



Best practices on Technology Transfer **Innovation Potential of EST**

The European Solar Telescope (EST) is a revolutionary project aimed at the design, construction and operation of a 4-meter class solar telescope. EST will contribute to maintain Europe at the frontier of solar physics research, while at the same time will mobilise European industry to fully participate in the technological challenges to be faced up in the next decade. EST will specialise in high spatial and temporal resolution using a number of instruments that can efficiently produce two-dimensional spectral information. Achieve these goals will require the development of breakthrough technologies that punctually may be translated in new innovations with possible applications beyond astronomy, as medicine or aeronautic industry. An improved capacity for innovation potential, through developing of a dynamic attitude between the EST partners, will ensure a significantly higher level of translational research from national and EU funded research programmes, while the most promising projects with measurable high potential for benefit to society and for socio-economic development should be promoted ensuring appropriate support in IPR management, technology transfer and strategy.

Although, each EST partner has probably its Technology Transfer Office (TTO), or similar, the EST Project Office has prepared this guideline for inventors that outlines the essential best practice in knowledge transfer, in order to raise awareness of the importance of innovation and the intellectual property rights in the development of singular research infrastructure.

The guide is organized to answer the most common questions of the research community and designed to provide a broad overview of the knowledge transfer process. For more information, we encourage you to contact either your TTO or the EST Project Office.



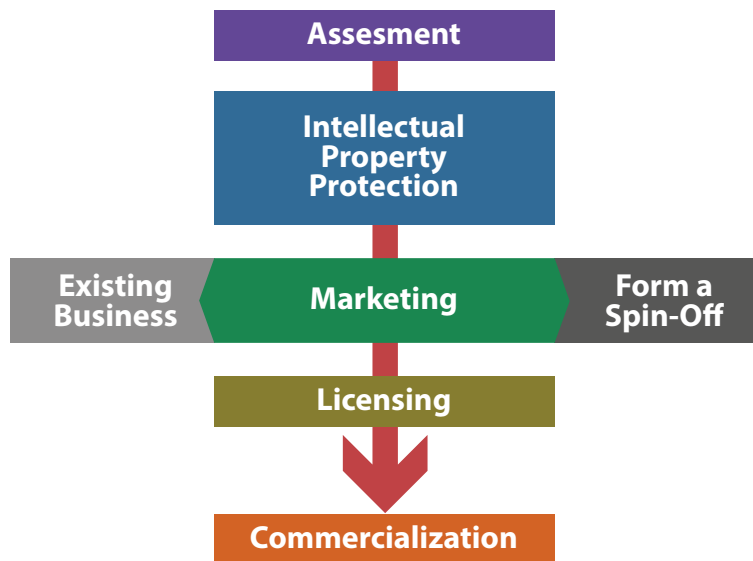
Knowledge transfer occurs in many ways: through research publications, exchanges at scientific conferences, and informal and formal relationships with industry. Most importantly, knowledge transfer occurs via educated students entering the workforce. For the purposes of this guide, however, knowledge transfer refers to the formal licensing of technology and intellectual property rights (IPR) to third parties. Your TTO, helps you to transform your inventions into a new product and services that improve our quality of life, by:

- ◆ Evaluating promising technologies generated by the researchers.
- ◆ Promoting them into industrial sector.
- ◆ Negotiating license agreements with the interested companies.
- ◆ Maintaining long-term relationships with the companies developing products based on the licensed.



The Knowledge Transfer Process

Generally speaking, the technology transfer process can be conceptualized as a continuous cycle where research activities lead to discoveries and inventions that can be converted to licensed products in the marketplace. The revenues received from licensees, and through other knowledge transfer mechanisms, will potentially be reinvested to foster the creation of the next generation of research and innovators. The following sections explain the key phases of this process that start with the research activity and finish with the potential reinvestment of the revenues of the licensed technologies.



