



## Factsheets on IP management

Deliverable No.:	4.1
Project Acronym:	WASTE2H2
Full Title: Waste to Hydrogen	
Grant Agreement No.:	952593
Work package No.:	4
Work package Title: Knowledge Management and Science-Industry Rapprochement	
Responsible Author: Klas Engvall (KTH)	
Responsible Co-Authors:	
Date:	31.12.2022
Status:	Final
Dissemination level:	Confidential

## Abstract

Portugal has high a set goal to become carbon neutral in 2050. This includes keeping hydrogen as a central priority in the energy sector. Residues from forestry but also some agricultural residues, are of potential use as feedstocks for thermochemical conversion methods, particularly gasification, when gaseous energy carriers, such as hydrogen. Industrial implementation of new technology is therefore becoming more and more important, enforcing both a development of intellectual property management, and need for enhanced collaboration between industry and academia. This report describes the proposed strategy in form of proposed actions on how to improve knowledge and intellectual property management methodologies at IPP, and actions to be considered by IPP to enhance the waste to hydrogen development in particularly the Alentejo region in Portugal.

The Alentejo region has the potential to be a regional lead market in Portugal for sustainable technologies, such as gasification for production of hydrogen. This could be achieved by adopting a regional development strategy, focusing on gasification and other related technologies. Furthermore, to enable industrial and societal growth in Portalegre and its surrounding, it is important to establish an environment stimulating innovation, attracting talented people interested in developing new ideas from lab-to-innovation, progressing to start-ups. A prospective scenario of interactions between different entities and an aligned and reorganised IPP innovation and IP system is presented.

## Document History

Date	Version	Author(s)	Changes made
14-11-2022	1	Klas Engvall	1 <sup>st</sup> document draft
08-12-2022	2	Klas Engvall	2 <sup>nd</sup> document draft
27-12-2022	3	Klas Engvall	Final revisions
28-12-2022	4	Klas Engvall	Final formatting and editing

## Legal Disclaimer

WASTE2H2 has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 952593.

The sole responsibility for the content of this deliverable lies with the authors. It does not necessarily reflect the opinion of the European Union. The European Commission is not responsible for any use that may be made of the information contained therein. All images are provided by the respective partners (unless otherwise noted) and are approved for reproduction in this publication.

## Table of contents

Introduction.....	7
Factsheets.....	8
1. Changes and opportunities in industry activity.....	8
1.1. The Portuguese hydrogen strategy.....	8
1.2. Bio-based waste resources in Alentejo.....	9
1.2.1. Forest and agricultural waste resources.....	9
1.2.2. Municipal Solid Waste (MSW).....	9
1.3. Opportunities in Alentejo and Portalegre district.....	10
1.4. Proposed actions to consider for IPP to enhance the waste to hydrogen development.....	11
2. Changes and opportunities in the landscape surrounding the IP system.....	12
2.1. Present IPP Innovation and IP system.....	12
2.1.1. Summary of accessible information on the IPP webpage.....	12
2.1.2. Summary of roundtable discussion at IPP and analysis of the present IPP Innovation and IP system.....	13
2.2. Changes and opportunities developing the innovation and IP management system.....	14
3. Specific actions to be taken to improve IP management.....	17
4. Appendix 1.....	18

## Appendices

“Intellectual Property Regulation” (see Appendix 1, only in Portuguese online, but a translated version available for the analysis)

## List of Figures

Figure 1. The actual outline of organizational entities and interactions between researcher/student with the IPP. (1) IPPortalegre Research Policy - Programmatic Lines and (2) Intellectual Property Regulation..... 13

Figure 2. Flow chart of a potential innovation process including the IP system at IPP. .... 15

**List of Tables**

Table 1. Estimated amounts of biomass wastes available in Alentejo and Portugal ..... 9  
Table 2. Estimates of the potential of gasification-based hydrogen in Alentejo. .... 10  
Table 3. Proposed actions to improve IP management..... 17

## Introduction

This document presents the three factsheets related to Task 4.1 From the “Lab to the Market” in WP4 of the project. The industry has become ever more dependent on the creation and use of technology, increasingly intellectual property management issues arise, which demands a cooperative work and gaining new skills. To address this issue the partners of the project have prepared three factsheets elaborating on:

- i) Changes and opportunities in industry activity
- ii) Changes and opportunities in the landscape surrounding the IP system
- iii) Specific actions to be taken to improve IP management

The factsheets are detailed in the order as stated above.

# Factsheets

## 1. Changes and opportunities in industry activity

### 1.1. The Portuguese hydrogen strategy

As the first country in the world embracing the goal being carbon neutral in 2050, Portugal is striving at keeping hydrogen as a central priority in the energy sector. This is manifested in the “National Plan for Energy and Climate” (from the Portuguese Council of Ministers Resolution n° 53/2020) where new business opportunities for production of green hydrogen and other renewable gases is predicted as favourable<sup>1</sup>. In view of this, Portugal expects to produce 65 ktoe of hydrogen for the transport sector by 2030 production<sup>2</sup>. While the main source of green hydrogen is presumed to be produced by electrolysis using renewable electricity, also biomass gasification is identified as a relevant technology for production of green hydrogen in the “National Strategy for Hydrogen” (defined in the Portuguese Council of Ministers Resolution n° 63/2020)<sup>3</sup>. In the wake of the hydrogen strategy, several ventures oriented towards hydrogen production, such as the Nazare Green Hydrogen Valley (NGHV)<sup>4</sup>, GreenH2Atlantic<sup>5</sup> and Cascais Municipality<sup>6</sup> has been initiated.

Biomass is a renewable and thus a resource with different value chains competing and its use must therefore be sustainably, using a cascade concept and the principles of circular economy<sup>7</sup>. Residues from forestry are of particular importance but also some agricultural residues, such as cereal straw, olive pomace or orchard, and vineyard pruning residues and grape pomace, are of potential use. These feedstocks are preferably converted to useful energy carriers by means of thermochemical conversion methods, particularly gasification when gaseous energy carriers such as hydrogen is desired.<sup>8</sup> Other agricultural residues, such as animal manure, overall wastes from cattle, pig and poultry farms, or waste from the dairy industry, and wastewater sludges are used for production of biogas through anaerobic digestion. For these feedstocks thermochemical conversion is not applicable due to the high moisture content (<20%)<sup>9</sup>.

Alentejo corresponds to one-third of the surface of Portugal (26,931 km<sup>2</sup>) but is sparsely populated with around 7% of the national population<sup>10</sup>. Today, the region develops products of recognized world excellence such as cork, wine, and olive oil, is but is also well-positioned for expansion into new local niches of productive specialization. These products and their related industries present enormous potential for the development of bioeconomy systems and in view

<sup>1</sup> Presidency of the Council of Ministers, 2020c. Resolution of the Council of Ministers no 53/2020 - National Plan for Energy and Climate, Diário da República - I Série-B. Lisbon.

