of poverty, with GDP per capita increasing rapidly over a short period of time.

However, the rapid economic growth and industrialisation has also not always been beneficial to the environment and natural assets. Impacts include over-exploitation of water, fisheries, soils and forests, as well as increasing pollution from agriculture and industry. These negative impacts on the environment reduce the opportunities to use and add value to these natural assets as well as leveraging agriculture for growth, resilience, and household wellbeing. At least a quarter of the population, who rely on these resources for income and livelihoods, are adversely affected by the resulting environmental degradation. Exacerbating the issue is Viet Nam's high vulnerability to climate impacts, especially in rural economies, which could negatively affect future growth of the country.

The transformation of research findings and innovations into useful products, processes and services can have a major impact on improving life and economic development by providing employment opportunities[5]. The commercialisation of new ideas and research is becoming increasingly critical for the development of the Vietnamese economy. Focusing on the commercialisation of its research enables Viet Nam to accelerate the delivery of solutions to both national and global problems, at scale, and attract new international investment and development opportunities. As a responsible member country of the United Nations, and to meet the requirements of its national regulations, the research commercialisation process in Viet Nam needs to integrate environmental, social and economic values into development objectives (see Figure 1.0). This will ensure Viet Nam meets its commitment to the Sustainable Development Goals (SDGs (see Figure 1.2)), as well as minimising the negative impacts of growth.

The benefits of explicitly addressing the triple bottom line (Figure 1.0) are the biggest drivers of Commercialisation PLUS. The potential impacts span areas such as healthcare, crop production, environmental rehabilitation and protection, sustainability, education, industrial applications and day-to-day life. The Commercialisation PLUS process focuses on catalysing the *economic benefit* from research for users, developers and the nation more widely. At the same time, this approach ensures that societal and environmental benefits are enhanced wherever possible and adverse effects are mitigated to create the widest impact for long-term sustainable development.

For research institutions, the additional benefits of pursuing a more holistic and sustainable research commercialisation agenda can be immense, including securing funding for new research opportunities, licensing and royalty fees, and new commercial entities *(i.e. start-ups and spin outs)*. Long-term partnerships and collaboration with the private sector and government can also emerge resulting in the co-creation of solutions. Taking applied research to market has the additional benefit of enhancing the reputation of research institutions nationally and internationally, attracting the best scientists and students, and potentially furthering opportunities for sustainable research commercialisation and impact.

4. World Bank, 2018. *Climbing the Ladder: Poverty Reduction and Shared Prosperity in Vietnam.*
5. Kylliäinen, J. (2019). *The Importance of Innovation – What Does it Mean for Businesses and our Society?* April 26, 2019. *https://www.viima.com/blog/importance-of-innovation*

How Commercialisation PLUS leads to sustainable development

Advances in science and technology are key to increasing productivity and, consequently, economic competitiveness. Industrialised economies are therefore becoming more reliant on innovation from research to address societal and environmental challenges and to deliver enhanced benefits. Equally, many organisations are orienting their research towards high-impact scientific activity, in line with specific mandates focussed on the 2030 Agenda and the Sustainable Development Goals (SDGs), such as poverty reduction or social inclusion (Figure 1.2).

Sustainable development is only achievable through the integration and acknowledgement of economic, environmental, and social concerns throughout the decision-making process[6].

Figure 1.2: The United Nations Sustainable Development Goals

As previously discussed, the Commercialisation PLUS approach is underpinned by inclusive principles. These principles incorporate the consideration of these trade-offs throughout the process (see Table 1.1).

6. Source: *https://sustainabledevelopment.un.org/content/documents/5839GSDR%202015_SD_concept_definiton_rev.pdf*

Table 1.1: How the inclusive approach of Commercialisation PLUS helps contribute to sustainable development

Inclusive principle	How it is applied in the Commercialisation PLUS process	Example
 **Directionality** The focus of Commercialisation PLUS is towards inclusive goals *(e.g. Triple Bottom Line or Sustainable Impact)*.	Economic, societal & environmental challenges and opportunities are explicitly considered in all phases of the process.	Impact readiness is an essential capability which is mainstreamed throughout all steps in the process Ex-ante and Ex-post impact tools are triple bottom line focused and explicitly include identification of impacts beyond financial or economic.
 **Participation** Commercialisation PLUS includes the participation of beneficiaries in the process.	End users engage in the process.	Market/end user readiness is an essential capability integrated throughout all of the steps in the process. End users are key informants about market needs, challenges, opportunities, and potential unintended consequences.
 **Trade-offs** Commercialisation PLUS includes measures to identify and mitigate the risks and potential negative impacts for society and/or the environment.	A systems approach ensures risks and potential negative impacts are considered and where possible they are addressed/mitigated in all phases of the project. The needs of socially diverse and disadvantaged groups are explicitly considered in all phases of the process as well as approaches to enhance benefits.	Relationships and networks are an essential capability integrated throughout all steps in the process. Ex-ante and Ex-post evaluation tools consider equitable distribution of benefits from commercialised technology solutions. Diverse research teams are encouraged, which helps to mitigate unknown biases and incorrect assumptions. The inclusion of diverse stakeholders in all phases of the process helps to identify and mitigate risks and assumptions and ultimately manage potential negative impacts for particular groups.

A common understanding of impact is:

An effect on, change or benefit to the economy, society and environment, beyond contributions to academic knowledge.

Both positive and negative impacts can be generated through a successful commercialisation process. This arises as a result of different products and services becoming available to customers and end users, thus causing changes in work practices, processes, or consumer attitudes and behaviours, etc. However, to achieve specific impact objectives such as the SDGs, impact cannot be left to chance but must be managed explicitly and strategically.

Impact is created through many different mechanisms, of which commercialisation is one. Many impacts that result from commercialisation can also be non-market based or public goods *(e.g. a community's sense of wellbeing, or clean air)*.

The impacts from research commercialisation are generally only seen after research is commercialised *(i.e. brought to market)* and used by others outside of the research community. Impacts can be positive and negative, or intended and unintended.

Equally, not all impacts from science and technology commercialisation are positive, or equitably distributed. For example, when the automation of a factory process leads to unemployment of workers, the factory may benefit through increased productivity and growth and as a result can potentially offer new types of jobs.

It is therefore important to reflect upon and identify the range of potential benefits, trade-offs and risks that could result from the commercialisation of science and technology. This process of reflection needs to be applied to the wider value chain actors and end user groups (market) and not just the immediate customer (client) who will buy the research product) so these impacts can be managed, e.g. a skill retraining program could be developed for factory workers that may help them transition to other work.

Common definitions of social, environmental, and economic impacts are:

Economic

Impacts on an economic system at a local, national or global level such as changes in revenue, operating costs, profitability, gross domestic product, employment or investment returns.

Social

Impacts on the well-being of the surrounding and wider community. Social impacts include effects on health, equality, living standards, cohesion, resilience, security and safety practices. They are sometimes non-monetary.

Environmental

Impacts on living and non-living natural systems, including ecosystems, land, air and water.

Why should I use the Commercialisation PLUS approach?

When successfully executed, the Commercialisation PLUS process can transform research ideas into market products and/or services, resulting in benefits for universities or research organisations, companies, industries, regional and national economies, and society at large.

For example[7]:

- For **universities or research organisations** it can be a source of revenue that can be used to support future research.
- For **individual researchers and universities or research organisations**, it can help build a reputation as leader in producing solutions for industry.
- For **companies and industries**, it can support the ability to tap into advances in research without investing in internal R&D, thereby introducing new and different products that can drive the success of their businesses forward.
- For **regional and national economies**, it can bring new capabilities that help enhance economic growth, including more jobs, a more resilient GDP etc. For society and the environment in general, it can contribute to improved health, stronger biodiversity, less pollution, etc.

7. *https://techtransfercentral.com/what-is-technology-transfer/*

Special focus

How the Technology Transfer Office (TTO) can support Commercialisation PLUS

What is a Technology Transfer Office? *(or an office with similar function)*

Universities and research institutions are often referred to as the “engine rooms” for innovation. The Technology Transfer Office (TTO), or the staff providing the connection from research to industry, is known as the “window” into this engine room. A Technology Transfer Office helps to put in place measures that protect the intellectual property (IP) associated with these valuable innovations so that they can be commercialised and brought to the marketplace for the benefit of society.

A Technology Transfer Office is known by many names, including but not limited to: an innovation office or centre, an intermediation office, or a technology and services transfer office. It aims to help businesses connect with researchers from universities or research institutions, including through collaborative research projects, consulting, licensing of technology/intellectual property (IP), testing and analytical services, education or training, researcher secondments or exchanges with industry, and student start-ups and university spinouts, among others[8].

8. *https://u2b.com/2019/05/27/what-are-the-business-benefits-of-university-technology-transfer/*

Functions of a TTO

There is no single model for a university or research institute to follow when it comes to establishing a TTO. It is a big, multifaceted and complex job that requires dedicated technology transfer expertise and support team, including techno-legal and marketing experts, managers, and administrators, who serve as liaison officers between academic scientists and industry and also manage the university's Intellectual Property.

Examples of the functions that a TTO can fulfil include:

- Acting as first point of contact for industry, to help direct industry representatives to specific research expertise and to complement existing informal direct contacts between faculty and industrial representatives.
- Creating awareness and encouraging researchers to disclose their inventions.
- Working with patent attorneys to file and secure the protection of Intellectual Property (IP), e.g. patent, copyright, plant breeders rights, etc.
- Assessing the commercial potential of new inventions and managing strong IP portfolios.
- Facilitating connections to specialist expertise, such as market analysis expertise, contract expertise, marketing and branding, technology valuation, etc.
- Providing advice and/or leading negotiations with the prospective licensees.
- Mediating between the parties involved in the commercialisation process, including the inventors and various industries.
- Developing policies and regulations that set clear rules and procedures as well as helping to incentivise a culture around commercialisation.
- Educating researchers on commercialisation principles and strategies.
- Managing incubation and supporting spin-offs, including organising business plans and start-up competitions.
- Managing consultancies undertaken by researchers.
- Managing services and contract research.
- Providing researchers with insights into the marketplace and the local regional economy.
- Bridging the gap between invention and commercialisation requirements.
- Supporting researchers to meet with industry representatives to build trust and relationships.
- Promoting and marketing available technologies to potential licensees and industry partners.
- Supporting researchers and spin-off entrepreneurs securing funding.
- Supporting collaboration and partnership negotiations.
- Supporting the establishment and maintenance of innovation ecosystems, as well as support structures and relationships that promote innovation and economic, social and environmentally sustainable development.

Professional Expertise

Science commercialisation is a complex process that requires a broad range of skills and experience that span many disciplines, including technical, economic and social research and business or commercial experience.

Having diverse teams (e.g. gender, age, research backgrounds) in the technology transfer office is important for best commercialisation results, allowing for multiple perspectives and solutions. Just like research, commercialisation is a team sport and the best results are achieved by allowing all members of the team to apply their different knowledge and expertise to achieve the common goal.

Depending on the model of your TTO, these skills and experiences may be found within the TTO itself or within the broader network of expertise the TTO manages. Table 1.2 highlights some of the key expertise your TTO should either have or be able to facilitate for a researcher to support a successful Commercialisation PLUS process.

Table 1.2: Expertise supporting the Commercialisation PLUS process

	Steps	1	2	3	4	5	6	7	8	9
Expertise	Value Chain			✓						
	IP Protection Attorneys					✓				
	IP Portfolio Management			✓						
	Technology Valuation						✓			
	Market Analysis				✓					
	Research-Industry engagement Intermediation/Facilitation		✓		✓	✓	✓	✓	✓	
	Marketing & Branding					✓				
	Contract Management & Legal services				✓			✓		
	Business Development & Relationship Management	✓	✓		✓	✓	✓	✓	✓	
	Impact Evaluation		✓		✓	✓				✓

As highlighted in Table 1.2 the expertise required to support the Commercialisation PLUS process changes throughout the various steps and phases. Therefore, the key role of the TTO is to identify potential skill gaps and facilitate connections to allow the research team to focus on their strengths. To achieve this, TTO staff must be skilled in creating and building trust between researchers, industry as well as specialising in supporting experts to advance a technology solution along the Commercialisation PLUS process. TTO staff also need to manage a portfolio of projects that will require different expertise at different stages of the process.

What role does the Technology Transfer Office serve in the Commercialisation PLUS process?

A Technology Transfer Office (TTO) essentially acts as an interface between industry and researchers within a university or research institution.

This office traditionally plays several important roles in the process of commercialisation, including information broker, science marketer, and catalyst for academic entrepreneurs[9]. The role of a Technology Transfer Office could also include supporting the identification of promising intellectual property (IP) from a scientific finding and then guiding it into the commercial marketplace through licensing deals and industry partnerships[10].

To achieve this, the role of a TTO should revolve around direct and frequent contact with industry that creates familiarity and good contacts, enabling the connection between researchers and industry for potential application of Commercialisation PLUS.

Tip

TTOs can help move the Commercialisation PLUS process forward by keeping track of the researcher's progress to guide them on the next point of reflection. Therefore, accessing or leveraging the expertise and resources of the technology transfer office (or equivalent) early in the Commercialisation PLUS process can be beneficial and help accelerate the process and results.

9. Fassin, Y. (2000) *Innovation and Ethics Ethical Considerations in the Innovation Business. Journal of Business Ethics* 27, 193–203 (2000). *https://doi.org/10.1023/A:1006427106307*
10. *https://u2b.com/2019/05/27/what-are-the-business-benefits-of-university-technology-transfer/*

Special focus

Why is diversity and inclusion in your commercialisation and research teams important for Commercialisation PLUS?

Diversity and inclusion in your commercialisation and research teams is an important foundation for successful commercialisation outcomes and broader impact. Specifically, it refers to teams that include members that have both inherent diverse backgrounds *(i.e. traits you are born with such as gender, or ethnicity)* and acquired diverse backgrounds *(i.e. knowledge, acquired experience and expertise)*. Research has shown that teams that actively encourage and value the participation from people with different genders, ethnicity, ages, skills, experience and knowledge *(i.e. transdisciplinary teams)* are better at mitigating against the risks associated with 'group thinking' and unconscious bias[11].

As highlighted in the 'Special Focus: How the Technology Transfer Office (TTO) can support Commercialisation PLUS', the Commercialisation PLUS process requires participation from a range of people with diverse skills and experience that go beyond science and research, and include engagement, collaboration, partnership brokering, pitching, marketing, business development, etc. *(i.e. a transdisciplinary approach)*. Thus, diverse and inclusive teams are typically more effective at exploring and identifying solutions that best meet the different needs, values and behaviours of different markets (Figure 1.3).

Benefits of Diversity & Inclusion[12]

Diverse research teams:

- are more creative
- make better decisions
- have different research priorities, questions, and design from the start of their projects (e.g. health (drugs), safety belts, low fuel cookers etc.)
- create better solutions for industry and society

Diverse companies produce 19% more revenue as they are able to identify different market opportunities as well as opportunities for new products.

11. Catalyst (2020). *Why Diversity and Inclusion Matter*. June 24, 2020
https://www.catalyst.org/research/why-diversity-and-inclusion-matter/#easy-footnote-bottom-21-6361
12. Stanford University and European Union. 2011. *Gendered Innovations*.
http://genderedinnovations.stanford.edu/what-is-gendered-innovations.html
Powers, A. 2018. *A Study Finds That Diverse Companies Produce 19% More Revenue*. Forbes Jun 27, 2018
https://www.forbes.com/sites/annapowers/2018/06/27/a-study-finds-that-diverse-companies-produce-19-more-revenue/?sh=231dd42d506f

Figure 1.3: Gender diversity in society and business[13].

13. Apotheker, R., Pyburn, R. and Laven, A. 2012. *Why focus on gender equity in agricultural value chains? In: Challenging Chains to Change* Ed. Laven, A. and Pyburn, R. KIT.
https://www.cordaid.org/en/wp-content/uploads/sites/3/2013/02/Challenging_chains_to_change.pdf

Case study 1: Gender diversity in innovation

In India, a farming tool called a “hand-push seeder” was developed to facilitate the planting process, however they were too heavy for women to use, even though they are the primary planters. The women from the local community who were consulted, also identified the need for a tool that could remove weeds, which takes a lot of women’s time post planting. In 2017, the planters were modified to be lighter which meant both men and women could use it, and adding a weeding component substantially increased the useability and the market for the tool. The social benefit included women reducing their time in the field weeding, so that they had more time for other economic activities, as well as attending to family needs.

Case study 2: Multidisciplinary inclusion in tuber research

Maria Isabel Andrade is a female researcher from Cape Verde, currently working in Mozambique at the International Centre for Potatoes. Working with local communities across Africa, Maria has undertaken research on potato, sweet potato and cassava varieties for many decades. Core to her success has been her ability to listen to farmers, women in particular, and to identify the challenges they face in growing tubers. Her work developing varieties to meet the farmer’s needs has resulted in the development of over 40 drought tolerant and pest resistance varieties, which have been adopted by over a million farmers. Furthermore, female researchers or NGO workers are often able to talk to women more easily and facilitate adoption of new varieties grown near the home, as food and cooking is seen as women’s work, so Maria was most certainly able to leverage her privileged access to certain community groups to help implement change.

In addition, through her own research, and then collaborating with nutritionists, Maria came to understand the significant nutritional benefits of biofortified crops for malnourished people, especially during childhood and pregnancy.

One of her key strengths has been her ability to collaborate with a diversity of researchers including nutritionists and agricultural economists, as well as to work with businesses and NGOs to propagate and distribute the plant material taking an inclusive value chain approach. Maria won the 2016 World Food Prize and the 2017 Swaminathan Award for Environmental Protection.

Adapted from Bosques-Martínez, M. 2020. *Women Who Revolutionized Agriculture and the World: Part 2*. Dec 21, 2020 *https://www.womeninagscience.org/post/women-who-revolutionized-ag-2*

In summary

Gender diversity as an approach to innovation, add value to:

- Research by ensuring excellence and quality in outcomes and enhancing sustainability.
- Society by making research more responsive to social needs.
- Business by developing new ideas, patents, and technology.

Chapter two

Key regulations and legal considerations underpinning Commercialisation PLUS in Viet Nam

Introduction

Compliance with Vietnamese national laws and regulations governing the commercialisation process is fundamental to the Commercialisation PLUS approach. This chapter provides an overview of the legal systems in Viet Nam that guide the creation and protection of intellectual property (IP), technology transfer, as well as the Vietnamese market regulations that influence the commercialisation of technology products and services.

The aim of this chapter is to complement the practical steps and tools found in Chapter 3 and 4, while providing an overview of key foundational concepts for successful Commercialisation PLUS outcomes. Specifically, this chapter will demonstrate the role of IP protection, the various protection methods available for different types of technology solutions and how to apply for them, how to manage your IP assets, including conducting a technology valuation and managing infringements, as well as highlighting the relevant legal and regulatory considerations for successful commercialisation. For more detailed information, refer to Nguyen (2020)[14].

Research undertaken in Viet Nam's universities and research institutions is largely based on science and technology projects that are funded (fully or partly) from the state budget. Therefore, the commercialisation of these research results is also governed by regulations for the management and use of public assets. This chapter will thus provide key concepts and detail the regulations for intellectual property, which are created from science and technology projects which receive funding from the Vietnamese government.

14. Nguyen, Can H. (2020), *Managing Intellectual Properties of Businesses (Quản trị Tài Sản Trí tuệ của Doanh Nghiệp)*, Viet Nam Intellectual Property Research Institute, Ministry of Science and Technology, Hanoi, Viet Nam (in Vietnamese)

What are Intellectual Property and its Protection

Intellectual Property (IP) is an intangible asset, which includes "*creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce*"[15].

IP Protection is about the rights of the creator/inventor to safeguard how their new and/or existing idea is used by others. The development of an international IP protection system is governed by the World Intellectual Property Organization (WIPO), which is a specialised agency of the United Nations (UN) that was formed in 1967 with a current membership in 2021 of 193 states.

The goal of Intellectual Property Rights is to protect the results of creative investment, to promote innovation activities, to prevent illegal use of the creative results of others, and to reduce counterfeiting and piracy. The creation, protection, extraction of financial value from intellectual property and the enforcement of Intellectual Property rights is central to the Commercialisation PLUS process. Protecting your IP rights can reduce the risks of commercialisation by deterring competitors from using the protected IP of your technology solution.

Intellectual property

According to the World Intellectual Property Organization (WIPO), "intellectual property rights include rights related to scientific, artistic and literary works; artists' performances, sound recordings, and radio and television broadcasts; inventions in all areas of human activity; scientific discoveries; industrial designs; trademarks, service marks, indications, and trade names; protection against unfair competition and all other rights as a result of intellectual activity in the field of industry, science, literature or the arts".

As per the above definition, intellectual property, or an IP asset, is therefore also understood to (indirectly) include: "scientific, artistic and literary works, performances of artists ... as a result of intellectual activity in industry, science, literature and art".

Note

Viet Nam's system of laws on intellectual property regulates the protection and use of intellectual property in the civil and economic sectors *(i.e. investment, commerce, finance, customs)*. The two key guiding laws in this framework are:

- The Civil Code (2015) (Part Six: "Intellectual Property Rights and Technology Transfer"), and
- The Intellectual Property Law (2005, 2009).

For more information about these laws and other relevant laws, see the Special focus: "What are the legal and regulatory considerations and obligations that guide a Commercialisation PLUS journey?" at the end of this chapter.

15. *https://www.wipo.int/about-ip/en/*

What are the types of Intellectual Property Rights?