This information is based on AUTM's "Inventor's Guide to Technology Transfer" and IPRHelpdesk best practices, with adaptations for EST Project Office.

1. Assessment an Invention Disclosure

The technology transfer process begins with the assessment of the invention disclosure. This written notice is a confidential document, and should fully describe the new aspects of your invention, including the critical solution it provides and its advantages and benefits over current technologies. Then, the TTO will review the invention disclosure, conduct patent searches (if applicable), and analyse the market and competitive technologies to assess the invention's commercialization potential.

2. Intellectual Property Protection

Patent protection, a common legal protection method, begins with the filing of a patent application in your national Patent and Trademark Office and, when appropriate, foreign patent offices. Other commonly used forms of intellectual property protection include copyright and trademark. Unique software can often be successfully licensed without formal intellectual property protection.

3. Marketing

All TTOs are committed to broadly marketing all technologies to appropriate companies that could be interested in commercializing the particular invention. With your input, TTO will create a marketing overview of the technology, and identify and contact candidate companies (potential licensees) that have the expertise, resources, and business networks to bring the technology to market. If creation of a spin-off appears as the optimal commercialisation path, your TTO will assist the founders in planning, creating and finding funding for the spin-off.

4. Licensing

The TTO negotiates and executes a license agreement. This agreement is a contract between the research centre and a company in which certain rights to a technology are granted to a company in return for financial and other benefits. An option agreement is sometimes used to allow a company to evaluate the technology for a limited time before a formal license agreement is concluded.

5. Commercialisation

Most inventions from research centres are very early stage and require further research and development efforts. The licensee company typically makes significant business investments of time and funding to commercialize the product or service. This step may entail regulatory approvals, sales and marketing, support, training, and other activities.





What is an invention disclosure?

An invention disclosure is a written description of your invention. The disclosure lists all sources of support and includes information necessary to begin pursuing protection and commercialization activities. If available, copies of the prior art (e.g., publications and prior patents) should be provided. The inventor should describe in detail the differences between the invention and the prior art as well as the advantages of the new development as technical or economic benefits or solutions to meaningful, previously unsolved problems.

When should I complete an invention disclosure?

You should complete an invention disclosure whenever you feel you have discovered something unique with possible commercial value or when the terms of your sponsored research require disclosure of inventions. If you are in doubt, do not hesitate to contact your TTO to discuss your invention.

How do I submit an invention disclosure?

To initiate the process, please send the invention disclosure to your TTO, which should be treated as confidential. You will usually be contacted shortly after your submission to discuss the invention and its potential commercial applications.

How does TTO assess invention and technology disclosures?

The TTO examines each invention disclosure to analyse the licensability of an invention. Factors in the evaluation include: the patentability of the invention, protectability and marketability of potential products or services, relationship to related intellectual property which may affect freedom to operate, size and growth potential of the relevant market, amount of time and money required for further development, pre-existing rights (also known as “background rights”) associated with the intellectual property, and potential competition from other products/technologies.

What if I created the invention with someone from another institution or company?

If you created the invention under a contract or consulting agreement with a company, the TTO licensing manager will need to review that contract to determine ownership and other rights associated with the contract, and to determine the appropriate next steps. Should the technology be jointly owned, TTO will work with other organizations under “inter-institutional” agreements that provide for one of the institutions to take the lead in protecting and licensing the invention, sharing of expenses associated with the patenting process, and allocating any licensing revenues.



Please inform to your TTO well before of any planned publications. Note once publicly disclosed (i.e., published or presented in some written form), an invention may have restricted or minimal potential for patent protection. Be sure to inform the TTO of any imminent or prior presentation, lecture, poster, abstract, website description, research proposal, dissertation/master’s thesis, publication, or other public presentation of the invention.

What is intellectual property?