<sup>2</sup> Trinomics, 2020. Opportunities for Hydrogen Energy Technologies Considering the National Energy & Climate Plans. Rotterdam. <https://trinomics.eu/wp-content/uploads/2020/09/Final-Report-Hydrogen-in-NECPs.pdf>

<sup>3</sup> Presidency of the Council of Ministers, 2020a. Council of Ministers Resolution n.o 63/2020 - National Plan for Hydrogen, Diário da República. Lisbon.

<sup>4</sup> Nazare Green Hydrogen Valley. <https://www.nghv.pt/en>. Link accessed 29/11 2022.

<sup>5</sup> GreenH2Atlantic. <https://www.greenh2atlantic.com/>. Link accessed 29/11 2022.

<sup>6</sup> Running on rubbish, The Portugal News. <https://www.theportugalnews.com/news/2021-11-10/running-on-rubbish/63435>. Link accessed 29/11 2022.

<sup>7</sup> Presidency of the Council of Ministers, 2017a. Council of Ministers Resolution no 163/2017 - National Plan for the Promotion of Biorefineries, Diário da República. Lisbon.

<sup>8</sup> Binder, M., Kraussler, M., Kuba, M., Luisser, M., 2018. Hydrogen from biomass gasification. IEA Bioenergy, [https://www.ieabioenergy.com/wp-content/uploads/2019/01/Wasserstoffstudie\\_IEA-final.pdf](https://www.ieabioenergy.com/wp-content/uploads/2019/01/Wasserstoffstudie_IEA-final.pdf)

<sup>9</sup> Fytili, D., Zabaniotou, A., 2018a. Circular Economy Synergistic Opportunities of Decentralized Thermochemical Systems for Bioenergy and Biochar Production Fueled with Agro-industrial Wastes with Environmental Sustainability and Social Acceptance: a Review. Current Sustainable/Renewable Energy Reports 5, 150–155. <https://doi.org/10.1007/s40518-018-0109-5>

<sup>10</sup> Carmo, A., Rêgo, P., 2020. Covid-19 In Alentejo: Brief Remarks On Low Density Territories And Their Future. Finisterra 55, 163–168. <https://doi.org/10.18055/Finis20297>



of this, Alentejo has defined the local objective of being a lead market for sustainable energy, including renewable gases, as a prospective strategic idea for regional development and economic growth<sup>11</sup>. In a recent report by AFRY<sup>12</sup> hydrogen is projected to represent a relevant share of the energy supplied from the distribution grids in Alentejo, starting at today's 0 %, reaching 14 % and 57 % by 2040 and 2050, respectively.

Factsheet 1 focuses on the potentials of using biomass waste resources, located in the region Alentejo, Portugal, as a feedstock for hydrogen production by means of thermochemical methods such as gasification or pyrolysis.

## 1.2. Bio-based waste resources in Alentejo

### 1.2.1. Forest and agricultural waste resources

Alentejo is the region with the highest biomass waste production in Portugal, corresponding to 41.7 % and 31.3 % of the total agricultural and agro-industrial wastes, respectively. Table 1 summarizes estimated residual forestry and agricultural biomass available in Alentejo and Portugal, corresponding to potentially available biomass for use in biorefineries, even if some of these biomass wastes find other uses. Their low heating value (LHV) is high enough for thermochemical applications, other than incineration.

### 1.2.2. Municipal Solid Waste (MSW)

In 2019, the amount of produced was around 329 kt MSW in Alentejo. A significantly smaller amount compared to the total MSW produced in Portugal of 5.281 Mt the same year, reflecting its sparse population. On average, 69.4 % of MSW in Alentejo is landfilled, with a maximum landfilling value of 90 % for the waste management company Ambilital. The values indicate that MSW can be an interesting source for bioenergy applications, particularly for thermochemical conversion processes.

Table 1. Estimated amounts of biomass wastes available in Alentejo and Portugal <sup>13</sup>.

Biomass waste type	HHV (MJ/kg)	Alentejo (kt/year)	Portugal (kt/year)
<i>Agricultural wastes</i>			
Corn cob	17.6	768.8	1416.7
Rice straw	15.9 - 17.1	129.0	200.8
Vine pruning	17.8	296.1	974.7
Olive pruning	17.3	188.1	273.2
Fruit tree pruning	13.1 - 17.3	32.7	512.2

<sup>11</sup> CCDR Alentejo, 2021. Regional Innovation and Smart Specialisation Strategies - EREI 2030. Évora.

<sup>12</sup> AFRY Management Consulting, 2020. The role of Portuguese gas infrastructure in the decarbonisation process. [https://afry.com/sites/default/files/2020-03/the\\_role\\_of\\_portuguese\\_gas\\_infrastructure\\_in\\_the\\_decarbonisation\\_process.pdf](https://afry.com/sites/default/files/2020-03/the_role_of_portuguese_gas_infrastructure_in_the_decarbonisation_process.pdf)

<sup>13</sup> Charvet, F., Silva, F., Matos, A., Neves, D., 2021. Pyrolysis Characteristics of Undervalued Wood Varieties in the Portuguese Charcoal Sector 1–16. *Energies* 14(9), 2537; Enes, T., Aranha, J., Fonseca, T., Matos, C., Barros, A., Lousada, J., 2019. Residual agroforestry biomass-thermochemical properties. *Forests* 10, 1–21; García, R., Pizarro, C., Lavín, A.G., Bueno, J.L., 2012. Characterization of Spanish biomass wastes for energy use. *Bioresource technology* 103, 249–58; Gudka, B., Darvell, L.I., Jones, J.M., Williams, A., Kilgallon, P.J., Simms, N.J., Laryea-Goldsmith, R., 2012. Fuel characteristics of wheat-based Dried Distillers Grains and Solubles (DDGS) for thermal conversion in power plants. *Fuel Processing Technology* 94, 123–130; Missaoui, A., Bostyn, S., Belandria, V., Cagnon, B., Sarh, B., Gökalp, I., 2017. Hydrothermal carbonization of dried olive pomace: Energy potential and process performances. *Journal of Analytical and Applied Pyrolysis* 128, 281–290; Neiva, D.M., Araújo, S., Gominho, J., Carneiro, A. de C., Pereira, H., 2018. Potential of Eucalyptus globulus industrial bark as a biorefinery feedstock: Chemical and fuel characterization. *Industrial Crops and Products* 123, 262–270; Presidency of the Council of Ministers, 2017c. Council of Ministers Resolution no 163/2017 - National Plan for the Promotion of Biorefineries, *Diário da República*. Lisbon.