Intellectual Property Rights are governed by international and national legal instruments and rules. These regulatory systems guarantee that the owners can govern how their Intellectual Property asset (IP asset) is used by a third party and manage any violations of these "rights to use".

In Viet Nam, Intellectual Property rights are defined as "the rights of *organisations and individuals that are registered as intellectual property owners to protect their creations, including copyrights and rights related to copyright, industrial property rights and rights to plant varieties*"[16]. These Intellectual Property rights are then divided into following four categories:

i. **Copyright**: the right of organisations or individuals to works that are created or owned by them.

ii. **Related rights (related to "copyrights")**: the rights of organisations and individuals to performances, video recordings, broadcasts, satellite signals carrying encrypted programs, etc.

iii. **Industrial property rights**: the rights of organisations and individuals to inventions, industrial designs, layout designs of semiconductor integrated circuits, trademarks, trade names, geographical indications, and economic secrets, as well as a business created or owned by you and your right to oppose unfair competition, and

iv. **Rights to plant varieties**: the right of an organisation or individual to a new plant variety that has been specifically selected to be created or developed, or the rights that have been transferred from other researchers or organisations.

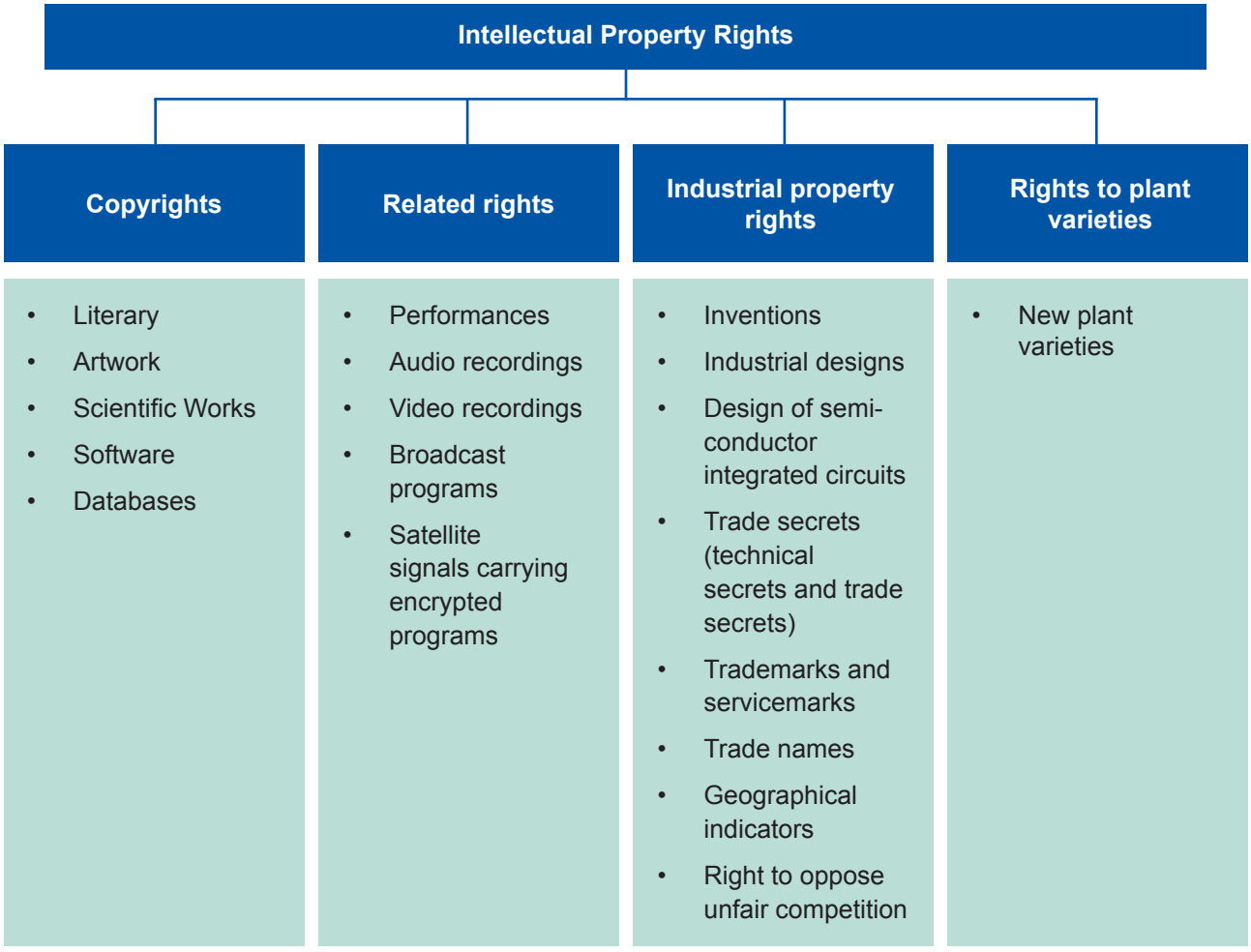


Figure 2.1: The four categories of intellectual property rights in Viet Nam

16. *The Intellectual Property Law* 2005, 2009

These four categories of rights are not mutually exclusive. Multiple types of IP protection can be applied to different aspects of one product or service. Each “right” serves a complementary, yet distinctive purpose. For example, a researcher may consider patentability for a technology solution that is designed to improve an existing fruit harvesting tool, while at the same time protecting an industrial design for the appearance of the tool, as well as a trademark protection of the graphic design of the labels attached to such a tool.

Together, these different forms of IP protection aim to distinguish the origin of their IP from similar tools made by other producers in the market. In principle, the more that IP rights are protected for a specific product or service, the more likely that it can be prevented from illegal imitation and reproduction.

To understand whether an intellectual property asset is eligible to be protected or not, you should consider: (i) whether or not the object is an IP asset; (ii) if it is an IP asset, then ascertain whether or not it has already been protected by any Intellectual Property rights by anyone else. Furthermore, researchers must consider both the scope and the restrictions of the various categories of intellectual property rights with respect to their technology solution and commercialisation goals. Typical constraints include the following:

- **The limit of the IP content:** the protection of the IP rights is specifically limited to the content of the registered IP.
- **Spatial (territorial) restrictions:** an intellectual property right exists only in the territory in which it is registered (most commonly at the national level).
- **Limited time (duration):** most types of intellectual property rights —especially with IP contents— exist for a certain period of time, as there is a different legal regulation for each type of IP.
- **Other restrictions:** such as restrictions by the rights of others, or for the benefit of the community, or the responsibility of IP owners.

Where possible define the exact limits of your IP to avoid potential disputes and conflicts of interest.

How do I protect my Intellectual Property (IP)?

Applying intellectual property rights is the key tool for projecting how your intellectual property is used. By protecting your IP, it means that the intellectual property legally belongs to the owner or the entity who registered it for protection.

In general, there are two forms of protection:

Note

Not all IP assets are protected. For example, unregistered or expired patents, do not belong to anyone in particular and are therefore free for all to use.

a) Register to protect legal IP rights with the Intellectual Property Office

This protection brings many benefits for commercialisation purposes, because it provides the legal recognition and protection of your intellectual property rights, retains your legal ownership over the intellectual property, and helps prove your intellectual property rights upon commercialisation or in the case of disputes or infringements. However, depending on the type of IP right, the legal registration of protection has spatial and time limits, as mentioned above.

b) Keep intellectual property confidential or secret

IP protection can also arise by keeping the intellectual property a secret. For example, Coca-Cola uses the category of rights known as “trade secrets” to keep its formula from becoming public. However, attempting to keep your intellectual property a secret during the Commercialisation PLUS process may have some practical limitations. To maintain secrecy of the IP, the owner needs to put strict security measures in place, for example specific confidentiality arrangements would be required when discussing or working with partners, potential customers, and even with team members or employees.

In Viet Nam, your IP can be legally protected by filing a registration application with the following agencies:

- For establishing rights to industrial property *(for examples refer to Figure 2.1)*, researchers need to register directly with the Vietnamese National Office of Intellectual Property under the Ministry of Science and Technology, at http://www.noip.gov.vn/web/guest/home.

  The registration form is available at:
  http://ipViet Nam.gov.vn/web/guest/bo-to-khai-trong-linh-vuc-so-huu-cong-nghiep

- Information for each type of industrial property, including definition, classification, and procedures, i.e. registration (both domestic and international), modification, transfer of application, protection title or patent, complaint and settlement, etc.) can be found at the following websites:
  - » For inventions, go to http://noip.gov.vn/en_VN/web/guest/sang-che-gphi
  - » For industrial design, go to http://noip.gov.vn/vi_VN/web/guest/kieu-dang-cong-nghiep
  - » For trademarks, go to http://noip.gov.vn/vi_VN/web/guest/nhan-hieu
  - » For semiconductor integrated circuit layout design, go to http://noip.gov.vn/en_VN/web/guest/thiet-ke-bo-tri

- For the recognition of copyrights and copyright-related rights *(for examples refer to Figure 2.1)*, researchers need to apply directly to the Copyright Office under the Ministry of Culture, Sports and Tourism, at http://www.cov.gov.vn

  The registration form is available at:
  http://www.cov.gov.vn/tin-tuc/to-khai-dang-ky-quyen-tac-gia

- For establishing rights to a plant variety *(for examples refer to Figure 2.1)*, researchers need to directly contact the New Plant Variety Protection Office, Department of Crop Production, under Ministry of Agriculture and Rural Development, at http://pvpo.mard.gov.vn/Default.aspx.

  The registration form is available at:
  http://pvpo.mard.gov.vn/DetailInfomation.aspx?InfomationID=IN00000302

The procedure to undertake IP registration is outlined in Figure 2.2, using a plant variety IP registration as the example.

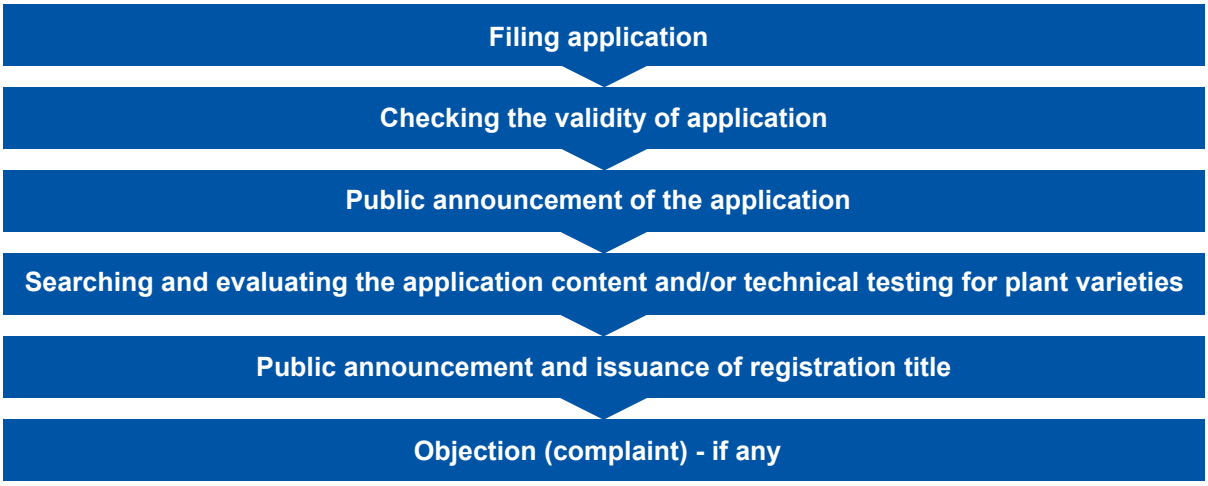


Figure 2.2. Example of the procedure of filing for IP projection of a plant variety

Tip

Familiarise yourself with the different IP rights before you apply for a legal protection.

Applying for the wrong protection can be costly and increase the risk of losing the opportunity of obtaining the most appropriate protection for your technology solution.

Note

The protection of intellectual property assets is limited to the terms and conditions that are governed by the respective category of intellectual property rights.

Consequently, the protection is only valid for the timeframe and scope outlined by the specific intellectual property rights that you select.

For example:

- A standard patent's duration is a maximum of 20 years, and
- Industrial design durations are for 15 years
- A trademarks duration is indefinite, provided renewal fees are paid every 10 years

Beyond the terms or scope for the category you have chosen, there is no protection unless renewal fees are continually paid to ensure patents and designs remain valid for the time period you chose.

How do I extract value from my Intellectual Property (IP)?

Extracting value from your intellectual property can be done either by selling all of your IP or just selling the right to use it. This is done to generate income that can help recover costs incurred from the creation and development of that IP asset, including the fees to register for IP rights, and for reinvestment (capital) to continue to develop and create new intellectual property.

The goal of using IP protection to generate financial returns can be an incentive for commercialisation. IP protection creates the possibility of earning revenue from a technology solution and also encourages industry to invest in new or novel technology solutions being introduced to the market because they can be confident that their investment is protected.

In order to extract value from intellectual property, researchers can consider the following main options:

- Commercialise intellectual property directly: produce and distribute products or services containing the intellectual property for commercial purposes,
- Transfer (sell) the right to use *(i.e. licensing)* intellectual property rights to another person or business, or
- Collaborate with others, using the value of your intellectual property as capital to jointly exploit and use an IP asset.

To select and proceed with any of the above options, researchers need to know the value of their IP and how to manage it financially. According to Vietnamese regulations, there are three key activities in managing the economic value of your IP:

- Determining the value of your intellectual property.
- Tracking and verifying the value of your IP asset.
- Determining the internal and external influences on the value of your IP asset.

a) Determining the value of your intellectual property

An IP asset valuation aims to forecast, or estimate, the future economic value of the IP asset, which is determined at the present time and expressed as a price. It helps researchers determine the most cost-effective way to use, sell, protect, insure, raise prices or exchange IP assets in the market. Technology valuation also provides a basis to help researchers accurately determine which part of their technology solution is new and worth paying for.

It is important to note, an independent technology valuation by a certified valuer is compulsory for anyone who is undertaking commercialisation for intellectual property that receives more than 30% of its funding from the Vietnamese Government[17]. If you are looking to commercialise a technology solution that does not meet this criterion, then an independent valuation that follows the steps outlined here is recommended as it can help inform your market negotiations.

Note

An Intellectual Property "valuation" is an independent appraisal of the value of your Intellectual Property assets. It can be a useful tool to help intellectual property owners determine the most economically efficient path to market for their technology solution.

17. *For more information, see Section 'What are regulations for IP assets created from Science & Technology projects funded by the state budget?'*

The following are common situations where it is advantageous to undertake a technology valuation include:

- **Undertaking a technology transfer (transferring the ownership or the right to use):** by appraising the value of the intellectual property for the transfer contract a fair price can be set.
- **Saving costs:** the maintenance of the IP assets brings benefits as well as costs, in particular, the cost to maintain the effectiveness of IP rights. The valuation of an exact price can help determine which types of IP should be kept for development and which should be removed (if as they no longer bring higher benefit than cost to business activities).
- **Contributing investment capital, joint venture or strategic alliance:** this is done by accurately determining the respective possession value (capital) of the business in an investment, joint venture project, or joint business association.
- **Undertaking equitisation/issuing shares (to shareholders):** by appraising the enterprise value and its assets when the business participates in equitisation or issuing shares to the public.
- **Donating IP assets to obtain preferential tax rates:** by appraising the IP assets that have been donated (usually to non-profit organisations) this value can be used as a basis so that tax authorities can calculate preferential tax rate for the donors.
- **Undertaking mergers & acquisitions:** the value is determined by appraising the enterprise value based on the proportion (contribution level) of the IP assets of the enterprise compared to the total market price.
- **Undertaking collateralisation and securitisation:** banks in some countries may accept IP assets as a collateral loan.

There are a variety of intellectual property valuation methods (or approaches), however these three are the most commonly used[18]:

i. the cost methods,

ii. the income methods, and

iii. the market methods (comparison[19].

Note

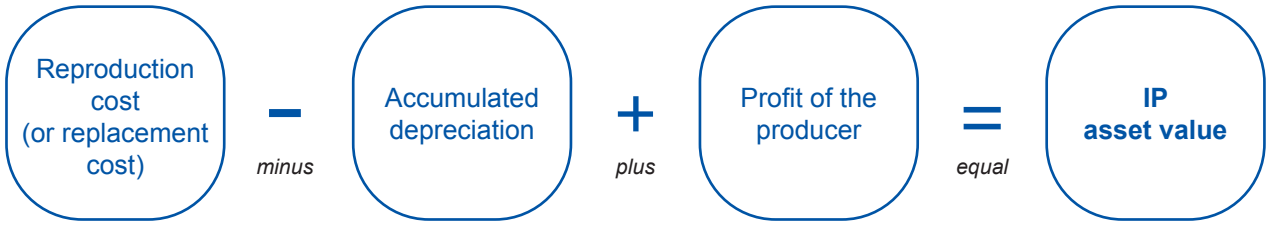
In principle, a valuation of intellectual property assets can only be made if the assets are clearly identified and separated from others.

i. Cost Methods

These methods are based on the cost to reproduce or recreate something of a similar nature. The value is based on the cost to acquire or construct a suitable asset of comparable utility. It is usually only applied to IP assets with uncertain future economic benefits (or income). It also does not account for wasted costs[20], nor does it consider any unique or novel characteristics of the asset.

18. *https://www.wipo.int/sme/en/value_ip_assets/*
19. See the *Circular 39/2014 / TTLT BKHCN-BTC* dated December 17, 2014, and *Circular 06/2014 / TT-BTC* dated January 7, 2014.
20. *For example, assets that exist but are not well utilised or used at all.*

The recommended formula for this method is:



The two types of costs identified above are:

- **Reproduction costs** are based on an estimation of the actual costs spent on creating and developing the IP asset (also known as historical costs), including the capital fund and the interest rate. This method is often used to appraise the IP asset in the research and development (R&D) stage.
- **Replacement costs** are based on an estimation of the cost spent on replacing the IP asset or developing other equivalent assets, including capital funds and the interest rate on the basis of the reasonable risk premium, in the case where the IP asset *(i.e. technology solution)* becomes outdated. During the negotiation of an IP asset trade, this method is often used to appraise the IP asset by comparing it to other assets that are similar in nature so that parties can make an equitable comparison.

ii. Income Methods

These methods value your intellectual property assets based on an estimate of expected future income streams and it is the most common valuation method used for intellectual property. It takes into account the potential income of the IP asset to determine the estimated economic benefit (or income) over its economic life cycle (note that the economic life cycle of IP asset may be shorter or equivalent to the period of protection of intellectual property rights). This method is often considered the easiest for those whose future cash flow can be estimated with some degree of reliability.

The most common Income Methods used in Viet Nam are as follows:

- **Relief of Royalty** is based on an assumed license fee for an intellectual property asset, based on market experience for equivalent assets. This method is commonly used in intellectual property transactions. The rule of 25% is frequently applied for this method to determine profit sharing between the owners of intellectual property *(i.e. the licensor)* and organisations or individuals who have the right to use the technology *(i.e. the licensee)*. For example, the licensor receives 25% of the profits from the branded or patented technology solution and the licensee receives 75% of the profits to cover the risks and costs of product development, manufacturing, and distribution.
- **Incremental Income or Premium Profit method** is based on the idea that the value can be measured by incremental earnings achieved by the asset evaluated against a comparable product that does not include the intellectual property.

iii. Market Methods

The Market Methods value your intellectual property by analysing the sale of equivalent intellectual property assets on the market. To use this method, public, active market, and price information needs to be available for comparison. The price information commonly used in this method is drawn from the available data on the royalty rates for comparable intellectual property assets that have been declared by relevant industries or businesses.

This particular method is based on available market information, so it is often used to establish approximate values to determine royalty rates, tax, and inputs for the income method[21].

21. *https://www.wipo.int/sme/en/value_ip_assets/*

b) Tracking and verifying the value of an IP asset

There are several different approaches to track and monitor the value of your intellectual property. Common approaches include:

- **Financial indicators**, e.g. current and future revenue, rate of return in the respective markets, cash flows converted to present values, and other financial metrics.
- **Customer surveys and distribution channels**, e.g. customer interest or customer awareness surveys, the "images" of the IP asset in customers' minds, and distribution channel coverage.
- **Future growth potential assessments**, e.g. the ability to expand products, increase market share/ number of customers, increase productivity, revenue, cost savings, etc.).
- **Time-trend analysis**, e.g. charts and graphs that compare the value of intellectual property over time to assess development trends.

c) Determining the internal and external influences on the value of the IP asset

There are a number of different factors that can influence the value of IP assets, including:

Internal factors	External factors
• Position of a business in the market, e.g. monopoly, etc. • Market potential of the technology solution • Reputation of the business • Scale of supply/ distribution of products to the market • Intellectual resources • Approach to select and calculate cost	• Bank interest • Inflation rate • Exchange rate • Availability of alternative IP assets • Consumer preferences • Market/sector demand related to IP assets • Government consumption policy, etc.

Understanding which factors influence the value of your intellectual property is important to ensure that any necessary adjustment can be made to your Commercialisation PLUS strategy.

Researchers can consult and seek assistance from appraisers if they need to commercialise and manage their intellectual property. Currently, there are more than 200 enterprises providing technology/IP valuation services in Viet Nam with more than 1,000 appraisers[22]. In particular, Viet Nam Centre for Science and Technology Evaluation (under the Ministry of Science and Technology) has the intellectual property valuation function (go to http://vistec.gov.vn/).