Intellectual property is inventions and/or material that may be protected under the patent, trademark and/or copyright laws. In particular, an invention can be patented if fulfil the following conditions:

◆ Novelty

In patent law, an invention is considered to be new if it does not form part of the 'state of the art' the day on which the patent application was filed. 'State of the art' includes everything that has been publicly disclosed, no matter how or in what form.

◆ Inventive step

This is judged compared to what could reasonably be achieved by a specialist of average talent who has access to all published material in the field and who possesses good specialist knowledge and craftsmanship without being a leading authority.

◆ Industrial applicability

An invention is usually industrially applicable when it can find an application or manufacture in trade or industry including agriculture at the time of filing.

Who owns what I create?

Ownership depends mainly upon the employment status of the inventor. As a general rule, your institution owns inventions made by its employees while working under a grant or contract to your institution or using its resources.

Note that all contributors to the ideas leading to a discovery should be mentioned in your disclosure, even if they do not belong to your institution. When in doubt, it is best to contact the TTO for further advice.

What is the definition of an inventor?

An inventor is that person who conceives of an essential element of the invention as described in the patent claims of a patentable invention. The inventorship of a patent application may change as the patent claims are changed during prosecution of the application. A person who contributed only labour and/or the supervision of routine techniques or does all the experiments with direction from another person, but who did not contribute to the concept of one of the embodiments of the claimed invention, is not considered an inventor.

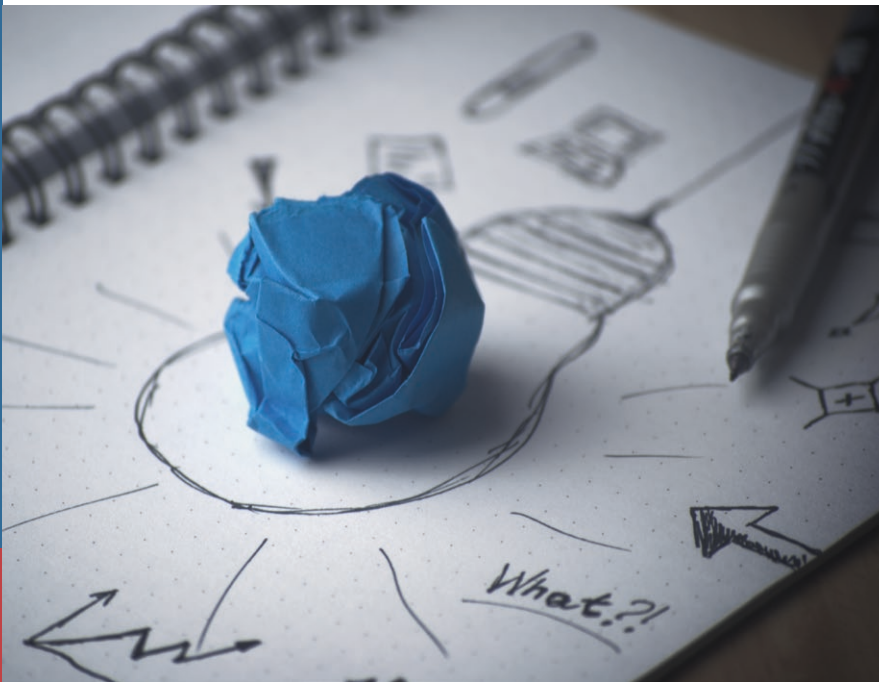
Who is responsible for patenting?

In general, TTO usually contracts with outside patent counsel for IP protection, thus assuring access to patent specialists in diverse technology areas. Inventors work with the patent counsel in drafting the patent applications and responses to worldwide patent offices. The TTO will help with the selection and oversight of the outside patent counsel.

Why does your TTO protect some intellectual property through patenting?

Patent protection is often a requirement of a potential commercialization partner (licensee) because it can protect the investment required to bring the technology to market.

Due to their expense, patent applications are not possible for all intellectual property of the institution. Thus, the TTO carefully review the commercial potential for an invention before investing in the patent process. However, because the need for commencing a patent filing sometimes precedes finding a licensee, TTO may look



for creative and cost-effective ways to seek early protections for as many promising inventions as possible.