Nut tree pruning	17.4 - 17.8	1.6	18.8
<i>Agro-industrial wastes</i>			
Extracted olive pomace	22.5	75.0	88.4
Hard fruit shells	18.0 - 21.6	15.0	15.0
Brewery dreche	19.2	10.0	88.5
<i>Forestry waste</i>			
Maritime pine	20.6 - 21.6	31.1	543.9
Stone pine	18.9	53.4	76.7
Eucalyptus	15.2 – 19.3	124.4	447.9
Cork oak	18.2	115.1	130.4
Holm oak	17.1	78.3	87.4
Green herbaceous wastes	11.8 – 17.3	89.0	441.1
Shrubs	19.4 – 20.5	129.6	1025.4

### 1.3. Opportunities in Alentejo and Portalegre district

In the European Union (EU) the common opinion is that agricultural and agro-industrial biomass wastes should be used locally and on a small scale to avoid food versus fuel conflicts<sup>14</sup>. In view of the waste resources available, as specified in Table 1, this scenario clearly unfolds opportunities for the deployment of gasification-based processes in Alentejo. Decentralized small-scale gasification offers a production of different energy carriers, such as heat, power, energy gas, and potentially also hydrogen, without affecting local food security, providing an income for producers, and differentiated management options of bio-based agro-industrial wastes in rural areas. In case of hydrogen production, biomass gasification processes have a rather low technology readiness level (TRL) of 5, with reported difficulties processing heterogeneous wastes like RDF and MSW. However, a higher competitiveness with other grey solutions is expected with a higher technological maturity in waste-related issues and decreased in the coming<sup>15</sup>.

The potential for gasification-based products in Alentejo can be estimated via the practical availability of each biomass feedstock and the definition of the desirable end-use products and estimates for hydrogen is shown in Table 2. The potential is estimated without considering sustainability criteria and should be viewed as an approximation of the maximum theoretical potential in Alentejo, based on literature data validated in operational environments and process pathways with as high as possible TRL. Techno-economic uncertainty may therefore be significant for each feedstock.

Alentejo has in general the required market features in terms of actors, networks, and gas distributors, where conventional gas operators, dominating the current gas market segments (e.g., producers, distributors, and retail suppliers), are well-established in the region. They are likely to be the early movers for gasification technologies, but to further accelerate the market development specific conditions should be established for the, especially in terms of regulatory and technology advantages (financial incentives, government subsidies, and technology development in partnerships and joint ventures).

Table 2. Estimates of the potential of gasification-based hydrogen in Alentejo.

Feedstock category	Feedstock availability (kt/year)	Product potential (kt/year)

<sup>14</sup> Ferreira, S., Monteiro, E., Brito, P., Vilarinho, C., 2017b. Biomass resources in Portugal: Current status and prospects. *Renewable and Sustainable Energy Reviews* 78, 1221–1235. <https://doi.org/10.1016/j.rser.2017.03.140>

<sup>15</sup> Wakayama, T., Miyake, J., 2001. Hydrogen from biomass, in: Miyake, Jun, Matsunaga, T., Pietro, A.S. (Eds.), *Biohydrogen II*. Pergamon, Oxford, pp. 41–51. <https://doi.org/https://doi.org/10.1016/B978-008043947-1/50003-X>

Forestry biomass	653.3	71.9
Agricultural residues	1416.3	109.1
Agro-industrial biomass	100.0	5.8
MSW	329.3	65.7

## 1.4. Proposed actions to consider for IPP to enhance the waste to hydrogen development

Overall, the Alentejo region has the potential to be a regional lead market in Portugal for sustainable technologies such as gasification, taking advantage of local features to develop technology-related economic activities. This could be achieved by adopting a regional development strategy focused on gasification and other related technologies, future decarbonization targets established in national and European policies would be more easily fulfilled. Some proposed actions to consider realize this scenario is listed below:

- 1) Extending collaboration with industry, agricultural, communities, academy and R&D institutions: IPP is today collaborating with many stakeholders with an interest in renewable energy through EU projects, the BioBIP incubator, national projects, etc. To further strengthening the collaboration the formation of a more formal national networking platform could be advantageous. The network should not be connected to a specific project (even though support for initiating the platform could be in form of a project) and managed independently. The scope of the platform could be networking, R&D strategic planning for IPP, initiating projects, competence strategic planning connected to education, etc. Long-term, the platform could be supported by a yearly fee from the participants.
- 2) Build the capacities for R&D and demonstration of technology within the renewable energy sector: IPP has a good laboratory platform for developing bioenergy technologies with a number of lab-to-pilot scale equipment. The main part focus on the primary conversion of different feedstocks and there is a general lack of competence in processes for downstream processing to refine process streams from primary conversion to final products such as hydrogen. Facilities and competence in this area is of importance also for the education of engineers in the educational programmes and courses offered to the industry. One way to achieve this would be to tie external competencies from other universities or organization as guest researchers for supervising and teaching students and guiding in the build-up of infrastructure and competences.
- 3) Attracting and recruiting talented people: This point is related to point 2) above but aims at attracting and recruiting talented people including students (graduate and undergraduate) and researchers/teachers to IPP. Of importance is to create an arena, including IPP, communities and other external stakeholders in the Alentejo region, stimulating research, innovation, competence development, formation of start-ups, and industrial deployment of new technologies to attract people and to make them stay. This is a challenging task in view of IPP's location and the size of the city Portalegre.

## 2. Changes and opportunities in the landscape surrounding the IP system

This factsheet describes the present Innovation and IP system at IPP (Section 2.1) and changes and opportunities to improve the system to meet the demands of a system promoting innovation.

### 2.1. Present IPP Innovation and IP system

This section describes the present state of the innovation and IP system at IPP by summarizing accessible webpage information together with a roundtable at IPP discussion of the information followed by an analysis of the present state of the system.

#### 2.1.1. Summary of accessible information on the IPP webpage

The organisation units handling intellectual property rights and innovations is divided into two main bodies:

The Research and Innovation Office (GII): The mission of this body is the development of scientific research and innovation activities, the transfer of knowledge and technology, and the public dissemination of its results and, in cases where this is possible and desirable, its application.

In practice this is performed by coordinating and monitoring R&D activities in relation to the document "IPP Portalegre Research Policy - Programmatic Lines" (see Appendix 1, only in Portuguese online), translated to set of actions: i) Institutionalization and Management of Research & Development; ii) Valuing knowledge; iii) Research as a core process of the Integrated Management System of the Polytechnic of Portalegre; iv) Articulation between teaching and research. These actions are aligned with IPP's Quality Management System under the responsibility of a Continuous Improvement Group (GMC).