22. To access the list of appraisers go to the Ministry of Finance (*https://www.mof.gov.vn/webcenter/portal/btc/r/dn/ttdvtc/tttdvg;jsessionid=52rdcRGZz*).

d) What are my options in the case of a breach of Intellectual Property Rights?

In the case of infringement of intellectual property rights, researchers in Viet Nam should seek the assistance from the appropriate law enforcement agencies[23]. These agencies act as powerful authorities to protect intellectual property through the enforcement of penalties due to infringements of intellectual property rights (see Figure 2.3). Specifically, when an infringement of intellectual property rights occurs, a researcher can:

- Request the organisations and/or individuals that have committed the infringement of your intellectual property rights to immediately stop the infringing acts, publicly apologise, and compensate for damage, or
- Request the authorised state agencies to handle the infringements of intellectual property rights in accordance with the law.

If you choose to request help from an authorised state agency you can utilise:

a) **The People's Committees or authorised inspecting agencies:** who help resolve disputes or conflicts of intellectual property rights by subjecting the infringer to deterrent and preventive sanctions. The researcher can seek help from the People's Committees or inspecting agencies that specialise in science and technology, culture-sports-tourism, agriculture and rural development; market management; economic police (handling intellectual property violations occurring in the country); and customs (handling intellectual property infringement of import and export goods), or

b) **The court system:** helps resolve disputes or conflicts of intellectual property rights by civil (or even criminal) procedures. This option is most relevant when seeking compensation for civil damages due to IP rights infringements incurred by the owner of the intellectual property. In the Vietnamese judiciary system, the courts are the key agency that resolves intellectual property disputes (according to the Civil Procedure Code) and enforces measures to handle crimes related to intellectual property.

In addition, researchers can seek advice and support services from the following agencies:

- Intellectual property agency network,
  http://www.noip.gov.vn/web/guest/-ai-dien-so-huu-cong-nghiep
- Alliances for protection of intellectual property rights, such as the Intellectual Property Association, the Viet Nam Invention Association,
  http://www.vipa.com.vn/
- Institute of Intellectual Property Science, under the Ministry of Science and Technology,
  http://vipri.gov.vn/

23. *For more information, see Intellectual Properties Law (2005, 2009), Article 200.*

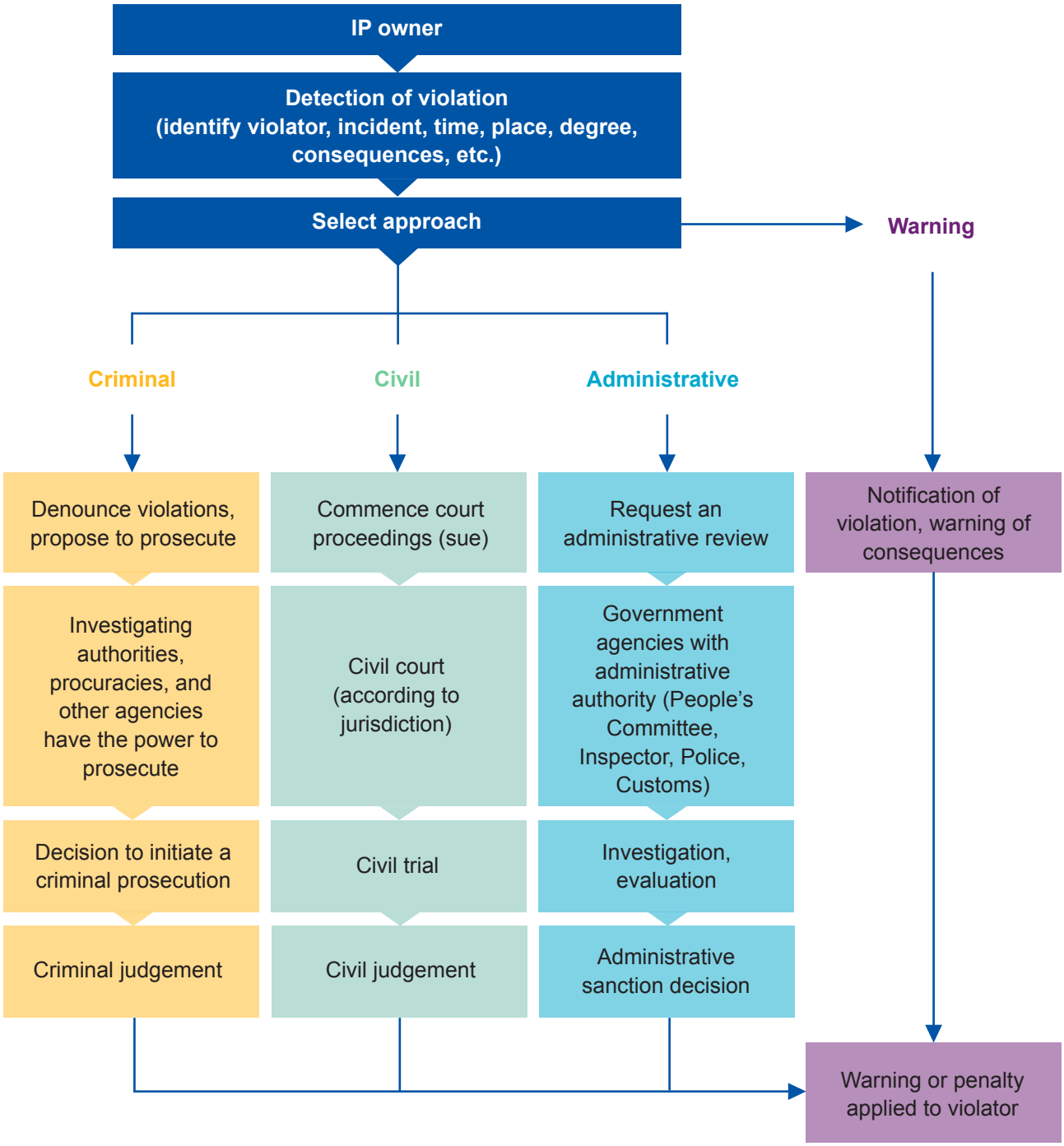


Figure 2.3. Official procedures to resolve dispute and infringement of IP rights

Transfer of Intellectual Property

The transfer of Intellectual Property (IP) is the mechanism by which an IP owner gives permission to another person or business to use their intellectual property within certain conditions, such as use for a limited timeframe, for a financial return, and within a certain territory. There are two types of technology transfer:

a) Transfer of Intellectual Property Rights:

When the owner of an IP asset sells the IP ownership to a recipient, the recipient then becomes the owner of the intellectual property.

A researcher should carefully consider the decision to transfer intellectual property rights. In general, this is not a recommended commercialisation solution because the original owner of the IP only benefits once, i.e. only at the time of selling the intellectual property, thus losing the ability to continue reaping the potential future financial benefits from that IP asset.

b) Transfer of the right to use the IP:

A transfer (or licensing) of the permission to use the IP by another means that the owner of the IP allows another organisation or individual to use the IP under a license agreement, with certain contractual conditions.

In general, there are three common types of license agreements:

i. **Exclusive license:** entitles the licensee to exclusively use the intellectual property within an agreed scope and terms of a contract, while restricting the licensor *(i.e. the IP owner)* from allowing others to use that IP with any third party. In addition the licensor may not use the IP without the licensee's permission.

ii. **Sole license:** is similar to the exclusive license above, but the licensor still has the right to use the intellectual property.

iii. **Non-exclusive license:** there are no limitations on the number of licensees. Under the scope and terms of the contract, the licensor has the right to enter into a contract allowing the use of the IP by one or more parties.

Importantly, under current Vietnamese law, the transfer of intellectual property must be made through a written contract and registered with the Intellectual Property Office of Viet Nam to be legally valid[24].

Researchers can seek advice and support services from the following agencies:

- Institute of Intellectual Property Science, under the Ministry of Science and Technology, http://vipri.gov.vn/
- National Institute of Patent and Technology Exploitation, under the Ministry of Science and Technology, https://niptech.vn
- Intellectual property agency network, http://www.noip.gov.vn/web/guest/-ai-dien-so-huu-cong-nghiep

24. *Term 47 Circular No. 01/2007/TT-BKHCN dated 14/02/2007 Amendment*

What are regulations for IP assets created from state funding *(i.e. Science & Technology projects funded by the state budget)*?

Currently, research results from Viet Nam's universities and research institutions are largely from science and technology projects that have been funded (fully or partly) from the state budget, or when the project receives the right to use state-owned facilities and infrastructure to implement the project. As a result, researchers must be aware of their obligations before commencing the Commercialisation PLUS process.

How to identify assets created from Science & Technology projects funded by the state budget?

State-funded projects can be at national, ministerial, provincial and community levels. The assets created from these projects include:

- Physical assets acquired to implement the project, and
- Intellectual Property assets, which are the results of the project.

Research results include inventions, solutions, technical know-how, trade secrets, innovations, design and layout of semiconductor integrated circuits, industrial designs, trademarks, trade names, plant varieties, computer programs, technical designs, scientific works and other objects, including protected and non-protected objects following the regulations of the intellectual property law.

What are the important legal regulations?

As a general rule, when a project receives more than 30% of its funding from the Vietnamese Government (hereafter called 'state-funded project'), before commercialisation begins it is mandatory to adhere to the following requirements:

- Regulations on management and use of public property
- Assessment and valuation/appraisal, and
- Assignment of rights and distribution of benefits.

Specifically, in the process of commercialisation, researchers need to pay attention to the following legal regulations:

- Regulations related to the management and use of public assets, including:
  - » Law on Management and use of public property, No. 15/2017/QH14, 2017
  - » Decree 70/2018/ND-CP, Regulations on management and use of assets formed through the implementation of Science & Technology projects using state budget
  - » Circular 02/2020/TT-BKHCN, Guide to implement Clause 1, Article 41 of the Decree No. 70/2018/ND-CP
- Regulations on assessment, valuation/appraisal of research results and intellectual property, including:
  - » Joint Circular No. 39/2014/TTLT-BKHCN-BTC: stipulating the valuation of scientific research and technological development results and intellectual property using the state budget
  - » Circular No. 31/2011/TT-BKHCN: guiding the function and operation of technology assessment and valuation organisations
  - » Circular No. 06/2014/TT-BTC of the Minister of Finance on promulgating Price Appraisal Standard No. 13 (Appraisal of intangible assets)
  - » Circular No. 10/2019/TT-BTC of the Ministry of Finance, guiding the determination of the value of assets resulting from state-funded projects for transferring ownership and right to use the assets

- Regulations on delegation of rights and distribution of benefits are contained in:
  - » Law on Science and Technology 2013 (Articles 41-43)
  - » Decree 08/2014/ND-CP guiding the Law on Science and Technology
  - » Circular No. 15/2014/TT-BKHCN stipulating the order and procedures for assigning ownership and right to use results of scientific research and technological development funded by the state budget (Replaced by Circular No. 15/2014/TT-BKHCN). April 2, 2020/TT-BKHCN)
  - » Circular 10/2019/TT-BTC of the Ministry of Finance, guiding the determination of the value of assets resulting from state-funded projects for transferring ownership and right to use the assets

To better understand the requirements for a state funded project, a practical example is provided in Table 2.1 of the legal process to be followed before commercialisation of results can begin.

Table 2.1 An example of the legal requirements to be followed before commercialising research results from a state funded project.

Content/Steps	Description	Note
1. Name of research results: Naturenz antidote for people with chronic chemical poisoning and decreased immunity	One of the products from the state-funded project *"Improving the technological process to produce three Naturenz products, Uphaton, Tien Dung, using Vietnamese herbs and vegetables to protect and improve health".*	Ministerial level project, which was completed and accepted. Project code KC.10/06-10
2. Funding	The project was fully funded from the state budget. The funding for the selected research result (Naturenz) is estimated and also fully funded from the state budget.	Project lead: VAST Institute of Biotechnology
3. Ownership and right to use research results	The results belong to the government *(i.e. the funding agency)*, via is the Ministry of Science & Technology in this case. The owner's representative is the Minister for Science & Technology. The Minister then authorised NATEC, as the representative, to supervise the commercialisation process.	These regulations are based on Article 10 and 12 of the Circular 15/2014/TT-BKHCN of Ministry of Science & Technology

Content/Steps	Description	Note
4. Assessment/valuation of research results	Valuation Report No. 433/ VĐG dated 7 December 2015, by the Institute for Science Evaluation and Technology Valuation (using a combination of the Cost and Income methods)	Based on Circular 10/2019/ TT-BTC of the Ministry of Finance, to be eligible for commercialisation, the valuated price of the research result must be equal or higher the funding from the state budget.
5. Authorisation to commercialise research results	Decision No. 1556/QD-BKHCN dated 14 June 2016 on partial transfer of ownership of research results for commercialisation to the lead institute.	Based on Decree 08/2014/ ND-CP of the government and Circular No. 15/2014/ TT-BKHCN of the Ministry of Science & Technology.
6. Distribution of profit from commercialisation	Based on the Transfer of Ownership Agreement signed between NATEC and VAST Institute of Biotechnology: • The author is entitled to 30% of the profit after tax • The representative of the state owner is entitled to 5%, and • The lead institute is entitled to the remaining amount (65%).	According to the proposal of the project lead institute (VAST Institute of Biotechnology) based on Article 42 of Decree 08/2014/ ND-CP of the government.

To complete the legal process, researchers can seek advice and support from the following agencies:

- National Agency for Technological Entrepreneurship and Commercialisation Development, under the Ministry of Science and Technology, https://natec.gov.vn
- Viet Nam Centre for Science and Technology Evaluation, under the Ministry of Science and Technology, http://vistec.gov.vn
- Department of Public Asset Management, under the Ministry of Finance, https://taisancong.vn/tsc/faces/fm/f_trangchu
- Department of Price Management, under the Ministry of Finance, https://www.mof.gov.vn/webcenter/portal/cqlg/r/h/link_home

What is "Technology Transfer"?

The Commercialisation PLUS process is also underpinned by the concept of technology transfer. For the purposes of this guide, technology transfer can be described as the movement of your technology solution (including solutions, processes, know-how knowledge (with or without tools), and the means used to transform resources into products, etc.) from one organisation to another, based on financial transactions.

Technology transfer is an important process in the context of globalisation. No single country in the world has all the resources to create all of the needed technology in an economic and efficient capacity. Therefore, countries often consider importing technology or developing it through research to meet the need for innovation for economic and social development.

What is Technology Transfer?

In 2001, the United Nations Conference on Trade and Development (UNCTAD) described technology transfer as the systematic transfer of the knowledge required to successfully and consistently create and deliver a product, apply a process, or perform a service[25].

Regulations governing technology transfer

The 2017 Law on Technology Transfer in Viet Nam states that the *"transfer of technology ownership or the transfer of the right to use technology from the party having the right to transfer the technology to the technology transferee"*.

The regulations governing the objects for technology transfers are broadly grouped into three categories:

1) The transferred technology can be one or more objects, including technical know-how, technological know-how[26] or technological plans and processes; solutions, parameters, drawings, and technical diagrams; formulas, computer software, and data information; solutions to optimise production, innovated technology; machinery and equipment accompanying one of the above-mentioned objects.

2) If the technological object specified above has been protected by intellectual property rights, the transfer of intellectual property rights shall comply with Law of intellectual property.

For technologies that have not yet been protected by intellectual property rights, the transfer, purchase and sale shall be carried out in accordance with the Law on Technology Transfer and other laws (e.g. Law on Public Investment, Law on Science and Technology, Law on Prices, Law on Commerce, Civil Code, Law on Foreign Trade Management, etc.), together with the relevant Decrees, Circulars and guiding documents.

3) Technologies that are encouraged to transfer, technologies that are restricted from transferring, and technologies that are banned from transfer are specified in the Law on Technology Transfer[27], specifically:

- Article 9: List of 143 technologies encouraged to transfer,
- Article 10: List of technologies restricted from transferring, including 34 technologies transferred from abroad to Viet Nam and within Viet Nam, six technologies transferred from Viet Nam to foreign countries,
- Article 11: List of technologies banned from transferring, including 48 technologies transferred from abroad to Viet Nam and within Viet Nam, two technologies transferred from Viet Nam to foreign countries.

25. Source: *https://unctad.org/system/files/official-document/psiteiitd28.en.pdf*
26. *Know-how can be described as information or knowledge accumulated and discovered in the process of research, production, and business, which determine the quality and competitiveness of technology and technological products.*
27. See the provisions in *Article 3, Decree 76/2018/ND-CP detailing and guiding the implementation of the Law on Technology Transfer.*

Key features of technology transfer

The process of technology transfer involves many components. The six key features of this approach are listed below and highlight a range of examples (not exhaustive) for each category.

a) ***Levels of Technology Transfer*:**
Technology transfer is made through different levels as follows:

- **Knowledge transfer:**
  The transfer of knowledge is made through advice, guidance, coaching, consulting, and/or training. The risk associated with this level is "low" for both transferee and transferer.
- **Technology:**
  The owner only transfers the technology to the transferee. The level of risk associated with this level is "high" for the transferee. The technology may not keep performing consistently as the transferee intended, e.g. not delivering products to the same standard as originally produced. On the other hand, there is also a reputational risk to the owner if unintended uses of the technology by the transferee have negative impacts.
- **Product:**
  The transfer of the technology is with an assurance of an agreed product. Compared to the "Technology" level, the risk is lower for the transferee because the transfer agreement defines and assures the products created by the technology.
- **Market:**
  The technology transfer is for a wide range of manufactured products made for an available market. The risk for this level is "low" for the transferee because both products and markets are assured.

b) Forms of technology transfer:

- Independent technology transfer.
- Technology transfer in the following cases: investment projects; capital contribution with technology; franchising; transfer of intellectual property rights; purchase and sale of machinery and equipment (as specified at Point d, Clause 1, Article 4 of the Law on Technology Transfer).
- Transfer of technology in other forms as prescribed by the Law of Technology Transfer.

c) Methods of technology transfer:

- Transfering technology documents.
- Training the transferee to master the technology.
- Appointing technical consultants who will guide the transferee to operate the technology to achieve the expected product quality and meet production targets.
- Transfering machinery and equipment with technology (as specified at Point d, Clause 1, Article 4 of the Law on Technology Transfer).

d) Payment methods: may include a one-time or multiple payments in money or goods; a transfer of the value of the technology into capital that contributes to investment projects or business capital; paid as a percentage (%) of the net selling price; paid as a percentage (%) of net sales; paid as a percentage (%) of pre-tax profit.

e) Technology transfer contract: The technology transfer contract must be made in writing (or in other forms to be considered as a written contract) according to the provisions of the Civil Code. The contract is entered into and performed in accordance with the Law on Technology Transfer, the Civil Code, the Commercial Law, the Law on Intellectual Property, the Law on Competition and other relevant laws, as specified at Articles 22 to Article 34, Chapter III, Law on Technology Transfer).

f) Scope of technology transfer (to be agreed by the parties):

- Exclusive or non-exclusive use of technology
- Transferable or not transferable to a third party
- Scope of technology use
- The right to improve technology, the right to receive information about technology improvement
- Exclusive or non-exclusive distribution of goods produced by the technology
- The geographical areas to sell the products made by the technology

To assist in the technology transfer process, researchers can seek support, advice, and services from the following organisations:

- Science and Technology Enterprise and Market Development Department, under the Ministry of Science and Technology,
  https://natec.gov.vn/
- Department of Technology Application and Development, Ministry of Science and Technology,
  http://www.sati.gov.vn/

What are the market regulations you need to consider?

In addition to the aforementioned foundational laws that govern the Commercialisation PLUS process, before any individual technology solutions are launched into the market, they need to comply with additional market regulations that govern what is, and is not, allowed in the marketplace for different industries in Viet Nam.

As an example, to transfer to market the value-adding technology that creates jam and wine from dragon fruit, the following market regulations relating to food safety needed to be complied with:

- Food Safety Law 2010,
- Decree 15/2018/ND-CP, and
- Decree 105/2017/ND-CP on wine production.

Another example, from the fields of pharmaceuticals and agrochemicals (agricultural), researchers need to pay attention to a special type of intellectual property, namely experimental data. Under current Vietnamese law, test data is not a separate object of intellectual property rights, but can be protected as a trade secret or under the contents of an invention.

Following the regulations[28], for pharmaceuticals and agrochemicals to be legally sold in the market, researchers need to request permits from the relevant authorities, such as:

- Drug Administration under the Ministry of Health, https://dav.gov.vn/dang-ki-thuoc-cong-bo-nguyen-lieu-c311.html, and
- Plant Protection Department under the Ministry of Agriculture and Rural Development, https://www.ppd.gov.vn/thuoc-bao-ve-thuc-vat-67.html.

Understanding the specific regulatory obligations relevant to your technology solution will help inform the market requirements that need to be addressed. These requirements include but ***not*** limited to costs, timing to launch the product or service into the market, and the ability to legally sell certain products or services. If these obligations are not considered, regulatory hurdles can be expensive barriers for your technology to be adopted and, ultimately, delay achieving the desired impact. Therefore, depending on the technology solution to be commercialised, you may need to consider numerous regulations and engage with multiple regulatory authorities at the same time.

Apart from complying with the regulations of Viet Nam, when you wish to bring your technology or product to a global market, you must also consider the relevant international regulations. Furthermore, it is also important to know if your customers/clients are considering exporting or selling your products to international companies, as many countries have their own standards, rules and compliance mechanisms.

28. *Circular 05/2010/TT-BYT*, dated 01/3/2010.

Special focus

What are the legal and regulatory considerations and obligations that guide a Commercialisation PLUS journey?