Who decides what gets protected?

The TTO and the inventor(s) consider relevant factors in making recommendations about filing patent applications. Ultimately, the TTO makes the final decision as to whether to file a patent application or seek another form of protection. The critical parameters determining whether or not to file a patent application to protect an invention can be summarised as follows:

- ◆ is the invention exploitable
- ◆ if yes, is patent protection necessary for exploitation of the invention
- ◆ if yes, is the invention patentable (novel, inventive, industrially applicable)
- ◆ if yes, is there sufficient enablement at the time of disclosure to your institution or does the invention require further exemplification prior to filing.

What if I created the invention with someone from another institution or company?

Generally, the invention will be jointly owned between your TTO and the other institution or company. Each inventor will assign his or her

rights to their employer. Your institute TTO will work with the other institution to decide on management of the invention. Usually, if the other institution is a university or research institution, the TTO will make an “inter-institutional” agreement that provides for one of the institutions to take the lead in protecting and licensing the invention, sharing of expenses associated with the patenting process and allocating any licensing revenues.

Do I need to protect my results in EU projects?

As far as the protection and exploitation of the knowledge generated by EU projects is concerned, all beneficiaries (contractors) have an obligation:

- ◆ to protect the results if they are capable of industrial or commercial exploitation.
- ◆ to use/exploit the results they generate, either for further research, commercial purposes or by establishing licensing deals/partnerships to allow exploitation by other entities.
- ◆ to disseminate the results they own as soon as possible and by appropriate means.



How does the TTO market my inventions?

The TTO is committed to finding the best licensee for the technology – a company that will dedicate resources (time, money, and people) to developing the technology. A licensing specialist will use many sources and strategies to identify potential licensees and market inventions.

Existing relationships of the inventors, the TTO staff, and other researchers are useful in marketing an invention. Market research can also assist in identifying prospective licensees. In addition, we also examine other complementary technologies and agreements to assist our efforts. Faculty publications and presentations are often excellent marketing tools as well.

How long does it take to find a potential licensee?

It can take months and sometimes years to locate a potential licensee, depending on the attractiveness of the invention, its stage of development, and the size and intensity of the market. Most inventions tend to be in the early stage in the development cycle and thus require substantial commercialization investment, making it more difficult to attract a licensee. The TTO will follow the contacts and negotiations with the industry in order to decide the maintaining of the patent invention.

How can I assist in marketing my invention?

Studies have shown that 70% of licensees were known to the inventors. So, your active involvement can dramatically improve the chances of matching an invention to an outside company. Your research and consulting relationships are often helpful in both identifying potential licensees and technology champions within those companies. Once interested companies are identified, the inventor is the best person to describe the details of the invention and its technical advantages. The most successful tech transfer results are obtained when the inventor and the licensing professional work together as a team to market and sell the technology.

Can there be more than one licensee?

Yes, an invention can be licensed to multiple licensees, either non-exclusively to several companies or exclusively to several

companies, each only for a unique field-of-use (application) or geography.

Will the TTO license to my spin-off?

A spin-off is a new business entity formed by members of the research group to commercialize one or more related intellectual properties. From a technology transfer perspective, the spin-off company with an entrepreneur committed to developing a particular technology may be the best licensee, but the spin-off company must offer a viable plan to commercialize an invention in order to receive a license. If a new business spin-off is the best choice for commercializing the technology, the TTO should negotiate with a representative of the company to grant a license to the new company. If the spin-off has personnel associated with the research centre, the company representative should not be an employee of the institution, in order to mitigate against conflicts of interest.



What is a spin-off?