Information about the Research and Innovation Office is stated on the webpage: <https://www.ipportalegre.pt/pt/investigacao/investigacao-no-politecnico-de-portalegre/>

The Industrial Property Support Office: An interface between the academia (read IPP) and the as the industrial counterpart regarding IP and innovation systems. Its activity is directed by the "Intellectual Property Regulation" (see Appendix 1, only in Portuguese online, but a translated version available for the analysis) of IPP. Information about the Industrial Property Support Office: is stated on the webpage: <https://www.ipportalegre.pt/pt/investigacao/estruturas-de-apoio-investigacao/gapi/>

A third body is the Entrepreneurship and Employment Office (GEE) with the responsibility to develop and entrepreneurial culture facilitating the transformation of knowledge into business ideas, dissemination of innovative ideas and projects with the potential to create wealth and regional development. Another aim is to develop student's abilities in the search for new professional opportunities in the creation of one's own job in addition by helping in providing contacts, job/internship offers and support in applications. GEE is also responsible for collaborating with the activities of the Continuous Training Center (NFC), to promote courses and training actions that can enrich the knowledge acquired by students during the interaction with external professionals, to enhance their personal development and professional skills. The Entrepreneurship and Employment Office also oversees the direction of BioBIP – Bioenergy and Business Incubator of Portalegre, a structure dedicated to the incubation of companies, preferably technology-based, related to the training areas of IPP or to the use of regional resources.

Information about the Industrial Property Support Office: is stated on the webpage: <https://www.ipportalegre.pt/pt/empreendedorismo/gabinete-empreendedorismo-emprego/>

### 2.1.2. Summary of roundtable discussion at IPP and analysis of the present IPP Innovation and IP system

Roundtable discussions with different groups at IPP, students (MSc, PhD, including also postdocs), researchers/teachers and research managers as well as administrative personnel. The roundtable discussions aimed at identifying:

- Gaps in information and relevance
- How the webpage information is perceived by the different groups
- Interaction between the different bodies
- Weaknesses and strengths with the present structure
- Potential changes of the present structure to strengthen the IPP Innovation and IP system. Results related to changes are summarized in section 2.2 below.

The discussion transpired around the present webpage information and a tentative flowchart illustrating the present IPP Innovation and IP system as shown Figure 1.

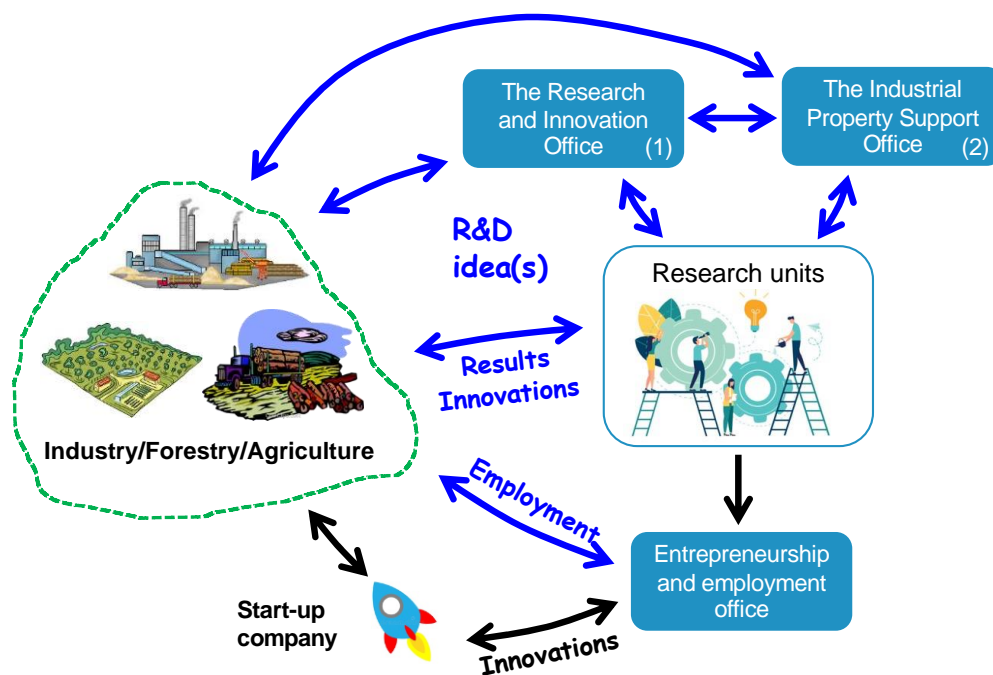


Figure 1. The actual outline of organizational entities and interactions between researcher/student with the IPP. (1) IPPortalegre Research Policy - Programmatic Lines and (2) Intellectual Property Regulation.

The figure describes the interaction between different entities where the Research units with researchers, students and research managers are of central importance, performing the actual research and training. The different bodies of the Innovation and IP system surrounds the Research units supporting the different aspects managing research and projects internally and in collaboration with external stakeholders, such as, project management, contractual matters, IPR, knowledge transfer, etc.

The findings from the analysis of the webpage, regulatory documents and the discussions in the different groups are summarized as follows:

- The platform, including organizational structures, personnel resources and regulatory/policy steering documents are in place at IPP, but is relatively new and still under development.
- The “Intellectual Property Regulation” document presents an attractive way to share intellectual property rights for an invention that are beneficial to both the inventor, which can be students, faculty members or employees at IPP, and IPP as an institution.
- The information in the “IPP Portalegre Research Policy - Programmatic Lines” document is outdated and in need of an update to better fit the present research activities and structures at IPP.
- The regulatory/policy documents are only available in Portuguese on the webpages.
- The information as presented on the webpages is rather vague and shallow providing with no overview or information on the interfaces between different entities in system. The reader is largely dependent on the regulatory documents found in a link in the webpage. The regulatory/policy information is only available in Portuguese. Information on support and whom to contact regarding: evaluation of innovative ideas, coaching/mentoring for developing ideas or establishing a start-up, seed funding opportunities for start-ups, how to handle intellectual property rights, etc.
- There is an obvious lack of coordination between the three entities in the innovation and IP system:
- Results or innovative ideas, produced in the Research units (Figure 1), are merely handed over directly to the industry or other stakeholders and rarely leading to any compensation (lump sum or compensation by licensing).
- There is no obvious process for developing start-ups as activities at the Entrepreneurship and Employment Office are mainly directed towards promoting employability of students. Therefore, establishment of start-ups driven by individuals from IPP is lacking.
- The incubator BioBIP - Bioenergy and Business Incubator of Portalegre and the location of Colab – Bioref at IPP campus are good platforms for stimulating formation of start-ups and contacts with industry
- From the discussion with group consisting of MSc and PhD students, and Postdocs, it is apparent that the group has no knowledge about the innovation and IP system at IPP.

## 2.2. Changes and opportunities developing the innovation and IP management system

To enable industrial and societal growth in Portalegre and its surrounding, it is important to establish an environment stimulating innovation, attracting talented people interested in developing new ideas from lab-to-innovation, progressing to start-ups. As identified in the analysis IPP has many of the pieces in the puzzle to become an institution promoting this scenario, creating an innovation hub in Portalegre. Figure 2 shows a prospective scenario of interactions between different entities and an aligned and reorganised IPP innovation and IP system. IPP Innovation and IP system is aligned where all organisational sections handling different aspects of research and innovation work together to support IPP research units, including individual researchers and students, managing legal issues, agreements, etc., with industry and other stakeholders. In case of establishing new start-ups, IPP Innovation and IP system supports the establishment of start-ups, based on innovations, on a shared basis between IPP and the inventor. The support provided is free and includes all parts of importance establishing start-ups, promoting industrial and societal growth.