The Government of Viet Nam has established a systematic set of laws and regulations to guide the transfer of technology from research to market. These laws and regulations are in line with the prevailing international treaties. The Commercialisation PLUS process recognises all relevant laws and regulations both domestically in Viet Nam and internationally.

To date, Viet Nam has established a system of laws and regulations to facilitate the commercialisation of research results. In particular, three Vietnamese laws provide the overarching framework for relevant laws and regulations (see the table below). Supporting these laws are several decrees and circulars, which provide more tailored guidance around specific aspects of the three laws.

All laws and regulations can be found at https://thuvienphapluat.vn

Law No. 91/2015/ QH13	Civil Code Law	• Stipulates legal status and legal standards for the conduct of individuals, legal entities, and other subjects; rights and obligations of subjects regarding personal identities and property in civil, marriage and family, business, commercial and labour relations (hereinafter referred to as civil relations). • Protects the legitimate rights and interests of individuals and organisations, the interests of the State and the public interests; ensures equality and legal safety in civil relations, contributes to creating conditions to meet the people's material and spiritual needs, and promote socio-economic development. • Part 6 "IP and technology transfer rights" defines general principles in civil relations, considering intellectual property rights as a type of civil right and protected according to the principle of civil rights protection.
Law No. 50/2005/ QH11 and Law No. 36/2009/ QH12	Intellectual Property Law	Provides regulations for: • Copyrights, and copyright-related rights (performances, video recordings, broadcasts, satellite signals carrying encrypted programs), • Industrial property rights (inventions, industrial designs, layout designs of semiconductor integrated circuits, trademarks, trade names, geographical indications), • Rights to plant varieties (propagating and harvesting materials), and • The protection of such rights.
Law No. 07/2017/ QH14	Law on Technology Transfer	Provides regulations for: • Technology transfer activities within Viet Nam, from abroad into Viet Nam, and from Viet Nam to abroad, • Rights and obligations of organisations and individuals participating in technology transfer activities, • Technology appraisal of investment projects, • Technology transfer contracts, • Measures to encourage technology transfer and develop a science and technology market, • State management of technology transfer.

Law No. 29/2013/QH13	Science and Technology Law	This Law provides regulations for organisations and individuals engaged in scientific and technological activities, including the organisation and implementation of scientific and technological activities, measures to ensure scientific and technological development, and state management of science and technology. Section 5 (Articles 41-43): Ownership and copyright of scientific research and technological development results, including: • Article 41. Ownership and right to use scientific research and technological development results. • Article 42. Copyright in scientific research and technological development results. • Article 43. Profit-sharing when using, transferring the right to use, transferring, and contributing capital with results of scientific research and technological development funded by the state budget.
Law No. 07/2017/QH14	Law on Technology Transfer	• http://www.noip.gov.vn/vi_VN/web/guest/van-ban-phap-luat-quy-che • https://www.most.gov.vn/vn/Pages/VBPQ.aspx?Machuyende=VB&ChudeID=73 • http://vbpl.vn/pages/portal.aspx • https://phapdien.moj.gov.vn/Pages/chi-tiet-bo-phap-dien.aspx • https://wipolex.wipo.int/en/main/legislation (international).

Part Six of the 2005/2015 Civil Code Law defines intellectual property rights as a civil right, while the 2005/2009/2019 Intellectual Property Law formalises the above principles and complements other aspects (economic, commercial, administrative, etc.). In addition to these two laws, there are also specialised laws, such as trade, customs, health, science-technology, which form part of the legal system that govern the Commercialisation PLUS process.

Moreover, commercialisation of research results is also governed by other laws, such as: Law on Public Investment, Law on Management and Use of Public Property, Law on Pricing, Law on Commerce, Code of Civil Procedure, Law on Foreign Trade Management, Law on Quality of Products and Goods, etc.).

Apart from the aforementioned national legal documents, the protection of intellectual property in Viet Nam is also based on international treaties that Viet Nam has ratified (reflected in the above legal regulations), such as the Paris Convention (1883, 1967) on the protection of industrial property, the Berne Convention (1886, 1971) on the protection of literary and artistic works, and the Agreement on Trade-Related Aspects of Intellectual property rights (TRIPS Agreement) of the World Trade Organisation (WTO). The above documents establish a legal basis for activities related to IP and the protection of intellectual property for Vietnamese researchers.

Special focus

Freedom to operate and third parties' rights

A Freedom to Operate (FTO) search is an important part of your due diligence for your Commercialisation PLUS process. It helps you determine if the intellectual property within your technology solution is free to commercialise. The results of this search aim to reduce the possibility of legal action against you, if you infringe upon existing IP rights that are owned by someone else. Other common names for this search is a patent infringement search or a right-to-use search.

A Freedom to Operate search is designed to uncover any existing, thus enforceable, patents that may act as roadblocks to your Commercialisation PLUS process.

This search determines the possibility that you might infringe upon existing intellectual property by identifying any similar intellectual property found in your technology solution. The results will have implications for the commercialisation opportunities of your technology solution.

While the ideal outcome from a Freedom to Operate search is "no infringement found", if infringements are found, then the most common options for response include:

- abandoning the commercialisation process for the technology solution,
- engaging in a redesign to bypass the intellectual property that is being infringed upon, or
- approaching the patent holder for possible licensing negotiations.

Conducting a Freedom to Operate search before you execute your Commercialisation PLUS strategy *(i.e. during your planning phase)* is an important way of minimising the risk of a patent infringing upon the patents owned by others.

It is recommended that a patent attorney be commissioned to undertake your Freedom to Operate search. A Freedom to Operate search can involve reviewing and assessing hundreds to thousands of documents and patent attorneys have the most appropriate expertise to interpret the results of this search and provide assurance, or not, about any potential infringements. If there is a potential infringement, they are also the best person to provide advice on what this means and any strategies that can resolve it.

Investing in comprehensive patent searches, like Freedom to Operate searches can uncover important insights that helps increase the value of your technology solution to potential customers/clients.

For more information on how Freedom to Operate can influence your path to market, refer to the following two scenarios.

Scenario 1

Imagine that you have invented a unique technology, in this example it is a special type of domestic waste collection machine which automatically sorts household waste into metal, paper, plastic etc., and packages it for recycling.

You immediately see an international market for this technology. However, you are also aware that eTrash PLC has patents for an identical technology.

As part of your commercialisation planning process for this invention, you undertake an Freedom to Operate search.

Unfortunately, you find that eTrash PLC has valid patents for the invention in all European countries and the USA, but nowhere else. By elimination, you see that you have FTO in other countries such as Australia, Canada, South America and even Asia.

Consequently, you could consider establishing production, sales and distribution in those countries because eTrash PLC does not have any patents there. However, you must also make sure that no other companies have patent rights for your product in these countries!

If the biggest markets for you are actually Europe and the USA, your FTO search must also be directed at identifying when eTrash's patents will expire (or have expired). This can be complicated as a patent may appear to be invalid (because of failure to pay fees) but can be reinstated later, in which case if you have prematurely moved into the market, you could face fines or other penalties.

In principle, patents have a maximum finite life, but in some cases the patent term can be extended. Again, if you've moved too soon bring your product to market you could be held liable[29].

Scenario 2

Imagine that you have patented your intellectual property, a device which automatically compensates for eccentric loads in rotating machinery. Examples could include a washing machine or spin drier with a heavy wet bed cover inside, or a food mixer with solid and liquid ingredients in its bowl, or a vehicle tyre and wheel which need to be balanced.

Your device is an improvement to existing inventions, yet your device is essentially useless on its own. You cannot unilaterally embed your device into food mixers, washing machines and spin driers made by other companies if protected by patents. Therefore, you do not have Freedom to Operate. You will have to come to some sort of cross-licensing agreement, based on the respective patent ownerships.

These more complicated situations occur when the implementation of the invention depends on another[30].

29 & 30. Source: Clarke, N. (2018) *The basics of patent searching. World Patent Information Vol 54 Supplement September 2018 pages S4-S10*. DOI: *https://www.sciencedirect.com/science/article/pii/S017221901630103X?via%3Dihub*

Chapter three

A step-by-step guide to the Commercialisation PLUS process

Introduction

This chapter explains the purpose of, and provides guidance for, the nine steps in the Commercialisation PLUS process, including when and how to implement them. Specifically, it includes guidance questions, tips, links to tools, as well as case studies. Each section is designed to help you understand the intention of each step, the necessary preconditions, how to implement the step, as well as indicating the decisions to be made and who to access for help to complete the step.

The Commercialisation PLUS process is underpinned by commercialisation and innovation systems methodologies and concepts. The process is comprised of three phases and nine key steps. These steps have been grouped into logical phases for decision-making however the Commercialisation PLUS process is non-linear. It is not uncommon for Commercialisation PLUS practitioners to complete some steps **simultaneously or even repeat some steps if information or circumstances change over time**.

The process is therefore flexible, and the order of the steps can be selected depending on time and availability of the different stakeholders along the process. This allows for the optimisation of innovation, market, and impact potential. In each phase, and its associated steps, commercialisation practitioners are required to collect and analyse different information and evidence to inform actions in subsequent steps.

It is important to note that Commercialisation PLUS is an iterative and adaptive process. It builds on formal and informal interactions between the different actors in the innovation ecosystem, namely researchers, private sector, and government. This means that the path to market for various technology products and solutions is likely to differ and may not follow the same timeline. This variability has been accounted for within the guidelines and practical tools provided.

An integrated approach to commercialisation

The Commercialisation PLUS process has been depicted as a puzzle to emphasise that each step is essential, however just like a puzzle the steps can be completed in different orders to achieve the desired result –yet every step is eventually completed.

PHASE A

Building your commercialisation foundation through market discovery *(i.e. proving the commercial potential of your solutions)*

PHASE B

Defining your value and planning your maket strategy *(i.e. planning to launch your technology solution in the market)*

PHASE C

Implementing & managing your strategy for impact *(i.e. launching your technology solution into the market and managing for impact & scale)*

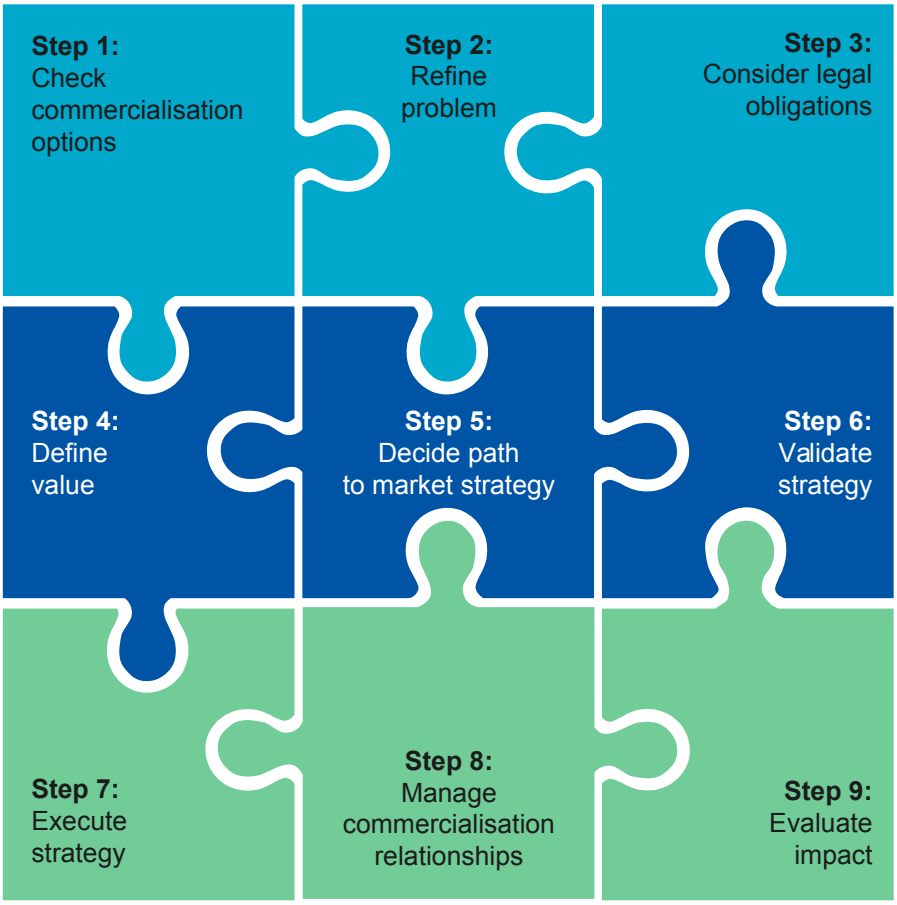


Figure 3.1: Steps in the Commercialisation PLUS process

The aim of each piece of the puzzle (or step) is to test and validate assumptions in order to reduce risk and to assist in making evidence-based decisions. As you work through the steps of the Commercialisation PLUS process, you will take your assumptions about the commercialisation process and its actors and find evidence to support or disprove these assumptions. Consequently, there may be times where you are required to return to completed steps to test new or previously unrecognised assumptions.

Each step is also designed to help researchers understand the different actors in the system *(e.g. the customer and the end users)*. This enables researchers to make informed decisions about those with whom to engage and partner, as well as understanding the most appropriate pathway for creating value and impact.

Before you begin

Please note that this guide does not teach you how to develop novel research or provide you with the theory of behind commercialisation practices. The guidance provided is purposefully broad and highly practical to ensure that the content is applicable to as many forms of technology solutions as possible.

As a researcher in your field of expertise, you will be best placed to understand the unique aspects of your own research project, however this does not inherently translate to value in the marketplace, without wider considerations. Therefore, this guide focuses on collecting and analysing information that you will need to help you make decisions about how to transfer your technology solution out of the lab and into the market. The guide is designed to be complementary to the technical research and development for your technology solution and the legal intellectual property protection processes, which run both in parallel and interconnect with each other (see Figure 3.2).

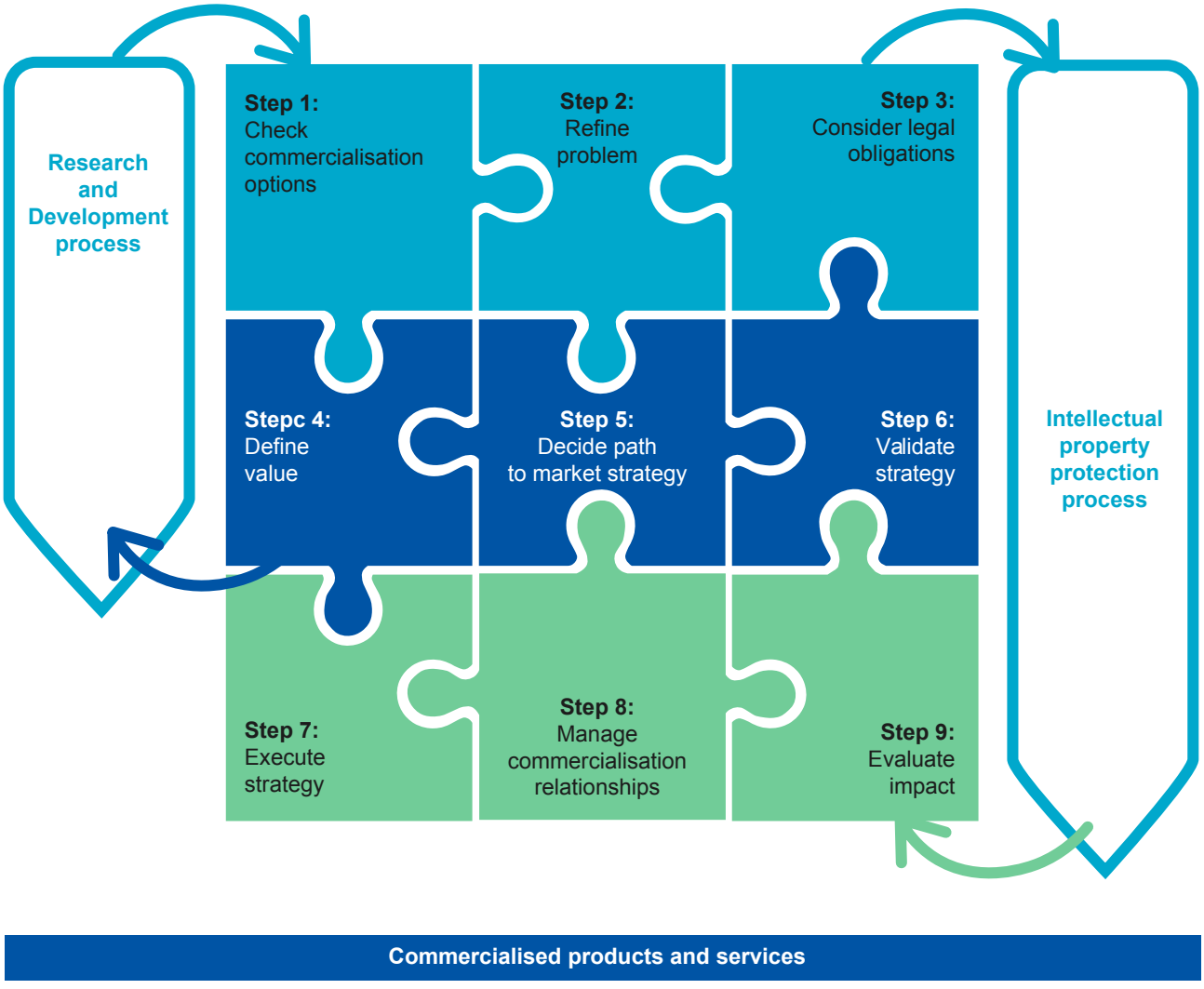


Figure 3.2: Overview of the relationship between Commercialisation PLUS, Research & Development, and Intellectual Property Protection

Assessing your Commercialisation PLUS Readiness

The Commercialisation PLUS Readiness Assessment has been developed to help you a) understand where to start, b) navigate through the Commercialisation PLUS process, and c) identify the next key steps to take depending on your own personal context. The Commercialisation PLUS process supports the strategic management of your Commercialisation PLUS journey, and it provides tools for enhanced planning and capability development to ensure beneficial social, environmental, and economic impacts.

You can undertake a Commercialisation PLUS Readiness Assessment at the start, or during any step, of your Commercialisation PLUS journey. The questionnaire assesses the status, or the readiness, of your technology solution against six essential categories that underpin successful and impactful science commercialisation. The six categories are referred to as the "*Readiness Capabilities*" (see Figure 3.3).

Figure 3.3: Commercialisation PLUS Readiness capability categories

Each Readiness Capability category contains questions that connect to one or more steps in the Commercialisation PLUS process. By answering the questions in the Commercialisation PLUS Readiness Assessment, you can understand your progress and determine the next best actions to undertake when transferring your technology from the laboratory and launching it in the market.

The questions in each Readiness Capability category will also lead you to additional guidance around any points of potential weakness, or areas of high risk due to the need for additional information. It is important to note that the self-assessment questionnaire is not intended to be an indicator of success, yet an indicator of progress along the Commercialisation PLUS journey and also to highlight potential knowledge gaps.

Each category in the Readiness Capability framework is supported by a number of resources and tools which can be found at the web addresses located in each step.

Clearly understanding where you are along the commercialisation journey will help you, as well as other researchers, managers and mentors, to identify and to manage the knowledge gaps, risks and system challenges that need to be addressed and overcome to successfully launch a technology product or service into the market.

Note

The Commercialisation Readiness Assessment is a questionnaire designed to align with current best practice and well-known methodologies and practices in commercialisation and innovation development. These include (but are not limited to): Technology Readiness Levels, Business Model Canvas, KTH Innovation Readiness Level™, Investment Readiness Levels, Concept Insight Matrix, etc. The guide and its tools have also been tested with Vietnamese Agriculture and Food technology products and services to ensure appropriateness and effectiveness within Viet Nam's Innovation System.

Go to the Commercialisation PLUS Readiness Assessment:

https://commercialisationplus.org/create-account/

(Nb. You will need to create a personal account to sign in)

Phase A: Building your commercialisation foundation through market discovery

Proving the commercial potential of your solutions

Each phase and step in the commercialisation process require research teams to apply different capabilities to make decisions and navigate through the commercialisation process.

You will be guided through these decisions by the Commercialisation PLUS Readiness Assessment and supporting tools. The aim of these tools is to help you collect information to make informed decisions. Refer to Figure 3.4 to see to see the relevant capability categories for Phase A.

Phase A is about discovering the important foundational knowledge required for the Commercialisation PLUS process by validating your market knowledge. This phase will also help you make decisions around risk, target markets, regulatory obligations, confidentiality, and the intellectual property protection needs for you and potential clients.

To address key areas of Phase A you will be asked to gather evidence around questions such as:

- What possible impact or change in society, the environment, or the economy could your technology solution achieve?
- Has the market reported a problem that your knowledge and/or technology solution could help with?
- What are the possible market options for your technology *(i.e. are there customers for the product? Are there people who can make it? Are there competitors with similar technology solutions? etc.)*?
- What are the regulations that guide the types and quality of products sold in a particular market and does your technology solution comply?
- Does your technology solution have any novel concepts or ideas that may need protecting *(i.e. Intellectual Property (IP))*?
- Does your technology solution use other people's Intellectual Property (IP)? Do you have the appropriate permissions to use this intellectual property *(i.e. are you infringing on other people's Intellectual Property or do you have freedom to operate)*?

The steps in this discovery phase will help you understand opportunities for how your expertise and technology solution(s) can meet the needs of the market.