A spin-off is a new business entity formed by entrepreneurs to commercialize one or more related intellectual properties. The creation of spin-off companies is one of the knowledge transfer paths through knowledge and/or intellectual property are transferred. This implies that the economic activity of a spin-off company is based on scientific knowledge or technological know-how developed within the research centre. The spin-off company translates these research results in commercial products and/or services.

What are the key factors when considering a spin-off?

Undertaking commercialisation activities via a spin-off company will transfer the responsibilities and risks into the spin-off. The company will also need to attract new sources of funding for further

development of the IP asset by offering to issue shares to potential investors in the spin-off. A few key factors when considering a spin-off company are:

- ◆ Development risk – often large companies in established industries are unwilling to take the risk for unproven technology.
- ◆ Development costs versus investment return – because of the high risk of spin-off, investors will consider the potential to obtain many multiples of return before committing funds to a new company.
- ◆ Platform technology – few companies survive on one product alone; technologies that can be commercialized for multiple products or services are more likely to enable successful spin-off.
- ◆ Competitive advantage and target market – these must be sufficiently large to succeed.
- ◆ Potential revenues – this must be sufficient to grow and sustain a company.



What is the procedure to start a spin-off company?

After a first informal contact with the TTO where the researcher briefly presents the innovation that forms the basis of the new company, your TTO will guide to the researcher in writing a sound business plan. This is an iterative process where the researcher writes the business plan and TTO gives feedback through a number of brainstorming sessions until the business focus is clearly defined and the financial planning is optimized.

Why do I have to write a business plan?

Writing a business plan forces the researcher to think about the business idea through systematically. An idea may sound great in your own mind, but when you perform a detailed market analysis and put down the details and numbers, you may be confronted with some problems. In general, a business plan serves two major purposes. First, it serves as a communication tool to attract and convince investors required for setting up and successfully developing a business. Second, once the company is started, the business plan should be used as a monitoring tool and control mechanism for the entrepreneurs themselves, to see whether business is developing the way as it was planned.

Where does the money needed for setting up a spin-off company come from?

Basically, the money needed for setting up a spin-off company can come from one or (usually) more of the following sources:

- ◆ the founders' personal financial resources,
- ◆ equity financing from angel and venture capital investors,
- ◆ bank financing (via loans, leases, etc.), or
- ◆ European, national and regional funding sources.

What is the relation between the new company and my institution after start-up?

By means of a technology transfer agreement, it is clearly defined which research results are transferred to the spin-off company, and which others remains in the research group(s). Very often the spin-off is also given a 'first right of refusal' on future results, within a certain time frame, to be obtained at market conditions. By means of a collaboration agreement, the commitment of the research group, both in terms of invested time and money, is determined. In the start-up phase, when the spin-off company is still very small, an arrangement can be made to rent a space and to get access to the necessary lab equipment and facilities. Nevertheless the company is urged to move as quickly as possible to a more appropriate location. Locating the company in one of the specialised incubators is, therefore, the next logical step



What is a license?

A license is permission granted by the owner of intellectual property that allows another party to act under all or some of the owner's rights, usually under a written license agreement.

What is a licence agreement?

A licence agreement is a contract under which the holder of intellectual property (licensor) grants permission for the use of its intellectual property to another person (licensee), within the limits set by the provisions of the contract. Without such an agreement, the use of the intellectual property would be an infringement. The license agreements usually stipulate that the licensee should diligently act to bring the intellectual property into commercial use for the public good and provide a reasonable economical return to the research centre.

What are the benefits and risk of licensing?

When negotiating a licence agreement, it is important to understand why companies license their intellectual property or wish to become a licensee, as well as the potential risks of entering in such deal. This will not only help you to grasp the motivations behind the demands of the other party, but also enable you to mitigate risks when drafting the licence agreement and very importantly, reach a "win-win" agreement.

What can I expect to gain if my IP is licensed?

A set share of any net financial return from a license is provided to the inventor(s). In addition, inventors enjoy the satisfaction of knowing their inventions are being deployed for the benefit of the general public. New and enhanced relationships with businesses are another outcome that can augment one's teaching, research and consulting.