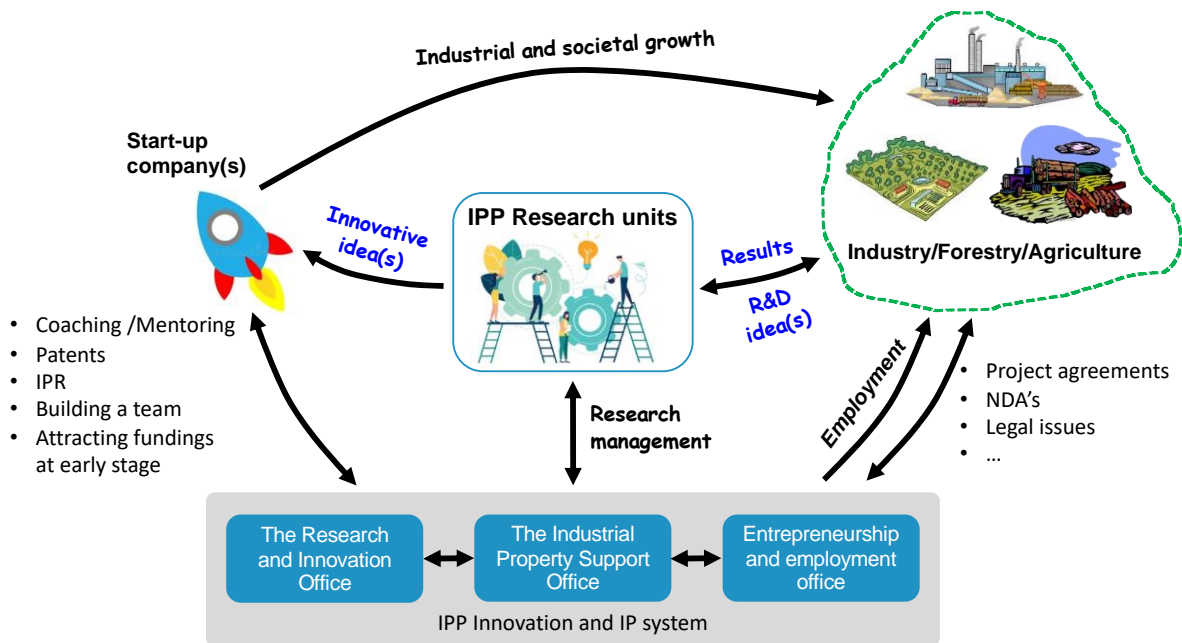


Figure 2. Flow chart of a potential innovation process including the IP system at IPP.

To realize the proposed scenario as depicted in Figure 2, some changes are desirable as briefly outlined below:

- Improvement of the collaboration between the three existing organisational sections framed as IPP Innovation and IP system including:
  - an organisation with staff dedicated towards innovation
  - a well-defined organisation with clear roles and interfaces between the sections and inside each section.
  - defined processes for administrating different tasks associated with industrial and stakeholder contacts, lab-to-innovation, supporting start-ups, intellectual property rights, research management, etc.
- Improvement of some part of the innovation support, especially focusing on:
  - attracting fundings at early stage
  - programmes for students/researcher/employers interested in lab-to-innovation and establishing start-ups
  - promoting contact with industry and investors interested in mentoring and participating in developing start-ups.
- Fostering an educational culture at IPP focusing on lab-to-innovation and support for establishing start-ups by enhancing the visibility of existing educational courses in entrepreneurship and employment, as well as developing programmes dedicated to innovation, such as an MBA, and perhaps also a BSc.
- Enhance the visibility of innovation support, mentoring and training by commencing an open and dedicated innovation webpage, i.e., a one-point access portal to innovation and IP system with clear straightforward information. The dedicated access point to innovation and IP may include information about and provide with access points towards:
  - Innovation's support
  - Coaching by expert(s) in innovation and start-ups
  - Attracting fundings at early stage

- Patents and immaterial rights
- Dedicated programmes for persons interested in innovation
- Support on how to build a team
- Mentoring by industrial



### 3. Specific actions to be taken to improve IP management

Specific actions to improve the IPP Innovation and IP system are detailed in Table 3.

Table 3. Proposed actions to improve IP management.

Improvement	Actions	Suggested time plan
Aligned and integrated organisational sections for innovation and IP management	1. Define the IPP Innovation and IP system organisation including the three existing sections	2 <sup>nd</sup> trimester of 2023
	2. Prepare processes for different support functions	2 <sup>nd</sup> trimester of 2023
	3. Define roles for staff	3 <sup>rd</sup> trimester of 2023
Strengthened and developed new support functions for the innovation and IP system	4. Expert position(s) in lab-to-innovation	3 <sup>rd</sup> trimester 2023
	5. Funding support for testing ideas and patenting	3 <sup>rd</sup> trimester 2023
	6. Seed funding opportunities for start-ups	4 <sup>th</sup> trimester 2023
	7. Improve and formulate a program for contacts with industry and investors for mentoring	4 <sup>th</sup> trimester 2023
	8. Develop an entrepreneurship program focus on innovation and start-ups	2024-2025
Educational culture promoting lab-to-innovation and start-ups	9. Enhanced visibility of existing courses	3 <sup>rd</sup> trimester 2023
	10. Stronger focus on innovation and entrepreneurship in existing courses	3 <sup>rd</sup> trimester 2023
	11. Develop an MBA in Innovation	2024-2025
Improved visibility of innovation strategies and support	12. Develop a single point access to innovation in form of a webpage	End of 2023

## 4. Appendix 1

### INSTITUTO POLITÉCNICO DE PORTALEGRE

#### Despacho n.º 8782/2018

Whereas:

1 - The Polytechnic Institute of Portalegre (hereinafter IPP) has as its mission, among others, the conduct of research and applied research, with a view to the transfer of knowledge, its valorization and sharing;

2 - IPP recognizes and consecrates technical and scientific research as fundamental pillars for the strengthening of its internal and external image, and for its affirmation as a key player in the socio-economic development of the region and the country.