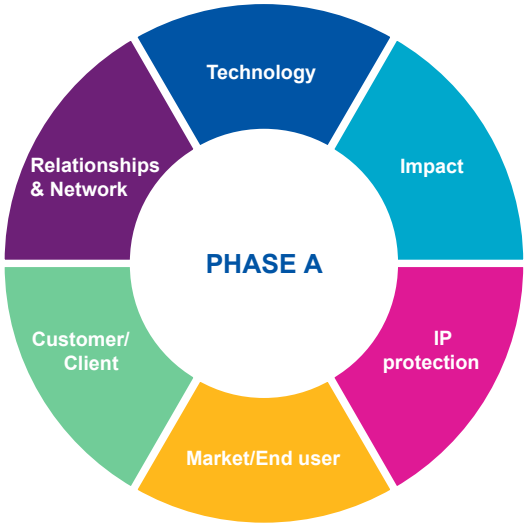
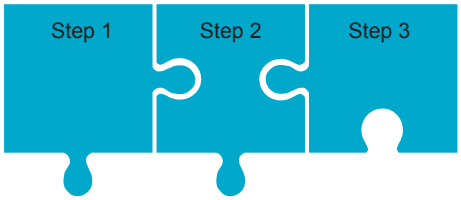


Figure 3.4: The Readiness Capability categories applicable in Phase A

The steps in this phase include:



Step 1:
Checking your commercialisation options

Step 2:
Refining your understanding of the market problems that your solution is addressing

Step 3:
Considering your legal and regulatory obligations to protect your IP and legally launch in the market

Step 1:
Checking the Commercialisation PLUS options for your technology solution

Objectives of Step 1

This first step is about verifying if there are any restrictions or limitations that could impact your ability to commercialise your technology solution.

Step 1 aims to help you understand:

a) If your technology solution is at a stage that you can start considering and incorporating the needs and priorities of the market into the research and development process.

b) If similar ideas have already been disclosed to the public, and

c) If your research funding permits commercialisation.

At the end of this step you should be confident that…

1) The concept of your technology solution has taken into account the needs of the market, e.g. industry and government stakeholders, and it responds to these identified needs.

2) The funding source for your research permits commercialisation, *i.e. allows you to earn revenue from your research.*

3) You are sure that the intellectual property underpinning your technology solution has or has not already been publicly disclosed.

At a minimum, understanding these three foundational points will help you make an informed decision about whether you should attempt to commercialise your technology solution or not, and what potential intellectual property (IP) constraints may influence your commercialisation options.

What I need to do in Step 1

The following guidance is based on the Commercialisation PLUS Readiness Capability categories. The suggested actions are dependent on the results of your Commercialisation PLUS readiness assessment.

Figure 3.5 highlights the capability categories which indicate the knowledge, skills and experience required to complete Step 1. Each capability category is described in more detail below.

Note:
Not all steps require actions from each of the six readiness capability categories. Different steps require different capabilities.

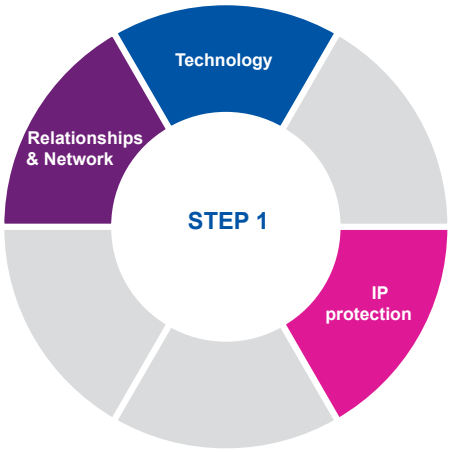


Figure 3.5: The Readiness Capability categories applicable in Step 1

Technology Readiness

It is important that your research is developed to a point that it delivers consistent and repeatable results from experiments *(i.e. Proof of Concept)*. A key indicator of the readiness of your technology for translation into the market is if you can consistently guarantee your results to potential customers and end users.

Therefore, for this step you need to know how to assess whether your technology is sufficiently developed for you to transition your focus from technical/scientific research to commercial/market-orientated research.

It is important to understand whether your technology solution has reached a level of development that makes starting a Commercialisation PLUS process viable. This is critical as this particular process also lays the foundation for effective engagement with potential collaborators, beneficiaries and clients.

It does not mean, however, that your technology, at this stage, is necessarily developed enough for the market; it is expected that the technology development process will continue in parallel to the Commercialisation PLUS process (see Figure 3.2). In fact, it is expected that the information collected, as well as the decisions made, during your Commercialisation PLUS journey will inform the development of your technology solution to ensure that it aligns with market needs.

Note from practice

International best practice suggests that the most effective commercialisation outcomes are gained when researchers have shifted their focus from thinking about technical aspects of the technology solution to researching or investigating the market and testing assumptions that they may have had about the usefulness of their solution.

Readiness check	Actions
Has your technology solution been proven in the research environment? ○ **Yes** ○ **No** ○ **Unsure**	**If Yes** Proceed to the next question. **If No** Continue with research and reassess in the future. **Your solution is not yet ready for commercialisation**. **If Unsure** Go to the supporting tool to check if development of your technology solution has reached the minimum level you need to consider commercialisation as an option: **Technology Readiness for Commercialisation check** *https://commercialisationplus.org/resources/tools/1a/*

IP Protection Readiness

Intellectual Property (IP) protection can be understood as the various actions taken to ensure that once suitable IP reaches the marketplace, there is an optimal financial return to the research institute or university. Intellectual Property (IP) exploitation will generally involve activities such as licensing, the formation of a company, or other methods for technology transfer.

A key foundation of the Commercialisation PLUS process is therefore the exploitation of new or novel intellectual property that underpins your technology solution. Exploring what has and has not been disclosed to the public is an important basis to help you decide whether commercialisation is an option for your technology solution.

For this step you therefore need to know how to undertake an initial assessment regarding if there is an opening or gap in the intellectual property landscape for your idea. This includes any idea that has been shared publicly, in any way, including ideas shared through IP registration, journal articles, commercial products, conference papers, presentations and posters, blogs, etc. The aim is to determine if there are any existing solutions and/or potential competitors within the field of your technology solution.

It is important to know that your idea is novel and does not exist nor has it been disclosed previously by other people. You also need to start to understand who may be your competitors and which industries and companies might be interested in your technology.

Readiness check	Actions
Have you checked what information has been publicly disclosed about similar ideas/products in your home country and those around the world? ◯ **Yes** ◯ **No** ◯ **Unsure**	Go! **If Yes** Proceed to the next question. Wait! **If No or Unsure** Go to the supporting tool for advice on how to undertake a preliminary search to identify related publicly disclosed information: **Guide to 'State of the Art' searching** *https://commercialisationplus.org/resources/tools/1b/* Or go directly to your Intellectual Property Office (IPO) to commission a State-of-the-Art search.

Relationships & Network Readiness

Many research projects are catalysed or guided by a grant, donation or an equivalent funding source. In some instances, these funding sources can have conditions around the use of the final result. If your technology solution has been developed using this type of funding, it is important to ensure that you are familiar with the relevant terms and conditions in your funding agreement.

Typically, you will be looking for clauses in your contract that are related to sharing the Intellectual Property and/or use of the final result. If you have read your agreement and you are still unsure, first discuss your ambitions to commercialise your research results with your funder to gain clarity and to understand if they agree, or not, to this path to impact.

Readiness check	Actions
Have you checked if the funding for your research gives you the permission to commercialise your research outputs *(i.e. earn revenue from your research)***?** ○ **Yes** ○ **No** ○ **Unsure**	 **If Yes** Proceed to the next question.  **If No or Unsure** Firstly, refer to your funding agreement to understand if there are any potential restrictions on what you can or cannot do with your research results. Then, if you cannot obtain a clear understanding around what is permitted or not permitted from reading the agreement, discuss your commercialisation ambitions with your funder to ensure that the commercialisation of your technology solution is permitted.

A Snapshot from Commercialisation PLUS practice

Viet Nam Academy of Science and Technology:
Helping to reduce oil pollution in aquaculture farms

This biotechnology solution removes crude oil pollution from water and soil using microorganisms that are delivered on the husk of biochar.

Dr Le Thi Nhi Cong explains why they decided to commercialise their technology solution and how they managed any constraints from the funder in pursing commercialisation as an option.

To hear more from the researcher go to:
https://commercialisationplus.org/resources/video-library/

Thanks to:

Dr Le Thi Nhi Cong
Head of Environmental Biotechnology Lab,
Institute of Biotechnology Viet Nam Academy of Science and Technology

http://ibt.ac.vn/

Step 2:
Refining your understanding of the market problems that your solution is addressing

Objectives of Step 2

Step 2 aims to help you check your assumptions about the market and understand:

a) The market and the value chain that your technology will benefit from,

b) Who in the value chain will benefit and/or be adversely affected, i.e. potential end users/beneficiaries or customers/clients,

c) The potential impact of your technology (triple bottom line), i.e. the challenges, opportunities and benefits to society, the environment and the economy that your technology solution could contribute, and

d) The challenges faced by the end user and customer.

For most researchers, their effort has been focussed upon the technical aspects of the technology solution to optimise and refine the concept, e.g. functionality and reliability. Step 2 is about switching this focus towards testing various assumptions about why the market would be interested in your technology solution. This step will also help refine your understanding about the problem from the perspectives of other stakeholders. Ultimately, this step aims to challenge your assumptions and convert these to facts by gathering evidence about the value chain and the different actors that your technology is intended to benefit.

At the end of this step you should be confident that…

1) Your technology is potentially useful for industry and society.
2) You have identified potential impact areas across the environment, economy and society *(i.e. triple bottom line).*
3) You have assessed your market potential, i.e. you have identified the trends and competitors that can potentially influence your target market (both quantitative and qualitative).
4) You know where, and which actors, in the value chain that your technology will potentially add value.
5) Your network includes potential customers, you have identified end users in the value chain, and you are also building relationships with these groups of actors.
6) You have identified potential end users and customers to buy your technology solution.
7) You know how your solution will benefit or add value to possible customers and end users.

What I need to do in Step 2

The following guidance is based on the Commercialisation PLUS Readiness Capability categories. The following suggested actions are dependent on the results of your Commercialisation PLUS readiness assessment.

Figure 3.6 highlights the capability categories which indicate the knowledge, skills and experience required to complete Step 2. Each capability category is described in more detail below.

Note:
Not all steps require actions from each of the six readiness capability categories. Different steps require different capabilities.

Figure 3.6: The Readiness Capability categories applicable in Step 2

Market/End user Readiness

The market system in which your technology solution will be launched is dynamic and often complex. It can have a number of different actors fulfilling different roles and responsibilities along a value chain[31]. Therefore, an important foundation for anyone undertaking a commercialisation process is to understand which factors could potentially influence the ultimate adoption and use of your technology solution/s, including the different actors between you *(i.e. the technology solution provider) and the potential end user.*

Understanding these factors will help you and your team constructively engage with the different actors, build relationships and discover what challenges they face, understand the priorities they have, and ultimately identify opportunities for your technology solution to improve the practices of these key actors. Therefore, the *Market/End user Readiness* questions for this step are about helping you understand the factors that will influence people to use (or not use) your technology.

Readiness check	Actions
Have you identified which sectors your technology solution could benefit? ○ **Yes** ○ **No** ○ **Unsure**	 **If Yes** Proceed to the next question.  **If No or Unsure** Go to the supporting tool to help you identify the potential industries your technology could benefit: **Part A of the Market Discovery Guide** *https://commercialisationplus.org/resources/tools/2a/a/*

31. *A value chain is used to describe all the activities it takes to create a product from start to finish (e.g. design, production, distribution, and who the actors are along that chain etc.).*

Readiness check	Actions
Have you mapped the value chain for at least one of the sectors identified as a target market for your technology solution to help you understand how your technology solution will reach the market? ◯ **Yes** ◯ **No** ◯ **Unsure** *Note:* *A value chain describes all the activities it takes to create a product from start to finish (e.g. design, production, distribution, etc.). It provides a visual model of these activities, as well as the actors involved in the value chain.*	 **If Yes** Proceed to the next question.  **If No or Unsure** Go to the supporting tool to identify the key individuals and businesses who are involved in the different activities along the value chain: **Part B of the Market Discovery Guide** *https://commercialisationplus.org/resources/tools/2a/b/*
Do you understand how your technology solution can benefit end users? *(i.e. How can your technology solution help end users address problems or take advantage of opportunities to improve their business, life, etc?)* ◯ **Yes** ◯ **No** ◯ **Unsure**	 **If Yes** Proceed to the next question.  **If No or Unsure** Go to the supporting tool to help you identify all of the contacts with which your research team is connected across the value chain (both professional and private networks): **Part D of the Market Discovery Guide** *https://commercialisationplus.org/resources/tools/2a/d/*

Impact Readiness

Commercialisation PLUS is about benefits that are broader than simply generating revenue from a technology solution. It is about how your technology solution can contribute to the sustainable development of Viet Nam.

This means that early in the commercialisation process, it is important to understand the potential or desired impacts of your technology. It is equally important to recognise how your technology solution can contribute to the environment, society and economy if adopted and sold in the market or by the relevant value chain actor/s. Therefore, the questions for this step are about helping you identify the potential impacts and benefits from your technology solution across the triple bottom line (Figure 1.0) and the groups who will benefit.

Readiness check	Actions
Do you know who is likely to benefit from using your technology solution? ○ Yes ○ No ○ Unsure	Go! **If Yes** Proceed to the next question. Wait! **If No or Unsure** Go to the supporting tool to help you identify who are the ultimate end users who would benefit from your technology solution: **Part B of the Market Discovery Guide** *https://commercialisationplus.org/resources/tools/2a/b/*
Do you know how your technology solution could contribute to positive or negative changes to the environment, economy and/or society? *(i.e. triple bottom line impact)* ○ Yes ○ No ○ Unsure	Go! **If Yes** Proceed to the next question. Wait! **If No or Unsure** Go to the supporting tool to help you brainstorm which social, environmental and economic impacts and benefits your technology solution could contribute to if successfully commercialised: **Triple Bottom Line Impact Worksheet** *https://commercialisationplus.org/resources/tools/2b/*

Relationships & Network Readiness

Commercialisation PLUS can be described as taking the experiment from the laboratory to the real world. This involves testing assumptions and validating facts about the regulatory environment, potential customers, potential end users, potential collaborators and partners, etc. Strong trusting relationships are important for this process.

Therefore, the *Relationships & Network Readiness* question for this step is about helping you identify who is in your network and who you need to build relationships with to help commercialise your technology solution.

Readiness check	Actions
Have you mapped out who you know and/or have in your personal and professional network who are connected to the commercialisation value chain and those who will likely benefit from your technology solution? ○ **Yes** ○ **No** ○ **Unsure**	Go! **If Yes** Proceed to the next question. Wait! **If No or Unsure** Go to the supporting tool to help create strategies about how you will collect market intelligence, specifically with whom engage first: **Part C of the Market Discovery Guide** *https://commercialisationplus.org/resources/tools/2a/c/*

Customer/Client

Engaging with people who are willing to pay for your technology solution

Customer/Client Readiness

A potential customer/client *(i.e. the people willing to buy your technology)* will have a range of motivations and perspectives about why the technology solution could be of value to them. Understanding the business challenges they face, as well as the potential innovation opportunities associated with these challenges, is an important foundation to identifying the best path to market for your technology solution.

Readiness check	Actions
Has your targeted potential customers/ clients expressed interest in the problem your technology solution can help address? ○ **Yes** ○ **No** ○ **Unsure**	 **If Yes** Proceed to the next question.  **If No or Unsure** Go to the supporting tool to help you identify the potential industries your technology could benefit: **Part D of the Market Discovery Guide** *https://commercialisationplus.org/resources/tools/2a/d/*

A Snapshot from Commercialisation PLUS practice

Viet Nam National University of Agriculture:
Maximising quality and quantity of the potato chip processing industry

This spin-out business based at the Institute of Agro-Biology has cultivated and produce high-yielding, disease-free potatoes that meet industrial potato chip processing requirements thus leading to a new value chain in the north of Viet Nam.

Dr Nguyen Xuan Truong explains how it is important to better understand the risks and opportunities associated with their business model and to identify potential partners for cooperation and spreading or mitigate the commercialisation risks associated with building a sustainable business.

To hear more from the researcher go to:
https://commercialisationplus.org/resources/video-library/

Thanks to:

Dr Nguyen Xuan Truong
Director, Institute of Agrobiology
Viet Nam National University of Agriculture

https://vienshnn.vnua.edu.vn

Step 3:
Considering your legal and regulatory obligations to protect your Intellectual Property (IP) and legally launching in the market.

Objectives of Step 3

A key foundation for successful commercialisation is compliance with local laws and regulations associated with both 1) protecting your IP, appropriately acknowledging use of IP, and 2) understanding regulations associated with the market into which you plan to launch your technology solution.

Step 3 aims to help you understand the legal and regulatory considerations as well as any requirements associated with use and protection of Intellectual Property (IP) in your technology solution.

At the end of this step you should be confident that…

1) You have considered the relevant regulatory requirements/obligations governing the market and the value chain that your technology solution will benefit.
2) You are aware of all potential disclosed and granted IP used by your technology solution.
3) You understand which aspects of your technology solution are novel and may need protecting.
4) You are aware of all technology transfer regulations and requirements you need to fulfill before you can transfer and earn revenue from your technology.

There are different legal and regulatory considerations and IP regulations that you will need to consider in Viet Nam as part of the Commercialisation PLUS process. Refer to Chapter 2 to better understand these requirements.

This step focuses primarily on setting up the foundations needed for your IP Strategy (which is developed and executed in later steps).

What I need to do in Step 3

The following guidance is based on the Commercialisation PLUS Readiness Capability categories. The following suggested actions are dependent on the results of your Commercialisation PLUS readiness assessment.

Figure 3.7 highlights the capability categories which indicate the knowledge, skills and experience required to complete Step 3. Each capability category is described in more detail below.

Note:
Not all steps require actions from each of the six readiness capability categories. Different steps require different capabilities.

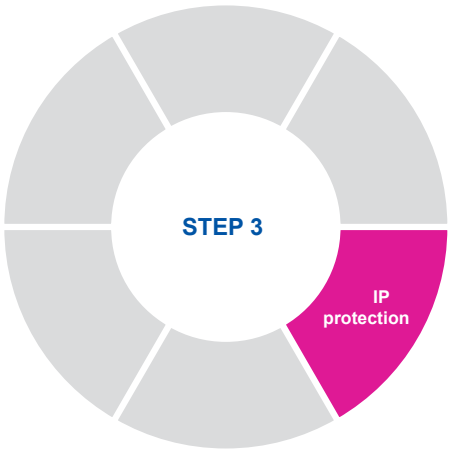


Figure 3.7: The Readiness Capability categories applicable in Step 3

IP Protection

Ensuring appropriate protections are in place to underpin your commercial pathway

IP Protection Readiness

IP Protection Readiness in this step is about understanding **all** the relevant legal and regulatory obligations that will impact the path to market of your technology solutions. This includes analysing which IP will need protection or acknowledgement (created either by you, your research team, or others), as well as checking relevant market regulations. In other words, the guidance for IP protection in this step will help establish the necessary foundational legal protections to facilitate an effective commercialisation process going forward.

Readiness check	Actions
Do you know if and what regulatory approval is needed for your technology solution to be launched in the market (either within or outside of Viet Nam)? ○ **Yes** ○ **No** ○ **Unsure**	Go! **If Yes** Proceed to the next question. Wait! **If No or Unsure** Go to the supporting tool to help you decide who to contact about the regulations that need to be considered and complied with for your solution to reach the market: **Contact guide for regulation support** *https://commercialisationplus.org/resources/tools/3c/*
Have you documented the existing relevant intellectual property ***(i.e. prior art or competing art)*** **for your technology solution?** ○ **Yes** ○ **No** ○ **Unsure**	Go! **If Yes** Proceed to the next question. Wait! **If No or Unsure** Go to the supporting tool to help you search for any prior art or competing art that could contest the novelty of your IP and also inform discussions with experts about what legal protection is possible and appropriate for your technology solution: **Guide to Patentability/Novelty Searching** *https://commercialisationplus.org/resources/tools/3a/*

Readiness check	Actions
Have you identified the different types of Intellectual Property (IP) underpinning your technology solution? ◯ **Yes** ◯ **No** ◯ **Unsure**	 **If Yes** Proceed to the next question.  **If No or Unsure** Go to the supporting tool to help you discuss with IP experts your technology solution including what is novel IP and/or exists already, different IP options, and inventor(s): **IP Pre-disclosure form** *https://commercialisationplus.org/resources/tools/3b/*

A Snapshot from Commercialisation PLUS practice:

Viet Nam Academy of Science and Technology:
Nano-products for clean, green farming

This research team has developed novel nano products using biodegradable material from agricultural waste. When used in fertiliser production, they can create a more climate-resilient, environmentally friendly alternative.

Dr Le Thi Thu Huong explains the importance of considering the legal and regulatory requirements before going too far in the commercialisation process. She also describes how the team is working through the regulatory considerations associated with transferring a nanotechnology into the market in Viet Nam.