What is the relationship between inventor and a licensee?

Most licensees require the active assistance of the inventor to facilitate their commercialization efforts. This can range from infrequent, informal contacts to a more formal consulting relationship. Working with a new business spin-off can require substantially more time, depending on your role in or with the company and your continuing role within your institution.

What other types of agreements and considerations apply to knowledge transfer?

Knowledge can be transferred through many mechanisms, such as through the publication of scientific articles, participation in conferences or the publication of patent applications. However, knowledge is often exchanged through contractual mechanisms, as license agreements, but many others are used to transfer knowledge and in particular technology. Understanding these different agreements is therefore important to help you in your own knowledge transfer activities.

◆ Confidentiality or Non-Disclosure Agreements

A confidentiality agreement is also known as a confidential disclosure agreement (CDA) or non-disclosure agreement (NDA). Confidentiality agreements are commonly entered into by parties considering doing business or committing to a form of collaboration with each other. This restricts the way in which the information shared is used, prevents dissemination, and maintains the option to protect it in the future.

◆ Material Transfer Agreements or Material Use Licences

MTA define rights and obligations when materials are transferred from one organisation to another. The materials will usually be used by the recipient organisation for research purposes only. For owners of materials MTA are of critical importance to control use of the transferred materials and set out the rights and obligations in relation to ownership of research results, confidentiality, publication and liability of the parties.

◆ Sponsored Research Agreements

This type of agreements describes the terms under which sponsors provide research support to your research centre, in order to achieve a specific objective. It is probably the most frequent form of industry-research institution collaboration. The research is generally aimed at solving a particular problem or fulfilling a particular need identified by the organisation. Research sponsorships are usually formalised in a written agreement specifying the organisation's requirements. Sponsored research agreements will commonly have a detailed project plan setting out the goals and expected deliverables for each project attached.



When is the IP ready for commercialization?

Ideally, technological and commercial merits of an organisation's IP are assessed at an early stage during the development of IP. However, not all IP created will be ready for commercialisation immediately and some IP may be created for use internally on an operational basis, which may not be suitable for commercialisation. There are a range of issues that need to be considered before commercialising an IP asset as: ownership and nature of IP, stage of development and potential infringement.

What activities occur during commercialization?

The signing of a License Agreement is usually the beginning of a long term relationship. Most licensees continue to develop an invention to enhance the technology, reduce risk, prove reliability, and satisfy the market requirements for adoption by customers. This can involve additional testing, prototyping for manufacturability,

durability and integrity, and further development to improve performance and other characteristics. Documentation for training, installation, and marketing is often created during this phase. Benchmarking tests are often required to demonstrate the product/service advantages and to position the product in the market. The licensee's performance is monitored by the licensing specialist for the duration of the license. Most License Agreements require periodic financial or development reports from the licensees.

What will happen to my invention if the spin-off company or licensee is unsuccessful?

Licenses typically include performance milestones that, if unmet, can result in termination. This allows for subsequent licensing to another business. However, time delays and other considerations can hinder this effort.

And last, what is my role?

- ◆ Contact your TTO when you believe you have a scientific result with potential commercial or research value.
- ◆ Complete and submit the Invention Disclosure before publicly disclosing your technology or submitting a manuscript for publication.
- ◆ To avoid risking your patent rights and possibly hindering the opportunity to market your invention, contact your TTO before holding any discussions with people outside your institution.
- ◆ On the Invention Disclosure Form, include companies and contacts you believe might be interested in your intellectual property or who may have already contacted you about your invention.
- ◆ Respond to TTO and outside patent counsel requests. While some aspects of the patent and licensing process will require significant participation on your part, the TTO will strive to make efficient use of your valuable time.
- ◆ Keep your TTO informed of upcoming publications or interactions with companies related to your invention as well as about significant technology developments.