3 - The protection and enhancement of intangible rights, the result of research and technological development, should be understood as an incentive to increase research and knowledge within IPP;

4 - The transfer, economic and social valorization of scientific and technological knowledge and the production and dissemination of the value of knowledge and culture are also attributions of IPP;

5 - IPP needs to regulate the intellectual property produced in the scope of its mission, attributions and competences, and should proceed to the definition and resolution of issues of ownership of rights arising from intellectual property, as well as the participation of creators or inventors in the processes of valuation and sharing of profits that may result from it;

6 - IPP intends to stimulate an innovative environment that allows the creation of technology-based companies from results arising from the Institute of the Institute;

7 - IPP intends to stimulate cooperation between all agents involved in the activity of creation, development or research, enabling an adequate management of innovation promoted by the institute;

8 - IPP intends to unconditionally safeguard the moral right of the inventor or creator, with the understanding that the personal dimension involved in creation, as a space of freedom, is inalienable, under any pretext;

9 - The role of the researcher and the units promoting research within the IPP, in the sense of recognition, should be privileged, when sharing profits, resulting from the valorization and exploitation of research results and the intellectual effort as an essential factor to the creative process;

10 - The Academic Council of IPP, which includes the governing bodies of the Organic Units of this Institute represented therein, issued a positive opinion, unanimously, in its Deliberation No. 10, of June 14, 2018;

11 - This regulation was the object of a public hearing and consultation under the terms of paragraph 3 of article 110 of the Legal Regime of Higher Education Institutions and articles 100 and 101 of the Code of Administrative Procedure, approved by Decree-Law no. 4/2015, of January 7. Under the terms of paragraph o), of no. 1, of article 92 of Law no. 62/2007, of September 10, which establishes the Legal Regime of Higher Education Institutions, and paragraph q), of no. 2, of article 29 of the Statutes IPP, approved by Normative Dispatch no. 39/2008, of July 30 of July 30, 2008, published in Diário da República No. 157, 2nd series, of August 14, 2008 August 2008, amended and republished by the Normative Dispatch no. 3/2016, of April 20, 2016, published in Diário da República No. 85, 2nd series, of May 3, 2016, I approve the Regulation IP of the Polytechnic Institute of Portalegre, annexed to the present order in this dispatch and which is an integral part thereof. It is published in the Diário da República, under the terms of article 139 of the Administrative Procedure Code. The present regulation enters into force on the day following its publication. August 28, 2018. - The President of IPP, Albano António de Sousa Varela e Silva.

## ANNEX

### Intellectual Property Regulation of the Polytechnic Institute of Portalegre

#### CHAPTER I

#### General Dispositions

##### Article 1 - Object and Scope

1 - The present regulation establishes the rules applicable to intellectual property rights and respective management resulting from any activity of creation, development or research carried out or pursued at the Polytechnic Institute of Portalegre, hereinafter referred to as IPP, in which its organic units, research units, functional units supporting academic activity, management activity and community services and any other units created for the pursuit of the Institute's objectives are included.

2 - The provisions of the present regulation apply to all IPP collaborators, namely faculty members, researchers, students, scientific research fellows and workers, regardless of the legal title of the employment relationship.

3 - The provisions of the present regulation also apply to third parties who are not IPP collaborators, but whose creation, development or research activities occur within the scope of or as a result of the exercise of functions or activities performed at the Institute - including students - or which imply the use of any significant IPP resources;

4 - The regulations apply to all partnerships and other initiatives, or projects carried out by IPP with third parties in the pursuit of its statutory objectives, regardless of their source of funding, as well as those projects or activities in which significant resources of the Institute are used, namely facilities or equipment.

5 - The provisions of the present regulation shall also be applicable, with the necessary adaptations, to services or entities created by IPP or which are under its tutelage and within the scope of activities developed by them and covered by the provisions of the previous paragraphs.

##### Article 2 – General principles

The general principles of the present regulation are the following:

a) IPP ownership of industrial property rights: Following the trends of most European and national higher education institutions, given the resources spent by the IPP;

b) Ownership of copyrights by the intellectual creator: In accordance with the nature and specificities of the regime provided in the copyright and related rights code and in the present Regulation.

c) Ownership of rights in computer programs and databases: Their growing strategic importance imposes a special provision within the scope of this Regulation.

d) Privilege of the inventor's moral right: The personal dimension involved in creation, as an area of freedom, is evidenced by the curricular added value achieved by the inventor.

e) Safeguarding of the role of the researcher: Privilege of the role of the researcher, understood in the sense of recognition, at the time of the sharing of the profits resulting from

the valorization and exploitation of the research results, of the intellectual effort as an essential factor in the to the creative process.

f) Cooperation: Cooperation among all agents involved in the activity of creation, development or research, enhancing an adequate management of innovation promoted by an adequate management of innovation promoted by the Institute.

g) Centralization of procedures: The natural complexity of the regulated matters requires, in the context of direct cooperation with inventors and creators, to the permanent, functional, and professional accompaniment of the of the process of protection of intellectual property rights.

h) Unity of decision: In the relationship of IPP with other entities, the negotiation of the exploitation and valorization of research results and other research results and other creations should be conducted in a centralized manner, by the former, in order to ensure maximum effectiveness and the success and transparency of the efforts made.

i) Transparency of decisions: All decisions taken in the field of the ownership and exploitation of research results must be necessarily justified and communicated to the researcher or creator in a timely manner.

j) Support for the creation of companies, namely technology-based companies and entrepreneurship: Given its strategic importance in the process of commercial exploitation of technologies.

### Article 3 – Concepts

It is understood that:

a) Intellectual property - rights for the protection of creations of knowledge or intellectual creations, namely, inventions in all fields of human activity, artistic literary and scientific works, distinctive signs, names and images used in commerce, divided into trade, divided into industrial property and copyright and related rights related rights.

b) Industrial property - rights of exclusive use, production and commercialization over the various technical processes of production and development of wealth, namely, patents, trademarks, industrial designs, designations industrial designs, designations of origin and geographical indications geographical indications.

c) Copyright and related rights - rights for the protection of intellectual creations in the literary, artistic, and scientific domains, comprising rights of a patrimonial nature and rights of a personal nature, known as moral rights. The related rights are intended to protect the performances of performers, phonogram and videogram producers and broadcasting organizations

d) Legal protection of computer programs - computer programs that have a creative nature are protected in a similar way to works of art. Analogous to that conferred on literary works, focusing on their expression in any form, and being equated to the computer program, for the purposes of protection, the preliminary design material of that program.

### Article 4 – Competences

1 - IPP defines the procedures it considers necessary for the implementation of the present regulation.

2 - IPP decides on the instruction of applications for registration of intellectual property rights or other alternative forms of valorization of the results of the results of creation, development,

or research activities, with the collaboration of the research activities, with the collaboration of the respective inventors or creators. To this end, they should be provided with all the necessary information, technical and other, final or interim.

3 - IPP manages the intellectual property rights it holds, determining the forms of valorization of the same, namely entering into licensing or exploitation contracts, with the collaboration of the respective inventors or creators, aiming at developing conditions for market agents to create economic value, maximizing the value of the value of the Institute's intellectual property.

4 - IPP defines the other norms of relationship with the external entrepreneurial and industrial environment, within the scope of research and development and technology transfer activities.

5 - IPP shares the exploitation results of its intellectual assets with its collaborators and non-collaborating third parties under the terms of the present regulation.