To hear more from the researcher go to:
https://commercialisationplus.org/resources/video-library/

Thanks to:

Dr Le Thi Thu Huong
Vice Head of Department of Chemistry, Faculty of Environment
Researcher at the biomedical nanomaterials laboratory, Institute of Materials Science,
Vietnam Academy of Science and Technology
Viet Nam National University of Agriculture

https://vnua.edu.vn/

Phase B: Defining the value of your technology solution and planning your market strategy

Planning to launch your technology solution into the market

Phase B is about developing your plan to launch your technology solution into the market. The process includes: developing and validating the value of your technology; planning the path to market; and gaining approval and agreement with industry and key stakeholders. This includes gathering evidence around questions such as:

- Who is willing to pay for my technology solution?
- Does my technology solution provide value to these potential customers and end users?
- What is the best path for my technology solution to reach these customers?
- From whom do I need to receive approval to advance this path to market?
- How do I protect my solution to best fit this Commercialisation PLUS strategy?
- Is my technology solution ready for market and does my technology solution have a commercially viable pathway which can contribute to change in the society, economy and environment?

The steps in this phase are designed to help you answer these questions and other important questions to help you complete more pieces of the Commercialisation PLUS "puzzle". Ultimately, these puzzle pieces help you discover and make decisions about the value of your technology solution to the market and the best pathway to transfer it into the market.

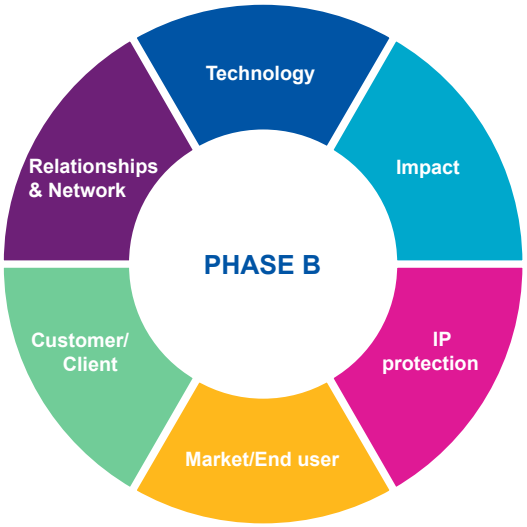
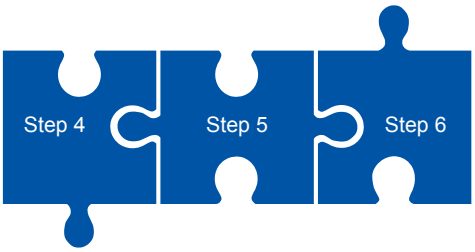


Figure 3.8: The Readiness Capability categories applicable in Phase B

The steps in this phase include:



Step 4:
Defining and valuing your technology solution to the market

Step 5:
Deciding and receiving approval for your pathway to launch your technology solution in the market

Step 6:
Validating your Commercialisation PLUS strategy with potential customers

Step 4:
Defining and validating the value of your technology solution in the market

Objectives of Step 4

Step 4 aims to help you understand:

a) The market opportunity, including the value that your solution brings to the market (compared to competitors),

b) The perceived value (see note below) of your technology solution as assessed by end users and potential customers/clients, and

c) Your path to impact, including indicators, assumptions and potential risks and consequences along the path.

At the end of this step you should be confident that…

1) The value of your minimum viable product has been validated with end users and potential clients.

2) You can communicate the value of your technology solution to potential customers/clients.

3) You have planned a preferred path to impact, including indicators to monitor any changes in the economy, environment and society (Triple Bottom Line).

4) You have put in place confidentiality agreements to protect your technology solution where required.

Note

The perceived value is the customers' evaluation of the merits of a product or service, and its ability to meet their needs and expectations, especially in comparison with its peers.

Overall, in this step you will understand the needs and demands of the market. This will help you identify if these needs correspond to the benefits that your technology solution can offer. Step 4 will also help you recognise any potential issues with the features of your technology solution as well as its potential impact on society, the economy or the environment.

What I need to do in Step 4

The following guidance is based on the Commercialisation PLUS Readiness Capability categories. The following suggested actions are dependent on the results of your Commercialisation PLUS readiness assessment.

Figure 3.9 highlights the capability categories which indicate the knowledge, skills and experience required to complete Step 4. Each capability category is described in more detail below.

Note:
Not all steps require actions from each of the six readiness capability categories. Different steps require different capabilities.

Figure 3.9: The Readiness Capability categories applicable in Step 4

Impact Readiness

An important element of the Commercialisation PLUS process is to ensure that you take into consideration how your technology solution can contribute to sustainable development. Therefore, this step is about developing an impact pathway that allows you to map the different benefits of your solution for different users across the value chain. For example, the customer who first adopts your technology may be primarily interested in achieving an increase in sales and profitability for their business, while the end users (consumers) of your technology might be interested in the health benefits it provides.

Readiness check	Actions
Have you planned a path for how your technology solution will contribute to your desired impacts, including assumptions and risks associated with this path to impact? ◯ **Yes** ◯ **No**	Go! **If Yes** Proceed to the next question. Wait! **If No** Go to the supporting tool to help define and validate your path to intended or desired impacts *(i.e. sustainable development ambitions)* with key stakeholders: **Part A of the Guide to impact planning and monitoring** *https://commercialisationplus.org/resources/tools/4a/a/*
Have you identified indicators to track your progress to impact? ◯ **Yes** ◯ **No**	Go! **If Yes** Proceed to the next question. Wait! **If No** Go to the supporting tools for tips around for developing indicators that can measure change: **Part B of the Guide to impact planning and monitoring** *https://commercialisationplus.org/resources/tools/4a/b/*

Market/End user Readiness

How your technology solution meets the needs of the end users (or the consumers/market) in the value chain is an important factor in the Commercialisation PLUS process. The end users are the principal value chain actors and the essential reason that a customer/client will potentially want to buy (and/or manufacture) your technology solution. With this in mind, the *Market/End user Readiness* questions in this step focus on testing your assumptions around how your technology can improve the lives of the end users.

Readiness check	Actions
Can you articulate the needs or problems that your technology solution could solve for end users? ◯ **Yes** ◯ **No**	Go! **If Yes** Proceed to the next question. Wait! **If No** Go to the supporting tool to consolidate the information you have collected so far regarding the benefits of your technology solution for end users and the potential market for likely customers: **Part A of the Value proposition guide** *https://commercialisationplus.org/resources/tools/4b/a/*
Have you communicated and validated the potential benefits or value for end users *(e.g. tested the potential market value of your technology solution with end users and potential customers)***?** ◯ **Yes** ◯ **No**	Go! **If Yes** Proceed to the next question. Wait! **If No** Go to the supporting tool to validate the draft value proposition that you have developed with a sample of end users: **Part B of the Value proposition guide** *https://commercialisationplus.org/resources/tools/4b/b/* *Note:* *Keep the feedback collected during these discussions and it can be referred to during value proposition validation discussions with potential customers later in your Commercialisation PLUS journey.*

Customer/Client Readiness

It is important to understand the different needs of the company/organisation that will potentially pay you for your technology solution as well as how much they would be willing to pay for your technology solution, i.e. the market value of your technology solution. Therefore, the *Customer/Client Readiness* question in this step focuses on understanding and being able to communicate the benefits, or value, that your technology solution can add to their business. This includes the "selling points" or the marketing strengths of your technology solution.

Readiness check	Actions
Have you communicated and validated if the benefits of your technology solution is of value to your targeted potential customers/clients i.e. how does it add value to their business *(e.g. efficiency and effectiveness improvements)* **and help create potential new market opportunities?** ○ **Yes** ○ **No**	Go! **If Yes** Proceed to the next question. Wait! **If No** Go to the supporting tool to validate the draft value proposition that you have developed with potential customers/clients including individual businesses and industry groups: **Part B of the Value proposition guide** *https://commercialisationplus.org/resources/tools/4b/b/*

IP Protection

Ensuring appropriate protections are in place to underpin your commercial pathway

IP Protection Readiness

It is important to protect your intellectual property as it forms the basis of commercialising your technology solution. It can be tricky to have conversations with customers and clients about your technology solution while ensuring that your secret formula, novel feature, or new ingredient are kept confidential. Therefore, in this step, *IP Protection Readiness* is about establishing a contract between two or more parties where the subject of the agreement is a promise that the information shared will be remain confidential.

Readiness check	Actions
Have you established a confidentiality agreement with potential clients, partners, team members etc., to protect your novel intellectual property where needed? ◯ **Yes** ◯ **No** ◯ **Unsure** ◯ **Not applicable**	Go! **If Yes or Not applicable** Proceed to the next question. Wait! **If No or Unsure** Go to the supporting tool to help you understand what information should be kept confidential and how to protect it so that you can continue to progress along the Commercialisation PLUS process: **Confidentiality guide** *https://commercialisationplus.org/resources/tools/4c/*

Technology Readiness

Before a technology solution can be transferred to a customer, you need to know that it meets their needs, this may require some refinement of the technology solution.

For example, a new sensor was developed and it sent updated information every three hours to its users. However, discussions with end users revealed that they needed the information every hour, otherwise additional problems arose in their production system. Consequently, this technology is not ready for the market and refinement of the features of the technology solution is needed to meet the specific needs of the end users and customers.

This step will ensure that the technology is appropriate for the market needs. The *Technology Readiness* question therefore helps you to verify if you have developed a Minimum Viable Product[32] (MVP) which can be validated through discussions potential end users and customers.

Readiness check	Actions
Have you created communication materials around your minimal viable product to share the value of your technology? ◯ **Yes** ◯ **No**	 **If Yes** Proceed to the next question.  **If No** Use the supporting tool to help you articulate and support discuss around the usefulness or benefits and value of technology solution: **Technology solution information card** *https://commercialisationplus.org/resources/tools/4d/* *Note from practice:* *This does not need to involve showing or demonstrating the actual solution, refer to the IP Protection Readiness for this step. The communication materials should communicate the benefits and value for potential customers/clients and end users rather than technical specifications.*

32. *For the purposes of this guide, a Minimum Viable Product (MVP) is a version of your technology solution that has features developed just to get feedback from potential end users and customers to provide direction for future product development.*

Relationships & Network Readiness

Informal discussions with your network can often allow you to discover new and interesting insights around the needs and challenges that you could help solve with your expertise and technology solutions. It is often easier to talk to people who you know first, rather than finding new people with whom to engage. Therefore, do not underestimate the value and opportunities that these relationships can bring, as well as receiving useful information about important features needed for any technology solution during these conversations.

Consequently, the focus for *Relationships & Network Readiness* in this step is about managing and maintaining your relationships and networks, as they can be a useful source of market knowledge and insights.

Readiness check	Actions
Is your network aware of the research expertise that underpins your ability to solve problems for this industry? ○ **Yes** ○ **No** ○ **Unsure**	 **If Yes** Proceed to the next question.  **If No or Unsure** Go to the supporting tool to help orient discussions around what is your team's expertise and how it can help industry solve problems: **Capability statement** *https://commercialisationplus.org/resources/tools/4e/*

A Snapshot from Commercialisation PLUS practice

Viet Nam Can Tho University:
Automated sensor technology for the aquaculture industry

An innovative prototype sensor technology that mimics processing by hand, also minimises waste, saves labour and time, optimises food safety and has the potential to open new markets for the shrimp and other food processing industries.

Dr Nguyen Thanh Tung explains the importance of understanding the value of the breadth of the capability within your research team as well as being ready to respond to market feedback and develop new value propositions.

To hear more from the researcher go to:
https://commercialisationplus.org/resources/video-library/

Thanks to:

Dr Nguyen Thanh Tung
Lecturer, Department of Electronics and Telecommunication Engineering
Can Tho University (CTU)

https://cet.ctu.edu.vn/

Step 5:
Deciding upon and getting approval for your Commercialisation PLUS strategy

Objectives of Step 5

Step 5 aims to support transparent and evidence-based decision making by building an enhanced understanding about:

a) The risks associated with different market pathways,

b) The required collaborators with whom to engage to receive approval for a preferred path to market,

c) The business model best suited to your potential customers and your organisation's commercialisation goals,

d) If you have freedom to operate, and

e) The best strategy to protect your IP.

At the end of this step you should be confident that…

1) You have assessed the different risks to determine your preferred path to market.

2) You have developed a business plan including an appropriate pricing strategy, IP control and exploitation strategy, etc.

3) You comply with technology valuation regulations by the Vietnamese Government.

4) You have identified any potential collaborators who are needed to help transfer your technology to market.

5) You have received approval for your preferred path to market.

Ultimately, this step is about providing logical and evidence-supported justifications to the decision-makers in your organisation regarding your preferred path to market and your proposed business plan.

What I need to do in Step 5

The following guidance is based on the Commercialisation PLUS readiness capability categories. The suggested actions are dependent on the results of your Commercialisation PLUS readiness assessment.

Figure 3.10 highlights the capability categories which indicate the knowledge, skills and experience required to complete Step 5. Each capability category is described in more detail below.

Note:
Not all steps require actions from each of the six readiness capability categories. Different steps require different capabilities.

Figure 3.10: The Readiness Capability categories applicable in Step 5

Impact Readiness

Impact is not delivered solely by the research team. All the actors along the value chain and impact pathway have a role to play, and it is important that the key actors (such as the funders of your research, your commercialisation partner/s and customers), are aware and are in agreement regarding your impact plan. This is especially important where you must rely on these actors to track your progress and provide data to measure against performance indicators. Therefore, the focus for your *Impact Readiness* in this step is to ensure that your impact goals are explicitly considered while planning your path to market and also included in your final Commercialisation PLUS strategy.

Readiness check	Actions
Do internal stakeholders *(e.g. the TTO, Legal, Marketing team, Rector, etc.)* **agree and support your preferred impact pathway and associated performance indicators and understand how it supports your Commercialisation PLUS strategy?** ◯ **Yes** ◯ **No** ◯ **Unsure**	Go! **If Yes** Proceed to the next question. Wait! **If No or Unsure** Use your completed Impact plan from Step 4 to help facilitate discussions with key internal stakeholders about how your desired impact pathway and performance measures can support your Commercialisation PLUS strategy.
Does your Commercialisation PLUS strategy explain how your path to market supports your potential impact pathway? ◯ **Yes** ◯ **No**	Go! **If Yes** Proceed to the next question. Wait! **If No** Go to the supporting tool and copy your impact goals from Part B of the Guide to impact planning and monitoring (Step 4): **Commercialisation PLUS Strategy** *https://commercialisationplus.org/resources/tools/5c/*

Market/End user Readiness

There are several different possible paths to market for all technologies. It can be challenging to decide on the pathway that best fits your technology as well as the market needs. There is no right or wrong answer, so it is important to be able to clearly communicate and provide a rational justification for your preference for one path over another. You are looking for the point of equilibrium between all of these variables (also known as a 'sweet spot') that:

- Works with the capability of your potential customers
- Considers the market conditions/barriers to market
- Considers the technology update conditions/barriers to adoption, and
- Considers potential reach/scale of your technology

Therefore, the focus for the *Market/End user Readiness* in this step is analysing the information collected in previous steps to make an informed decision around the best path to market.

Readiness check	Actions
Do you understand the potential risks connected with launching your product in the market and the implications on different paths to market? ◯ Yes ◯ No ◯ Unsure	Go! **If Yes** Proceed to the next question. Wait! **If No or Unsure** Go to the supporting tool to assist you in working through the risk associated with commercialising your technology solution and to identify the most feasible paths to market with the help of your research team and TTO: **Commercialisation Pathway Selector** *https://commercialisationplus.org/resources/tools/5a/*
Does your Commercialisation PLUS strategy communicate why you chose your commercialisation pathway? ◯ Yes ◯ No	Go! **If Yes** Proceed to the next question. Wait! **If No** Go to the supporting tool to help you develop your Commercialisation PLUS strategy: **Commercialisation PLUS Strategy** *https://commercialisationplus.org/resources/tools/5c/*

IP Protection Readiness

To ensure that the ownership of your technology solution can legally be transferred to others, a range of different elements need to be considered first. The checklist includes verifying if you are infringing on someone else's IP, valuing your technology to help you negotiate a fair deal, and protecting the investment of the IP.

This process also involves determining the best intellectual property exploitation strategy that can deliver value and support in both protecting your IP as well as the preferred path to market for your technology solution. Therefore, the focus for *IP Protection Readiness* in this step is to ensure that you are legally protected and that you have permission to transfer the ownership of the IP of your technology solution.

Readiness check	Actions
If your technology solution uses IP from another source, do you have freedom to use it? *(i.e. are you sure that you are not infringing on anyone else's intellectual property?)* ◯ **Yes** ◯ **No**	 **If Yes** Proceed to the next question.  **If No** See Chapter 2 "Special Focus: Freedom to operate terms of reference" for help on how to engage an IP expert/Patent Attorney to complete a search and provide you with legal advice around the use of this IP, including any potential infringements.

Readiness check	Actions
If your technology is funded 30% or more by the Vietnamese Government, have you completed a technology valuation with an accredited valuation expert? ◯ **Yes** ◯ **No** ◯ **Unsure**	Go! **If Yes** Proceed to the next question. Wait! **If No or Unsure** Contact the Viet Nam Centre for Science & Technology Evaluation (www.vistec.gov.vn) under the Ministry of Science and Technology for a referral to an accredited technology valuation professional. Or, go to the supporting tool from Step 3 to help you decide who to contact about the regulations that need to be considered and complied with for your solution to reach the market: **Regulation support contacts guide** *https://commercialisationplus.org/resources/tools/3c/*
Have you developed a formal IP strategy to control it use and manage financial return? ◯ **Yes** ◯ **No** ◯ **Unsure**	Go! **If Yes** Proceed to the next question. Wait! **If No or Unsure** Contact your Intellectual Property Office (IPO) or the Intellectual Property Department for expert advice on developing an IP strategy that best supports your preferred commercialisations strategy. *Note:* *Developing an IP Strategy helps you think through which IP protection mechanism can best support the achievement of your goals (including Path to Market and Impact Pathway).*

Relationships & Network Readiness

Successful commercialisation often requires collaboration with more than just the customer/client to whom you will transfer your technology. Collaboration with other value chain actors is often required to address issues impacting your commercialisation process that are beyond the control of your or your customer/ clients, e.g. regulations. Therefore, the *Relationships & Network Readiness* questions in this step are focused on identifying and building relationships with potential partners in the value chain.

Readiness check	Actions
Have you established partner(s)/ collaborator(s) beyond customers/ clients to implement your preferred Commercialisation PLUS strategy? ○ **Yes** ○ **No** ○ **Unsure** ○ **Not applicable**	 **If Yes or Not applicable** Proceed to the next question  **If No or Unsure** Go to the supporting tool to help facilitate, open, transparent, and equitable discussions with collaborators to help you consider if there are potential partners that could help your technology reach the market: **Part A of the Partnership guide** *https://commercialisationplus.org/resources/tools/5d/a/*

A Snapshot from Commercialisation PLUS practice

Viet Nam Can Tho University:
Oil processing for the cosmetic industry

An original oil recipe that is adding value to the fruit sector is also delivering a product for the cosmetic industry.

Dr Luu Thai Danh explains the importance of having the courage to act on evidence that suggests you may need to repeat a step in the puzzle.

To hear more from the researcher go to:
https://commercialisationplus.org/resources/video-library/

Thanks to:

Dr Luu Thai Danh
Lecturer
College of Agriculture
Can Tho University

https://coa.ctu.edu.vn/

Step 6:
Validating your Commercialisation PLUS strategy with the potential customers

Objectives of Step 6

Step 6 aims to help you understand how to:

a) Test and refine your chosen strategy in consultation with the market *(i.e. potential customers)* to validate your preferred path to market as a viable option, and

b) Identify specific requirements from customers that may influence the execution of your strategy, e.g. exclusive rights to use in a licence.

At the end of this step you should be confident that…

1) You have tested and refined, where appropriate, your Commercialisation PLUS strategy to meet market needs.

2) You have a strategy to manage collaborations.

It is important to test your commercialisation plan with external stakeholders, i.e. customers and partners; it sets you up for success. Even if you are convinced that one particular pathway is the best option, it does not mean that other key actors will think the same way.

Depending on timing, this step can often be done in parallel to some of the approval activities in Step 5. Strong relationships can help improve the efficiency and effectiveness of this process.

Ultimately, this step is about validating your assumptions. In consultation with other value chain actors, you will be able to confirm that the assumptions and the logic that underpin your risk assessment are valid and that your preferred path to market is appropriate.

What I need to do in Step 6

The following guidance is based on the Commercialisation PLUS readiness capability categories. The suggested actions are dependent on the results of your Commercialisation PLUS readiness assessment.

Figure 3.11 highlights the capability categories which indicate the knowledge, skills and experience required to complete Step 6. Each capability category is described in more detail below.

Note:
Not all steps require actions from each of the six readiness capability categories. Different steps require different capabilities.

Figure 3.11: The Readiness Capability categories applicable in Step 6

Technology Readiness

This is the final point in the Commercialisation PLUS process that you will consider your technology readiness. Therefore, the focus of the *Technology Readiness* question is examining if you have refined your technology solution in line with the feedback and evidence collected through the earlier steps.

Readiness check	Actions
Have you identified and implemented any modifications needed to produce your technology at scale? ○ **Yes** ○ **No** ○ **Unsure**	 **If Yes** Proceed to the next question.  **If No or Unsure** Discuss with potential customers (under confidentiality agreements) the specific needs for large scale production to ensure your technology meets their needs and does not require modifications. If for some reason you cannot have a conversation under confidentiality, go to the supporting tool for tips about holding discussions without giving away your IP or other confidential information. **Tips for discussing your technology solution without giving away IP secrets** *https://commercialisationplus.org/resources/tools/6b/*

Impact Readiness

Measuring your impact is highly dependent on cooperation from all stakeholders involved in implementing the Commercialisation PLUS strategy. Consequently, is it often helpful to talk to the decision-makers linked to your impact pathway. In addition, it is important to be able to clearly explain how you have arrived at the value proposition for your technology solution and your preferred Commercialisation PLUS strategy. The focus for the *Impact Readiness* question in this step is therefore on ensuring that your stakeholders agree and approve of your impact plan, including the proposed performance measures and sources of data.

Readiness check	Actions
Have you discussed and agreed/ validated your impact plan and performance measures with your key external stakeholders as part of your Commercialisation PLUS strategy? ○ **Yes** ○ **No** ○ **Unsure**	 **If Yes** Proceed to the next question  **If No or Unsure** Discuss with potential customers your impact goals and pathway, as part of your commercialisation strategy to identify any needs to help realise outcomes and impacts. *Note:* *These conversations are typically done under confidentiality agreements to build trust and protect the potential customers/client's business secrets.*

IP Protection Readiness

Ensuring your IP strategy meets the needs of the market is a critical step in the Commercialisation PLUS process. It is important that the correct protection strategy is selected, which is also in line with customer expectations. For example, check by asking “Do I need to patent my technology solution or is “trade secret” a better option for the market/industry where I am trying to transfer my technology?”. Therefore, the focus of the *IP Protection Readiness* in this step is testing your proposed strategy with value chain actors to ensure it is ‘fit for purpose’.

Readiness check	Actions
Have you tested your IP financial return and protection strategy with value chain actors? ○ **Yes** ○ **No** ○ **Unsure** ○ **Not applicable**	 **If Yes or Not applicable** Proceed to the next question.  **If No or Unsure** Discuss with potential customers your proposed IP strategy to determine if it aligns with their expectations and adjust if needed.

Market/End user Readiness

There are a number of different paths to market and ensuring your preferred strategy meets market expectations and needs is important for successful commercialisation outcomes. Therefore, the *Market/End user Readiness* in this step is about ensuring you have undertaken the necessary consultation to validate that your preferred strategy aligns with market needs and expectations.

Readiness check	Actions
If your preferred path to market is either a spin-out/spin-off, trade sale, or start-up incubation, do you have a strategic marketing/communication plan which includes strategies to raise awareness, enter the market, manage competitors and grow market share? ○ Yes ○ No ○ Unsure ○ Not applicable *Note:* • *If your path is licencing, this is done by the licensee, and* • *If your path is government acquisition, this is their responsibility.*	**If Yes or Not applicable** Proceed to the next question. **If No or Unsure** Engage a marketing specialist to help you develop a marketing/communication plan to support your Commercialisation PLUS strategy. Go to the supporting tool for advice on how to engage a marketing specialist to develop a marketing plan: **Marketing Specialist Terms of Reference guide** *https://commercialisationplus.org/resources/tools/6c/* *Note:* *This can be done without the specialist expertise, but it increases your risk.*

Relationships & Network Readiness

Open, transparent and equitable relationships with potential collaborators are a key foundation for managing and maintaining strong and healthy relationships. Therefore, the focus for *Relationships & Network Readiness* for this step is developing a strategy to manage these relationships.

Readiness check	Actions
Do you have a strategy to manage any potential collaborations beyond customer/client contracts? ◯ **Yes** ◯ **No** ◯ **Unsure**	Go! **If Yes** Proceed to the next question. Wait! **If No or Unsure** Go to the supporting tools to better understand the necessary steps you need to consider when preparing to partner: **Part B of the Partnership guide** *https://commercialisationplus.org/resources/tools/5d/b/*

A Snapshot from Commercialisation PLUS practice

Viet Nam Academy of Science and Technology (VAST):
Kombucha

A start-up company launched on the basis of an innovative recipe to produce and introduce the beverage 'Kombucha' to the Viet Nam market.

Dr Nguyen Hoang Duong explains the importance of validating and using feedback from the market to inform your Commercialisation PLUS strategy before implementation.

To hear more from the researcher go to:
https://commercialisationplus.org/resources/video-library/

Thanks to:

Dr Nguyen Hoang Duong
Position: Director of Soft Matter and Biological Physics Center
Viet Nam Academy of Science and Technology

https://vast.gov.vn/

Phase C: Implementing and managing your strategy for impact
Launching your technology solution into the market and managing for impact and scale

The third phase is about launching your solution into the market and managing it for impact and scale. This phase focusses on developing your implementation process. It also helps you review any changes (or impacts) that your technology solution has contributed to within society, the economy, or the environment, because of the commercialisation process so far. In this phase you will be asked to gather information on the following points:

- Who can you approach and where you can seek funding and other resources.
- How to communicate and pitch your technology solution to potential investors.
- What are the essential ingredients for successful "interest-based" negotiation between stakeholders.
- The "what, when, why and how" to use different types of agreements to execute your Commercialisation PLUS strategy.
- How to build and nurture short- and long-term relationships to support your current and future commercialisation plans.
- How to undertake evaluations to demonstrate the realised value of your technology solution.

The steps in this phase will help you complete more pieces of the Commercialisation PLUS puzzle to help you discover how your technology solutions fits with the market needs.

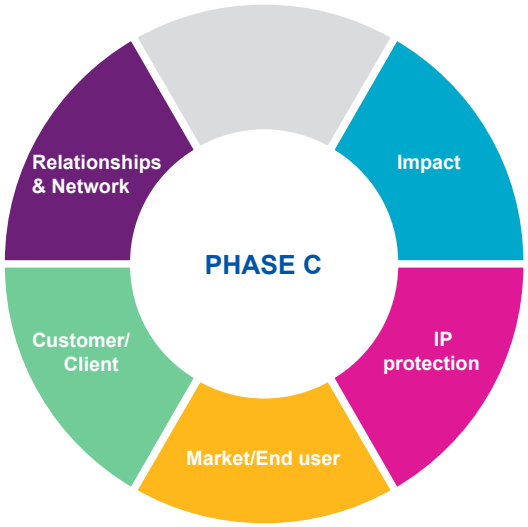
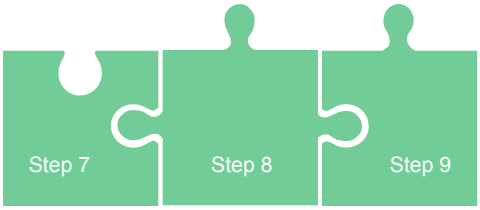


Figure 3.12: The Readiness Capability categories applicable in Phase C

The steps in this phase include:



Step 7:
Executing your go-to-market strategy, including sourcing resources and negotiating conditions for use of your technology solution

Step 8:
Managing your commercialisation relationships to ensure your Commercialisation PLUS strategy is executed and new opportunities are optimised

Step 9:
Evaluating the contribution of your technology solution to sustainable development impacts (social, environmental and economic)

Step 7:
Executing your go-to-market strategy, including sourcing resources and negotiating conditions for use of your technology solution

Objectives of Step 7

Step 7 aims to help you understand how to:

a) Pitch your technology solution to show its value to potential customers/clients and to others willing to invest in your solution,

b) Negotiate conditions of use for different types of IP,

c) Finalise legal contracts that protect your solution, as well as aligning with your impact goals and organisational/legal responsibilities, and

d) Build partnerships that support your strategy's goals.

At the end of this step you should be confident that…

1) Your contract includes clauses that protect your IP and ensures that it is managed in line with the goals of your IP strategy.

2) Marketing materials for the technology solution have been developed, showcasing its value to different customers/clients.

3) You have secured resources to pay for the implementation of your Commercialisation PLUS strategy.

4) You are implementing a strategy to manage your collaborators.

Step 7 is essentially about executing (*or putting into action*) your Commercialisation PLUS strategy, by sourcing and negotiating financial, human, and other resources to support your plan.

What I need to do in Step 7

The following guidance is based on the Commercialisation PLUS readiness capability categories. The suggested actions are dependent on the results of your Commercialisation PLUS readiness assessment.

Figure 3.13 highlights the capability categories which indicate the knowledge, skills and experience required to complete Step 7. Each capability category is described in more detail below.

Note:
Not all steps require actions from each of the six readiness capability categories. Different steps require different capabilities

Figure 3.13: The Readiness Capability categories applicable in Step 7

Market/End user Readiness

In some fortunate cases, you will already have a customer who has committed to purchase your technology solution early in the process, or to co-develop a technology solution with you. However, if this is not the case, to execute your Commercialisation PLUS strategy you will need to secure financial resources to implement your approved Commercialisation PLUS strategy. Therefore the focus of the *Market/End user Readiness* question in this step is about preparing the necessary materials to support revenue raising activities, if required.

Readiness check	Actions
Have you developed marketing materials to help raise revenue and secure other resources for the technology solution? ◯ **Yes** ◯ **No**	 **If Yes** Proceed to the next question.  **If No** Go to the supporting tool to help you think through your pitch and develop communication materials and messages for your technology solution: **A pitch development guide** *https://commercialisationplus.org/resources/tools/7a/*

Customer/Client Readiness

Closing the deal is one of the hardest and most important milestones in the Commercialisation PLUS process. The focus of the *Customer/Client Readiness* questions in this step aim to help you assess how ready you are to undertake this activity. Supporting tools are provided where needed.

Readiness check	Actions
Have you secured financial resources to execute your Commercialisation PLUS strategy? ◯ Yes ◯ No	Go! **If Yes** Proceed to the next question. Wait! **If No** Work with your legal team to finalise a contract with a client to ensure clauses are in line with organisational policies, that legal obligations are met, and your commercialisation objectives are supported.
Do you know how to undertake an interest-based negotiation? ◯ Yes ◯ No ◯ Unsure ◯ Not applicable	Go! **If Yes or Not applicable** Proceed to the next question. Wait! **If No or Unsure** Go to the supporting tool to enhance your understanding on how to approach a negotiation with a potential customer/client: **Guide to interest-based negotiation** *https://commercialisationplus.org/resources/tools/7b/*

IP Protection Readiness

There are a number of elements to manage the execution of your IP strategy. These include[33]:

- Knowledge Management: because a lot of knowledge is informal and may or may not translate into a recognisable category of IP.
- IT (information technology) Strategic Planning: because a lot of Intellectual Property is IT-related and some of the more complex IP issues can arise in an IT context.
- Contract Management: because IP is often created (or improved) within the context of a contract (e.g. a supply contract or a joint venture relationship).
- Asset Management: because IP is an asset, albeit intangible, it has a value.
- Risk Management: because there are risks to an organisation flowing from the actions (or failure to act) of an IP strategy, as well as the risk of lost opportunity.

The focus for *IP Protection Readiness* in this step therefore aims to ensure that all of these aspects are achieved through contract management and implementation of the IP strategy.

Readiness check	Actions
Does your contract include clauses that protect your IP and manages its use in line with your IP Strategy? ◯ **Yes** ◯ **No**	Go! **If Yes** Proceed to the next question. Wait! **If No** Contact your legal team to help draft your contract or check the clauses in the contract.
Have you executed your IP Strategy, including registering for IP protection if appropriate? (e.g. patent, trademark, Copyright etc.)? ◯ **Yes** ◯ **No** ◯ **Not applicable**	Go! **If Yes or Not applicable** Proceed to the next question. Wait! **If No** Contact your organisation's Intellectual Property Office (IPO) or local IPO for support in protecting your novel intellectual property or recognising existing IP.

33. *https://www.epa.ee/sites/www.epa.ee/files/elfinder/dokumendid/2008_04_24_guriqbal_singh_jaiya2.pdf*

Relationships & Network Readiness

Successful implementation of your Commercialisation PLUS strategy will often require a range of collaborators/ partners that are in addition to the customer/clients and end users. Therefore, the focus for the *Relationships & Network Readiness* question in this step is primarily on seeking commitment from the relevant stakeholders to support your strategy.

Readiness check	Actions
Do you have an agreement with collaborators/partners beyond your customer/client to help implement your strategy? ◯ **Yes** ◯ **No**	 **If Yes** Proceed to the next question.  **If No** Go to the supporting tool to enhance your understanding about how to create an agreement with collaborators or partners that support diversity, shared goals and shared risks, mutual benefits and enhanced trust. **Part C of the Partnership Guide** *https://commercialisationplus.org/resources/tools/5d/c/*

A Snapshot from Commercialisation PLUS practice

Viet Nam Academy of Science and Technology (VAST):
Innovation for dragon fruit processing

Featuring a food processing technology that adds value to harvested dragon fruit, helping to reduce post harvest losses by up to 30% in the peak harvest season and create new products for the market.

Assoc. Prof. Tran Thi Dinh explains the importance of listening, being open and adaptive when negotiating with customers. You will also hear about the need to be careful when developing and agreeing the terms and conditions of contracts with the customer.

To hear more from the researcher go to:
https://commercialisationplus.org/resources/video-library/

Thanks to:

Assoc. Prof. Tran Thi Dinh
Head of Department of Food Processing Technology, Faculty of Food Science and Technology
Viet Nam National University of Agriculture

https://vnua.edu.vn/

Step 8:
Managing your commercialisation relationships to ensure that your strategy is executed and new opportunities are optimised

Objectives of Step 8

Step 8 aims to help you understand:

a) How to build and nurture trusting relationships,

b) The importance of continued engagement and open communication with partners, and

c) How to create new opportunities for commercialisation and impact from research.

At the end of this step you should be confident that…

1) You have established an open and trusting relationship with customers/clients.

2) You understand the innovation needs of your customers/clients and how your solution can help address them.

3) You have case studies that show results of collaboration and the commercialisation of your technology solution.

Step 8 is about building and maintaining trusted relationships with customers/clients and other key stakeholders involved in commercialising your technology solution. It can happen at any stage in the process but is most important after you have executed your Commercialisation PLUS strategy. It is well understood that it is easier to maintain existing customers/clients than to find new ones, so this is an ongoing process.

What I need to do in Step 8

The following guidance is based on the Commercialisation PLUS readiness capability categories. The suggested actions are dependent on the results of your Commercialisation PLUS readiness assessment.

Figure 3.14 highlights the capability categories which indicate the knowledge, skills and experience required to complete Step 8. Each capability category is described in more detail below.

Note:
Not all steps require actions from each of the six readiness capability categories. Different steps require different capabilities.

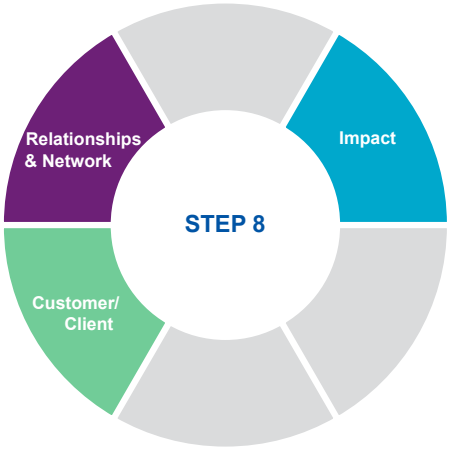


Figure 3.14: The Readiness Capability categories applicable in Step 8

Impact Readiness

There are multiple steps along the way to impact being realised. It is often helpful to track your progress to give you early indications of long term impact changes. Therefore, the focus for the *Impact Readiness* questions in this step is on the adoption, or use, of your technology once it has reached the market and securing a commitment to share information so that impact can be tracked later. At this stage in the process, you are focussing less on the idea if the use of the technology solution has led to any positive or negative change in society, the economy or the environment, but more on the number of consumers using the technology, or the spread of the technology solution.

Readiness check	Actions
Do you have any data collection systems or agreements to track early numbers of people using your technology solution *(i.e. adoption of your technology)***?** ◯ **Yes** ◯ **No**	 **If Yes** Proceed to the next question.  **If No** Consider including in your contracts with customers and partners, clauses that require them to supply data for agreed indicators and to participate in impact assessments. Go to the supporting tool for guidance on collecting evidence that tracks the impact of your technology solution: **Impact data guide** *https://commercialisationplus.org/resources/tools/8a*

Readiness check	Actions
Do you have partners who are willing to provide data and feedback/lessons learned? ◯ **Yes** ◯ **No**	 **If Yes** Proceed to the next question.  **If No** Go to the supporting tool to help you develop evidence and marketing materials about the change and value your technology has helped create for your customer/client and to help inform future impact evaluation and attribution of benefits: **Customer Case Study Guide** *https://commercialisationplus.org/resources/tools/8b/* *Note:* *A strong relationship is needed with your customers and partners because you cannot provide all the data yourself for these assessments.*

Customer/Client Readiness

Managing your relationship with your customer/client will depend on the type of Commercialisation PLUS strategy used. Therefore it is important to keep in mind your chosen path to market when answering the questions in for the *Customer/Client Readiness* in this step.

Readiness check	Actions
Have you explored all of the different opportunities for your technology solution to help your existing customers/ clients solve their innovation challenges? ◯ **Yes** ◯ **No**	**If Yes** Proceed to the next question. **If No** You may find the capability statement you developed in Step 4 useful here. If you did not do this in Step 4 go to the supporting tool to help you develop a capability statement around your team's expertise and how it can help industry solve problems: **Capability statement guide** *https://commercialisationplus.org/resources/tools/4e/* It is also advised that you schedule time to contact your customer/client to hear feedback and discuss other problems or needs they may be facing that you could help them with using other technology solutions or your expertise.
Do you or your customer(s) have a strategy to expand the use of the technology solution *(i.e. a scaling strategy)***?** ◯ **Yes** ◯ **No**	**If Yes** Proceed to the next question. **If No** Keep communication channels open with your customer(s) regarding their use of your technology and adapt agreements and contracts if needed.

Relationships & Network Readiness

It is often said that it is easier to maintain existing relationships than create new ones. In this spirit, the *Relationships & Network Readiness* in this step is focused on maintaining or managing relationships with customers/clients and collaborators with the view to generating more commercialisation opportunities in the future.

Readiness check	Actions
Have you checked the "health" of your collaborations with your customers and other partners? ◯ **Yes** ◯ **No**	Go! **If Yes** Proceed to the next question. Wait! **If No** Go to the supporting tool to take stock, share lessons, celebrate progress and identify where things could work better. **Part D of the Partnership guide** *https://commercialisationplus.org/resources/tools/5d/d/*

A Snapshot from Commercialisation PLUS practice

Viet Nam Can Tho University:
Healthier water for sustainable aquaculture and local development

Featuring a water quality monitoring information system that tracks key pollutants and provides alerts to industry and provincial authorities if risk levels are too high.

Dr Truong Minh Thai explains why you should maintain good relationships with customers/clients.

Remember: Continually finding new customers/clients is much more time consuming and resource intensive than managing relationships with existing customers.

To hear more from the researcher go to:
https://commercialisationplus.org/resources/video-library/

Thanks to:

Dr Truong Minh Thai
Head of Software Engineering Department,
College of Information and Communication Technology
Can Tho University (CTU)

https://www.ctu.edu.vn/

Step 9:
Evaluating the contribution of your technology solution to sustainable development impacts (social, environmental and economic)

Objectives of Step 9

Step 9 aims to help you understand:

a) The contribution that your technology solution has made to changes in society, the environment and the economy (positive and negative), and

b) How to build credibility and legitimacy as an organisation/ research team as a reliable source of commercialisation success.

At the end of this step you should be confident that…

1) You can confidently communicate the realised value of your technology solution and your stakeholders also have confidence in the results.

2) You have achieved a greater awareness of your role and the role of your partners, as well as making a contribution to a collective impact.

3) The evidence you have collected as part of your evaluation can help inform and improve future decisions and actions.

Step 9 will help you evaluate and communicate the change your technology solution has contributed to the economy, society and the environment (Figure 1.0), which helps build credibility and legitimacy for future commercialisation of technology solutions.

What I need to do in Step 9

The following guidance is based on the Commercialisation PLUS readiness capability categories. The suggested actions are dependent on the results of your Commercialisation PLUS readiness assessment.

Figure 3.15 highlights the capability categories which indicate the knowledge, skills and experience required to complete Step 9. Each capability category is described in more detail below.

Note:
Not all steps require actions from each of the six readiness capability categories. Different steps require different capabilities.

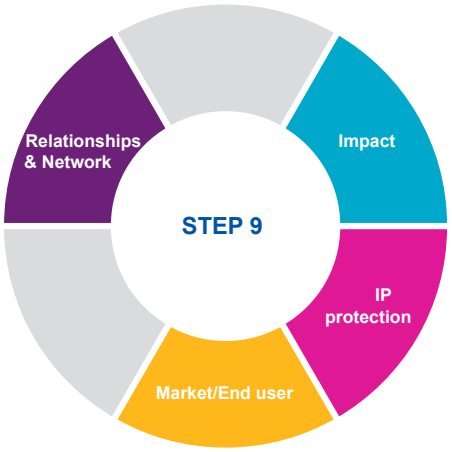


Figure 3.15: The Readiness Capability categories applicable in Step 9

Impact

Defining and measuring the impact and scale on society, the environment & the economy from your technology solution

Impact Readiness

It is not enough to simply state the goal of achieving social, environmental or economic impacts. This is especially true in situations where research is often funded by organisations that are not only interested in achieving a return on their investment, but also have an expectation of broader sustainable development in Viet Nam. The key purpose of an impact evaluation is to provide evidence of the impacts achieved through research commercialisation.