## **CHAPTER II**

### **Industrial Property Rights**

#### **Article 5 - Scope**

1 - The present regulation applies to all inventions and creations susceptible to protection by industrial property rights, such as invention patents, utility models, designs or models, plant variety rights or topographies of semiconductor modules, and its principles also apply.

2 - The regulation applies to computer programs with industrial applicability and capable of contributing to the resolution of technical problems.

3 - The regulation also applies to unpatented technical information and distinctive signs susceptible of registration, such as trademarks, logos, rewards, designations of origin or geographical indications.

4 - The regulation also applies to new objects of industrial property rights that may come to be legally protected.

#### **Article 6- Ownership of Rights**

1 - IPP consecrates, as a general principle, its right to ownership of industrial property rights generated within the scope of any activity of creation, development or research carried out or pursued in IPP, by any IPP collaborator, namely faculty members, researchers, students, scientific research fellows and employees, regardless of the legal title of their employment relationship.

2 - IPP also consecrates, as a general principle, in the situations foreseen in no. 3 of article 1 of these regulations, that, the realization of creation, development or research activities, susceptible of generating results subject to protection by means of industrial property rights, must be preceded by the signing of a document by the respective participants, which recognizes the attribution of ownership of such results and industrial property rights to IPP, or their transfer, in case they have been registered, as well as their subject to the rules set out in the present regulation.

3 - Concerning contracts or agreements entered between IPP and other entities, whose main or accessory object implies an activity of creation, development, or research, whatever its form or source of funding, such contracts or agreements must follow the regulations concerning the ownership of industrial property rights, as well as the exploitation of the results obtained.

## **Article 7 - Moral right of the inventor or creator**

The provisions of the previous article are without prejudice to the right of the inventor or creator to be mentioned as such in the application for protection of the invention or of the industrial creation and to claim its paternity and integrity.

## **Article 8 - Duty to inform**

1 - The inventor or creator should inform IPP of the realization of the invention or creation within a maximum period of three months from the date it is concluded.

2 - For the effects of the previous paragraph, the invention or industrial creation is concluded when it presents the characteristics that allow the instruction of the characteristics of the competent request for legal protection. protection.

3 - Without prejudice to the provisions of paragraphs 1 and 2 of this articles, in the course of the activity of creation, development, or investigation, the inventor or creator shall inform IPP of the potential research results susceptible to legal protection, in order to allow IPP to consider and have a timely analysis of the technical, economic, and legal implications of such results.

4 - The coordinator of creation, research or development activities, designated by IPP, in each project and whenever applicable, is also responsible for compliance with the provisions of paragraphs 1 and 3 of this article.

5 - The information shall be provided by the inventor or creator to IPP in writing, specifying the technical elements relative to the object and scope of the invention or creation, as well as all the information necessary for the respective processes of legal protection and economic exploitation.

6 - The inventor or creator should not prejudice any requests for legal protection or the analysis of the material and the elements whose respective protection may be requested by IPP.

7 - In case of non-fulfillment of the duty of information, IPP may prevent the access and use of its resources, without prejudice, to the maintenance of its right of decision as to the interest on the legal protection of the invention or creation and its right to be compensated.

## **Article 9 - Duty of confidentiality**

1 - The inventor or creator shall refrain from making any disclosures, publications' disclosure, publication of data, information, or any other form of knowledge or sharing of knowledge or sharing about the invention or creation without written authorization from IPP.

2 - Without prejudice to the provisions of the previous paragraph, the inventor or creator, whenever he needs to transmit information to third parties, should inform IPP of this situation and ensure that tIPP is aware of it, and ensure, beforehand, that the recipients of the information are bound by a confidentiality agreement, with a view to not prejudicing any legal protection.

3 - All those intervening in the information or data processing process are obliged to do so confidentially, so as not to prejudice the possibility of legal protection of the invention or creation, and the provisions of paragraph 1 of this article are applicable to them.

## **Article 10 - Duty to collaborate**

The inventor or creator shall collaborate with IPP to achieve the legal protection of the invention or creation and its economic exploitation, and whenever requested by the latter, namely by making all necessary information in a timely manner, assisting in the process of registration of rights and promoting the prospection of potential interested parties in the economic valorization of their inventions or creations.

### **Article 11- Decision process**

1 - Once the duty of information has been fulfilled by the inventor or creator, IPP should, within two months, issue a decision as to the interest in the inventor or creator to obtain the ownership of rights over the invention.

2 - The period foreseen in the previous number can be extended up to three months, if the special complexity of the research or the results of the investigation so require, namely when the collection of additional elements is indispensable. The extension shall be communicated to the inventor or creator, as well as its justification.

3 - The decision is the responsibility of IPP's President and shall consist of a report, which shall be communicated to the inventor or creator.

4 - The request for legal protection for the creation or invention by IPP, within the time limits established in paragraphs 1 and 2 of this article, constitutes an irrebuttable presumption of the manifestation of the creation or invention, of interest of the Institute in assuming title to the rights of the creation or invention, and the inventor or creator should be informed of the request for legal protection.

5 - Should IPP decide to provide the inventor or creator with the possibility of obtaining the title of rights over his invention or creation or does not manifest in a timely manner the intention to assume the ownership of those rights, according to the provisions of the previous numbers, the inventor or creator will acquire full ownership of these rights, including the exploitation rights, and may request on his behalf and at his expense the respective protection.

6 - In the case foreseen in the previous number, the inventor or creator gives IPP a non-exclusive, perpetual, non-transferable, and gratuitous license to use the invention or creation for scientific and academic purposes.

### **Article 12 - Legal Protection**

1 - IPP defines, in consultation with the inventor or creator, the scope of legal protection of inventions or creations whose property rights have not been disclosed to the public, as well as any question about the referred protection or rights, except in situations of co-ownership when this will be established by agreement or protocol between the parties.

2 - The inventor or creator may request IPP to revoke or alter its decisions foreseen in the previous paragraph and in article 11 of the regulations, based on maximization of economic value of the invention or creation, duly proven, the decision being the responsibility of IPP's President.

3 - The inventor or creator has the right to be informed of the steps concerning the status of the legal protection process.

4 - IPP assures the execution of registration procedures, maintenance, defense, and surveillance of national applications for legal protection, being that in situations of joint ownership the division of responsibilities will be established by agreement or protocol between the parties.

### **Article 13 – Expenses**

1 - IPP will bear all charges inherent to the processes of registration, maintenance, defense and surveillance of national requests for legal protection that it requests and of which it is the sole holder, and in situations of joint ownership, the distribution of costs will be established through an agreement or protocol between the parties.

2 - In the case of community and international requests and registrations applications and registrations, unless the IPP decides otherwise, the inventor or creator must have the source of financing for its registration, maintenance, defense, and surveillance through external sources such as projects, subsidies, industrial support or others.

### **Article 14 - Exploitation method**

1 - IPP defines, in consultation with the inventor or creator, the most appropriate form of exploitation of inventions or creations whose industrial property rights, as well as any questions concerning the said exploitation, except in the situations of co-ownership, in which this will be established by agreement or protocol between the parties.