Readiness check	Actions
Do you know if your technology solution contributed to any positive or negative social, environmental or economic impact? ○ **Yes** ○ **No** ○ **Unsure**	**If Yes** If the impact is positive, consider developing commercialisation materials for sharing with stakeholders. If negative, reflect on the results and use it as a learning opportunity for future commercialisation projects. Often our biggest successes come from lessons learnt from previous attempts. **If No or Unsure** Go to the supporting tool to help you engage an impact evaluation specialist to undertake an impact evaluation to understand the intended and unintended impacts your technology solution on society, the economy and the environment: **Impact evaluation guide** *https://commercialisationplus.org/resources/tools/9a/* *Note:* *If the product has just become available on the market, evidence for impact will not yet available. So we suggest you reassess this question in a year.*

Readiness check	Actions
Do your key stakeholders agree to an evaluation being done and are they willing to contribute data? ◯ Yes ◯ No ◯ Unsure ◯ Not Applicable	 **If Yes** Go to the supporting tool to help you engage an impact evaluation specialist to undertake an impact evaluation to understand the intended and unintended impacts of your technology solution on society, the economy and the environment: **Impact evaluation guide** *https://commercialisationplus.org/resources/tools/9a/*  **If Unsure** Contact the key stakeholders in your technology solution project to discuss the “pros” and “cons” of conducting an impact assessment, including their willingness to contribute data.  **If No or Not Applicable** No further action required. You cannot complete an impact evaluation for this technology.

IP Protection

Ensuring appropriate protections are in place to underpin your commercial pathway

IP Protection Readiness

Intellectual Property (IP) can be described largely as an economic development tool. In other words, IP is a tool that aims to generate financial revenue for its immediate stakeholders and, more broadly, economic development for the community at large. Consequently, an economic return on investment assessment can be a useful way to assess and share the economic return on your investment with key stakeholders. The result of this assessment is something that many investors, including the government, are interested in receiving.

Therefore, the *IP Protection Readiness* question in this step focuses on understanding the return on investment that your commercialised technology solution has delivered.

Readiness check	Actions
Do you know what the amount of financial return will be in exchange for your IP *(i.e. payment)* for your organisation and your customer? ○ **Yes** ○ **No** ○ **Unsure**	**If Yes** No further action required. **If No or Unsure** Go to the supporting tool to help you engage a specialist, to undertake a cost benefit assessment of your technology to determine the economic impact: **Cost Benefit Analysis (CBA) guide** *https://commercialisationplus.org/resources/tools/9b/*

Market/End user

Engaging with people who will potentially benefit from using your technology solution

Market/End user Readiness

Capturing insights and reflections from end users about the impact or change your technology has had on their business and/or lives can provide important evidence for impact evaluations and help you share your success with potential future customers. Therefore the *Market/End user Readiness* focus for this step is on capturing stories from the end users/beneficiaries in an open and impartial way. It is good practice to capture both intended and unintended outcomes, both positive and negative, and contributions to bigger sustainable development impacts.

Readiness check	Actions
Have you reflected with the end users on benefits and changes (both intended and unintended)? ◯ **Yes** ◯ **No** ◯ **Unsure**	**If Yes** Use this information to inform the impact evaluation. **If No or Unsure** Go to the supporting tool and work with your customer/client to collect stories from end users about how the technology has effected them. **Beneficiary Change stories guide** *https://commercialisationplus.org/resources/tools/9c/*

Relationships & Network Readiness

As discussed in Phase A of this guide, a key element to successful Commercialisation PLUS outcomes is strong relationships and networks. Therefore, in this last step, the focus of *Relationships & Networks Readiness* is on the evolution of these relationships and building an evidence base that can be used to support impact evaluation. In addition, this is useful to support any longer-term relationship management strategies for different customers/clients and other partners you may wish to develop with your Technology Transfer Office regarding strengthening your commercialisation PLUS approach and outcome.

Readiness check	Actions
Have additional research and commercialisation relationships been created through the commercialisation of your technology solution? ○ **Yes** ○ **No**	**If Yes** Discuss and document any commercialisation relationships that have been created including revenue generated and impact, if possible, to help inform the impact evaluation and repeat any relevant steps for these technology solutions. **If No** No further action required.

A snapshot from Commercialisation PLUS practice

Nguyen Khoi Green Joint Stock Company:
Expanding sustainable approaches for premium pork

Featuring a new circular economy approach for organic pig farming which can recycle waste into household biogas, water for crops, produces earthworms for soil health, and grows pig feed while offering a high value product for a growing domestic market.

Ms. Nguyen Phuong Thao, co-founder of Nguyen Khoi Xanh Joint Stock Company, explains the strategic benefits of conducting an impact assessment on their technology solution. The assessment demonstrated that their innovative farming model has contributed to sustainable development while enhancing opportunities for the company and reinforcing their reputation for quality products.

To hear more from the researcher go to:
https://commercialisationplus.org/resources/video-library/

Thanks to:

Ms Nguyen Phuong Thao
Deputy Director, Nguyen Khoi Green Joint Stock Company

https://nguyenkhoifarm.com

Chapter four

Supporting tools

Introduction

This chapter is a convenient index of the various tools which will help you make decisions throughout your commercialisation journey to discover, refine, validate, execute, and evaluate your Commercialisation PLUS process and results (as described in Chapter 3).

Phase A: Building your commercialisation foundation through market discovery
(i.e. proving the commercial potential of your solutions)

Step 1:
Checking the Commercialisation PLUS options for your technology solution

Relevant readiness capability category:

Technology
Informing your technology development with market needs

Tool: **Technology Readiness for Commercialisation Check**

Description: This tool will help you assess whether your technology solution is sufficiently developed to initiate commercialisation. It uses the Technology Readiness Levels (TRL), which were originally created by NASA in the 1970s to assess the development of technology solutions against nine 'Technology Readiness Levels'. Understanding the development level (or TRL) of your idea/technology solution will help you decide if it is ready to begin the Commercialisation PLUS process.

Link to access tool: https://commercialisationplus.org/resources/tools/1a/

Relevant readiness capability category:

IP Protection
Ensuring appropriate protections are in place to underpin your commercial pathway

Tool: **Guide to 'State of the Art' searching**

Description: To help you determine if your technology has commercialisation potential, use this tool for guidance to search for ideas that have already been publicly disclosed and therefore are not "new" or "novel". Once you (or someone else) have publicly disclosed research results, the ability to protect the idea is greatly reduced and the commercialisation pathways available are generally more limited. This is important to understand before starting your Commercialisation PLUS journey.

Link to access tool: https://commercialisationplus.org/resources/tools/1b/

Step 2:
Refining your understanding of the market problems that your solution is addressing

Tool: **Market Discovery Guide tool**

Description: This tool provides guidance to understand the market system into which your technology solution will be applied. The different parts of the tool will help you ensure that your technology solution meets the needs and different perspectives of the people who will use it *(i.e. end users)* and those who will buy it *(i.e. customers)* as well as other key actors within it the market system.

Link to access tool: https://commercialisationplus.org/resources/tools/2a/

Relevant readiness capability category:

Market/End user
Engaging with people who will potentially benefit from using your technology solution

Tool: **Part A of Market Discovery Guide tool – Identifying Market Sectors**

Description: Part A is a brainstorming activity to help you to identify which sectors and markets your technology could benefit.

Link to access tool: https://commercialisationplus.org/resources/tools/2a/a/

Relevant readiness capability category:

Impact
Defining and measuring the impact and scale on society, the environment & the economy from your technology solution

Tool: **Part B of Market Discovery Guide tool – Mapping the Value Chain**

Description: Part B is a tool to help you visualise and outline the value chain that your technology solution will most likely use to reach the market.

Link to access tool: https://commercialisationplus.org/resources/tools/2a/b/

Relevant readiness capability category:

Relationships & Network
Developing networks & building relationships with value chain actors & other stakeholders to help identify & manage opportunities

Tool: **Part C of Market Discovery Guide tool – Mapping your networks and relationships**

Description: Part C is a mapping activity. You will identify the professional and personal networks of you and your team to discover the connections to the value chain that you have identified in Part B. This exercise will help enable market discovery discussions.

Link to access tool: https://commercialisationplus.org/resources/tools/2a/c/

Relevant readiness capability category:

Customer/Client
Engaging with people who are willing to pay for your technology solution

Tool: **Part D of Market Discovery Guide tool –**
A guide to exploring the market discussions

Description: Part D is a list of questions to help you understand the needs, challenges and opportunities from a market perspective. This tool will also provide guidance to analyse the responses you have received to understand whether there is a real market opportunity, or if there is interest in collaborating or buying your technology. Your subsequent discussions will be informed by the problems faced by the end user and the ability of your technology solution to solve them, as well as by identifying the main trends within the sector and the wider sector trends and opportunities that your technology may support.

Link to access tool: https://commercialisationplus.org/resources/tools/2a/d/

Relevant readiness capability category:

Impact
Defining and measuring the impact and scale on society, the environment & the economy from your technology solution

Tool: **Triple Bottom Line (TBL) Impact worksheet**

Description: This tool will help you brainstorm possible social, economic and environmental benefits to which your research will contribute, as well as any potential negative impacts.

Link to access tool: https://commercialisationplus.org/resources/tools/2b/

Step 3:
Considering your legal and regulatory obligations to protect your Intellectual Property (IP) and legally launching in the market.

Relevant readiness capability category:

IP Protection
Ensuring appropriate protections are in place to underpin your commercial pathway

Tool: **Patentability/Novelty Search Guide**

Description: By answering the question "*What patent protection has been done before?*", this tool provides guidance to verify the originality of the invention/technology solution, which then determines the novelty or newness of the underpinning intellectual property.

Link to access tool: https://commercialisationplus.org/resources/tools/3a/

Relevant readiness capability category:

IP Protection
Ensuring appropriate protections are in place to underpin your commercial pathway

Tool: **Pre-IP disclosure form**

Description: This tool will help you summarise information relating to the confidential and potential intellectual property underpinning your technology solution, including both the IP that you have created and any relevant prior art and competing art uncovered as part of IP searches that you have completed. The completed form will contain a description of what is new or novel, the problem it helps solve, and its advantages and benefits over existing technologies. Documenting this information is a useful reference when consulting with intellectual property experts within or outside of your university or research organisation.

Link to access tool: https://commercialisationplus.org/resources/tools/3b/

Relevant readiness capability category:

IP Protection
Ensuring appropriate protections are in place to underpin your commercial pathway

Tool: **Regulation support contacts list**

Description: This tool is a quick reference list of contact details for key organisations that can provide advice and help you consider all the relevant laws and regulations associated with commercialising your technology solution in Viet Nam.

Link to access tool: https://commercialisationplus.org/resources/tools/3c/

Phase B: Defining your value and planning your market strategy
(i.e. planning to launch your technology solution in the market)

Step 4:
Defining and validating the value of your technology solution in the market

Tool: **Value Proposition**

Description: This tool will help you identify the key elements of a value proposition and provide prompts to create a clear statement that communicates the key features and benefits of your technology solution for endorsement by potential end users, customers and industry associations.

Relevant readiness capability category:

Market/End user
Engaging with people who will potentially benefit from using your technology solution

Tool: **Part A of Value Proposition – Understanding your value proposition**

Description: Part A specifically helps you to explore and integrate end user wants, needs and challenges to assist you with the way you communicate the value of your technology to potential customers.

Link to access tool: https://commercialisationplus.org/resources/tools/4b/a/

Relevant readiness capability category:

Customer/Client
Engaging with people who are willing to pay for your technology solution

Tool: **Part B of Value Proposition –**
Writing and validating your value proposition statement

Description: Part B will guide you on writing simple statements that highlight the value of your technology to the market/end user and potential customers.

Link to access tool: https://commercialisationplus.org/resources/tools/4b/b/

Relevant readiness capability category:

IP Protection
Ensuring appropriate protections are in place to underpin your commercial pathway

Tool: **Confidentiality guide**

Description: This tool will help you decide if you need a non-disclosure agreement or a material transfer agreement, or both, when dealing with a potential client. To support trusting and productive relationships, confidentiality may need to be made explicit. This will ensure novel ideas and sensitive and/or restricted information remains secret to protect the interest of all collaborators/partners.

Link to access tool: https://commercialisationplus.org/resources/tools/4c/

Relevant readiness capability category:

Technology
Informing your technology development with market needs

Tool: **Technology solution information card template**

Description: This tool provides a template that will help you introduce people to your technology and to facilitate a conversation about needs, challenges, and innovation opportunities. The tool guides you to concisely and creatively present information about your technology solution to a non-scientific audience.

Link to access tool: https://commercialisationplus.org/resources/tools/4d/

Relevant readiness capability category:

Relationships & Network
Developing networks & building relationships with value chain actors & other stakeholders to help identify & manage opportunities

Tool: **Capability statement guide**

Description: By following this guide you will be able to present and communicate the knowledge, skills and experience of your research team. This tool will therefore help you facilitate conversations with existing and potential customers/clients about the breadth of capabilities and expertise of your research team.

Link to access tool: https://commercialisationplus.org/resources/tools/4e/

Tool: **Guide to Impact planning**

Description: This tool provides you with a framework for planning and monitoring your technology solution's path to impact.

Relevant readiness capability category:

Impact
Defining and measuring the impact and scale on society, the environment & the economy from your technology solution

Tool: **Part A of Guide to Impact planning – Impact pathway**

Description: Part A is a roadmap to help you think through the potential different pathways to impact. This includes highlighting the benefits for various users across the value chain, such as any underlying assumptions and potential risks that could influence the realisation of these benefits and ultimate impact.

Link to access tool: https://commercialisationplus.org/resources/tools/4a/a/

Relevant readiness capability category:

Impact
Defining and measuring the impact and scale on society, the environment & the economy from your technology solution

Tool: **Part B of Guide to Impact planning – Impact tracking indicators**

Description: Part B is a tool to help you identify indicators that will provide feedback on your progress towards your path to impact.

Link to access tool: https://commercialisationplus.org/resources/tools/4a/b/

Step 5:
Deciding upon and getting approval for your Commercialisation PLUS strategy

Relevant readiness capability category:

Market/End user
Engaging with people who will potentially benefit from using your technology solution

Tool: **Commercialisation Pathway Selector**

Description: This tool uses four decision making criteria to guide you on which commercialisation pathways best suits your technology solution. These criteria are:

1. the potential customer/client,
2. the market conditions/market barriers,
3. the technology uptake conditions/adoption barriers, and
4. the potential market reach of your technology solution.

Link to access tool: https://commercialisationplus.org/resources/tools/5a/

Relevant readiness capability category:

Market/End user
Engaging with people who will potentially benefit from using your technology solution

Impact
Defining and measuring the impact and scale on society, the environment & the economy from your technology solution

Tool: **Commercialisation PLUS Strategy guide**

Description: This tool provides a framework for consolidating important information into a plan which can be shared with key stakeholders and decision makers to explain how you will transfer your technology into the market.

Link to access tool: https://commercialisationplus.org/resources/tools/5c/

Tool: **Partnership Guide**

Description: This guide provides you with tools to build effective collaborations by using a framework that ensures mutual benefit, trust, transparency and accountability. The collaborations that you build will be reinforced by addressing complementarity, risk sharing, innovating, shared learning and reaching scale.

Relevant readiness capability category:

Relationships & Network
Developing networks & building relationships with value chain actors & other stakeholders to help identify & manage opportunities

Tool: **Part A – Partner selector**

Description: Part A is an assessment tool to help you determine with whom you should partner, your shared and individual goals, and to what degree they would be a good potential partner.

Link to access tool: https://commercialisationplus.org/resources/tools/5d/a/

Step 6:
Validating your Commercialisation PLUS strategy with the potential customers

Relevant readiness capability category:

Technology
Informing your technology development with market needs

Tool: **Tips for discussing your technology solution without giving away IP secrets**

Description: This tool shares tips and tricks to help you feel more confident discussing your technology solution without disclosing any commercial in-confidence information and/or intellectual property with potential customers/clients, end users and other interested stakeholders.

Link to access tool: https://commercialisationplus.org/resources/tools/6b/

Relevant readiness capability category:

Market/End user
Engaging with people who will potentially benefit from using your technology solution

Tool: **Marketing specialist Terms of Reference guide**

Description: This tool guides you on developing a Terms of Reference for a Marketing specialist to help validate and implementation your Commercialisation PLUS strategy.

Link to access tool: https://commercialisationplus.org/resources/tools/6c/

Tool: **Partnership Guide**

Description: This guide provides you with tools to build effective collaborations by using a framework that ensures mutual benefit, trust, transparency and accountability. The collaborations that you build will be reinforced by addressing complementarity, risk sharing, innovating, shared learning and reaching scale.

Relevant readiness capability category:

Relationships & Network
Developing networks & building relationships with value chain actors & other stakeholders to help identify & manage opportunities

Tool: **Part B – Preparing to partner**

Description: Part B is a tool to 1) brainstorm and map partner contributions and to 2) undertake a risk assessment for open, transparent, and equitable discussions with collaborators around risks associated with partnering and how to manage these risks.

Link to access tool: https://commercialisationplus.org/resources/tools/5d/b/

Phase C: Implementing & managing your strategy for impact

(i.e. launching your technology solution into the market and managing for impact & scale)

Step 7:
Executing your Commercialisation PLUS strategy, including sourcing resources and negotiating conditions for use of your technology solution

Relevant readiness capability category:

Market/End user

Engaging with people who will potentially benefit from using your technology solution

Tool: **Pitch development guide**

Description: This tool guides you through the key elements of developing a "pitch" for potential customers, investors etc. The framework in this tool will help you develop clear and concise messages that communicate the value of your technology solution to your intended target audience.

Link to access tool: https://commercialisationplus.org/resources/tools/7a/

Relevant readiness capability category:

Customer/Client

Engaging with people who are willing to pay for your technology solution

Tool: **A guide to interest-based negotiation**

Description: This tool uses interest-based negotiation as an approach to guide you on how to reach a mutually acceptable outcome for all parties involved rather one party imposing their position upon the other.

Link to access tool: https://commercialisationplus.org/resources/tools/7b/

Tool: **Partnership Guide**

Description: This guide provides you with tools to build effective collaborations by using a framework that ensures mutual benefit, trust, transparency and accountability. The collaborations that you build will be reinforced by addressing complementarity, risk sharing, innovating, shared learning and reaching scale.

Relevant readiness capability category:

Relationships & Network
Developing networks & building relationships with value chain actors & other stakeholders to help identify & manage opportunities

Tool: **Part C – Developing a partnership agreement**

Description: Part C is a template outlining the aspects you will need to discuss and develop with potential partners which will form the basis of a partnership agreement. These include agreed upon shared and individual goals, governance structure and partnership management, communications, and dispute resolution.

Link to access tool: https://commercialisationplus.org/resources/tools/5d/c/

Step 8:
Managing your Commercialisation PLUS relationships to ensure that your strategy is executed, and new opportunities are optimised

Relevant readiness capability category:

Impact
Defining and measuring the impact and scale on society, the environment & the economy from your technology solution

Tool: **Impact data guide**

Description: This tool helps you identify and collect key information needed to assess the changes *(i.e. outcomes and impacts)* your technology solution is contributing to society *(e.g. social, economic and environmental changes).*

Link to access tool: https://commercialisationplus.org/resources/tools/8a

Relevant readiness capability category:

Impact
Defining and measuring the impact and scale on society, the environment & the economy from your technology solution

Tool: **Customer case study guide**

Description: This tool will provide you with a structure to help you communicate the value that your technology solution can add to customers. By sharing a real-life example from an established customer, you can demonstrate the challenge that was addressed and the solution and benefits offered by your technology solution.

Link to access tool: https://commercialisationplus.org/resources/tools/8b/

Relevant readiness capability category:

Customer/Client
Engaging with people who are willing to pay for your technology solution

Tool: **Capability statement guide**

Description: This tool will help you facilitate conversations with existing and potential customers/clients and to specifically highlight how you can help them. In this case, you will focus on communicating your research team's knowledge, skills and experience by using a format that is highly visual and easy to read.

Link to access tool: https://commercialisationplus.org/resources/tools/4e/

Tool: **Partnership Guide**

Description: This guide provides you with tools to build effective collaborations by using a framework that ensures mutual benefit, trust, transparency and accountability. The collaborations that you build will be reinforced by addressing complementarity, risk sharing, innovating, shared learning and reaching scale.

Relevant readiness capability category:

Relationships & Network
Developing networks & building relationships with value chain actors & other stakeholders to help identify & manage opportunities

Tool: **Part D – Partnership review**

Description: Part D is a checklist to support discussions around the "health" of your collaborations with your customer and other partners, as well as to manage challenges early and identify success stories.

Link to access tool: https://commercialisationplus.org/resources/tools/5d/d/

Step 9:
Evaluating the contribution of your technology solution to sustainable development impacts (social, environmental, and economic)

Relevant readiness capability category:

Impact
Defining and measuring the impact and scale on society, the environment & the economy from your technology solution

Tool: **Impact evaluation guide**

Description: This tool guides you through an impact evaluation to assess the evidence to determine the impacts that have occurred and the contribution or net effects your commercialised technology solution has made towards sustainable development *(i.e. social, economic and environmental changes)*.

Link to access tool: https://commercialisationplus.org/resources/tools/9a/

Relevant readiness capability category:

IP Protection
Ensuring appropriate protections are in place to underpin your commercial pathway

Tool: **Cost Benefit Analysis (CBA) guide**

Description: This tool guides you through a cost benefit assessment to determine the economic return that your technology solution has contributed to the economy. You can share this with key stakeholders and use it to demonstrate the value of your technology to the economy more broadly.

Link to access tool: https://commercialisationplus.org/resources/tools/9b/

Relevant readiness capability category:

Market/End user
Engaging with people who will potentially benefit from using your technology solution

Tool: **Beneficiary change story guide**

Description: This tool will guide you through the development of a beneficiary change story to you help communicate the impact and value that your technology can create for different industries.

Link to access tool: https://commercialisationplus.org/resources/tools/9c/