2 - The inventor or creator may apply to IPP for revocation or alteration of its decisions foreseen in the previous number, based on maximization of economic value of the invention or creation, duly proven, being the decision the responsibility of IPP's President.

3 - The inventor or creator has the right to be informed by the Institute of all the steps concerning the exploitation process, namely the terms of the contractual proposals.

### **Article 15 - Net Income**

The revenues to be shared refer to the amounts obtained in the process of valorization of industrial property rights, in any form deduced from the fees or taxes due, formalities of the application registration, maintenance, defense, surveillance of industrial property rights and other and other consultancy, the fees of professionals involved in the protection and tutelage phase as well as those incurred in the commercialization and exploitation phase of the same rights.

### **Article 16 - Income Sharing**

1 - Without prejudice to any provisions established through agreement or protocol that stipulate differently, the net revenues calculated under the terms of the previous article, will be distributed as follows:

- a) 55 % to the inventor or creator or research team;
- b) 45 % to IPP.

2 - Of the percentage that belongs to IPP, under the terms of the division established in the previous number, 30 % shall be allocated to the respective organic and/or research unit or others in which the inventions or creations were developed for which the Institute holds industrial property rights.

3 - Whenever there are several inventors and/or units, the benefits accruing to them according to the formula used in the previous paragraphs shall be be equally distributed, unless there is



an agreement between them that stipulates differently and provided that the inventors themselves bring this agreement to the attention of the Institute.

### **Article 17 - Transfer of ownership of the right**

1 - If IPP, in the use of the powers of administration of its industrial property rights, decides to give up the maintenance of the required legal protection, it should give prior notice to the inventor or creator, offering him the opportunity to transfer the ownership of the right in question.

2 - The communication referred to in the previous number must be made at least 90 days prior to the deadline for conservation of the rights in force.

3 - If the inventor or creator manifests the intention to assume the title of the right, ownership of the right, a contract must be entered into for the transfer of that right, whereby the inventor or creator becomes responsible for all the charges relating to ownership of the right, namely protection, maintenance and exploitation of the same.

## **CHAPTER III Copyright and Related Rights**

### **Article 18 – Scope**

1 - This regulation applies to all creations susceptible of protection by copyright and related rights, such as all intellectual creations in the literary, scientific, and artistic domain, whatever the genre or form of expression, namely literary works, works of art, audiovisual works, multimedia works or any other creation that may be considered a work under the terms of the legislation in force, including computer programs and databases.

2 - Successive editions of works, even if corrected, augmented, recast or with a change of title or format, are not works distinct from the original work, nor are reproductions of works of art, albeit of various dimensions.

3 - The provisions of this regulation will also apply to new objects of copyright or related rights that may eventually be legally protected.

### **Article 19 - Ownership of Rights**

1 - IPP recognizes, as a general principle, that copyright ownership concerning works conceived or realized by its faculty members, researchers, other employees, independently of the legal employment relationship, or contracted staff, in the exercise of their functions, belongs to the respective intellectual creator or author.

2 - Without prejudice to any legal provisions that stipulate or may stipulate differently, intellectual creators or authors foreseen in paragraph 3 of article 1 of these regulations also own the copyright to works conceived or realized within the scope of any research or teaching activity at IPP.

### **Article 20 - Special cases**

1 - IPP may assume ownership of copyrights and related rights, being IPP's president the responsible for the respective decision, namely, in the following situations: a) The work is the result of execution of a contract entered into with the Institute, in which the ownership of copyrights belongs to IPP; b) Execution or conclusion of the work implies significant use of means or resources of the Institute.

2 - The design and development of computer programs and databases, not covered by the preceding chapter, are presumed to imply significant use of IPP means or resources.

3 - Without prejudice to the provisions of paragraph 1, the intellectual creator or author of the work shall maintain moral rights, being always designated as such.

4 - IPP manages copyrights of which he/she is holder or co-holder.

5 - To the production of pedagogic material the provisions of Article 33-A of the Statute of the Career of Teaching Staff of the Polytechnic Higher Education apply.

### **Article 21 - Significant use of IPP resources**

1 - Execution of any work that implies the use or availability of IPP's means and requires the prior authorization from IPP, to be granted by its president upon mandatory request by the intellectual creator or author.

2 - The referred authorization shall contemplate regulation of ownership and exploitation of the respective copyrights, under the terms of this regulation.

3 - In case of non-compliance with the provisions of paragraph 1 of this article, IPP may prevent the access and use of its resources, without prejudice of maintaining its right of decision as to the interest on the legal protection of the creation and its right to be compensated.

### **Article 22 - Mention of the Institute**

Where the realization or completion of the work involves the employment of means or endowments of the Office, the Office must be named in the work.

### **Article 23 – Contracts**

Contracts entered between IPP and any other entities regardless of their nature, whose main or accessory object involves the creation of works, must always foresee the regulation of ownership and exploitation of the respective patrimonial rights.

### **Article 24 – Income**

Net income, resulting from works in IPP, are defined in terms of article 15 and will be distributed in terms of article 16, or both of these regulations, with the necessary adaptations.

## **CHAPTER IV R&D Contracts and Spin-Offs**

### **Article 25 - R&D Contracts**

1 - All contracts or agreements, entered between IPP and other entities, of any nature, whose main or accessory object involves the activity of creation, development, or research, regardless of how they are financed, must compulsorily provide for the regulation of the ownership of intellectual property rights and exploitation of the results obtained.

2 - The mandatory provision regarding the ownership of intellectual property rights established in the previous number may determine that IPP is not the owner of the rights inherent to the results obtained. It is up to IPP to decide, in compliance with the Institute's statutes.

### **Article 26 - Creation of spin-offs**

In cases where IPP, jointly with the inventors or creators or third parties involved in creation, development, or research activities, conclude that commercial exploitation of the emerging results, namely by the incorporation of a commercial, is an outcome, like the establishment of a commercial company with the purpose of exploiting such results, it is mandatory to have a written agreement between the intervenient parties, in compliance with the Institute's by-laws.

## **CHAPTER V Final and Transitory Provisions**

### **Article 27 – Legislation**

Intellectual property issues within the scope of IPP are regulated by these regulations, by the Industrial Property Code, the Copyright and Related Rights Code, by the legislation applicable to the legal protection of computer programs, databases and the legal protection of plant varieties, and other applicable legislation in force.

### **Article 28 - Interpretation and integration of gaps**

The interpretation and integration of gaps in the present Regulation the cases omitted herein, shall be done in compliance with the applicable legislation and in light of the general principles of Law, under the terms provided for in the Institute's Statutes.

### **Article 29 - Alternative Dispute Resolution**

Alternative dispute resolution under the terms of the applicable legal norms, the Institute admits the recourse out-of-court dispute resolution mechanisms for disputes arising out of the relationships regulated by the present regulation