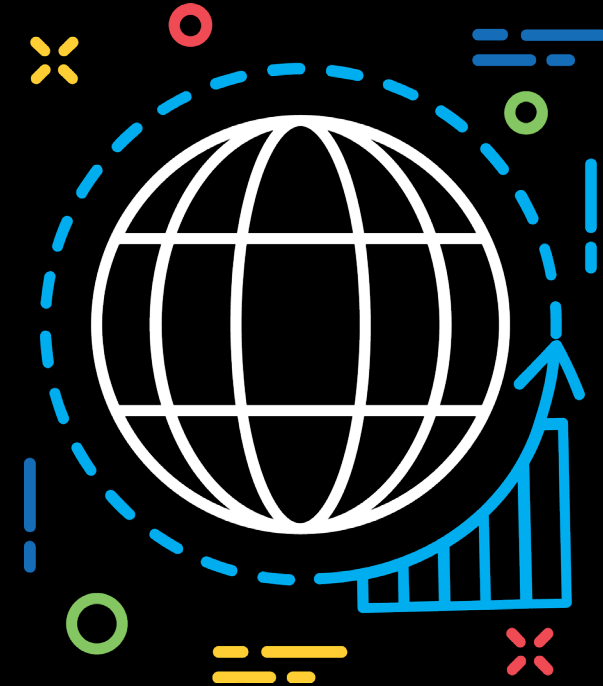


ACTIVITY AND RESULTS IN 2020

2021/05/21 - 10H00

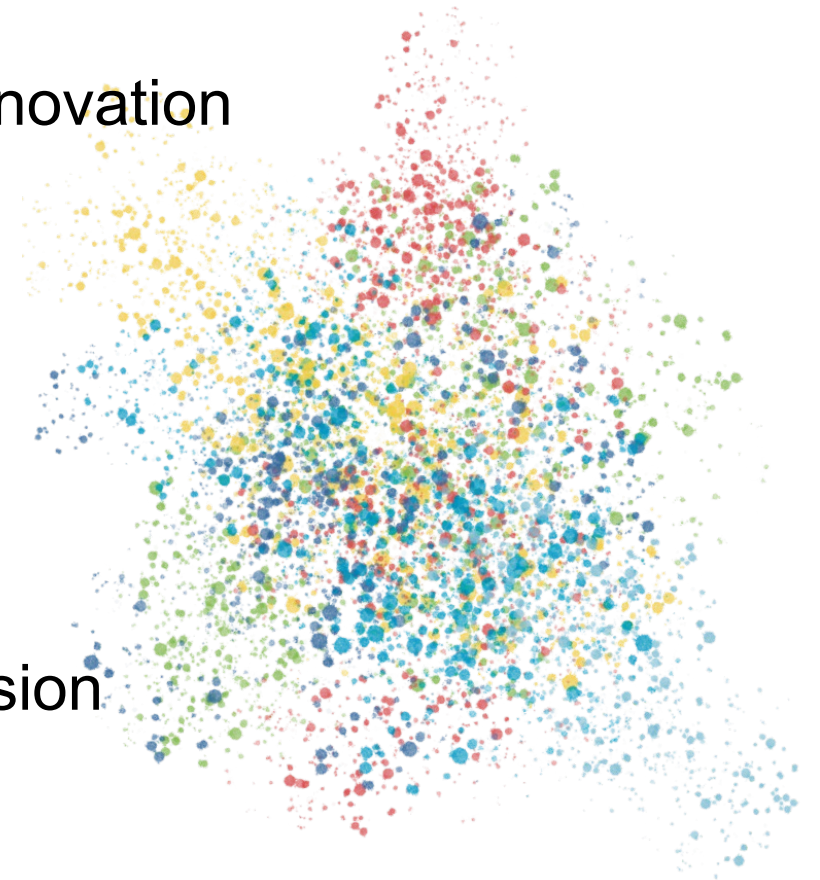
from knowledge
generation to
science-based
innovation

ACTIVITY REPORT 2020



POLICY PRIORITIES IN 2020

- Full coverage of the knowledge value chain
- Excellence in research, talent development, and innovation
- Integration and multi-disciplinarity
- Scale, density, and critical mass
- International visibility and presence
- Ethics, social responsibility, and diversity and inclusion

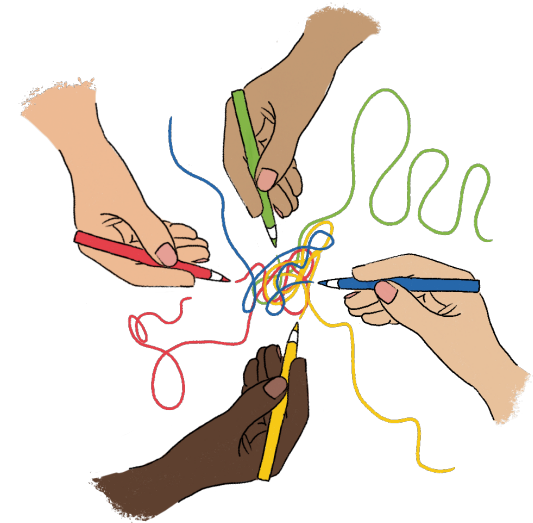


HIGHLIGHTS IN 2020

FACING THE PANDEMIC

• PROTECT

- Protection and support for INESC TEC Community Members
 - Adoption of telework – with exception of essential services, on a rotating basis
 - Dissemination of guidelines and support tools; reinforcement of the central support infrastructures
 - Regular communication; training; support lines
- Activity maintenance
 - Strengthened communication with partners
 - Activity monitoring and rescheduling

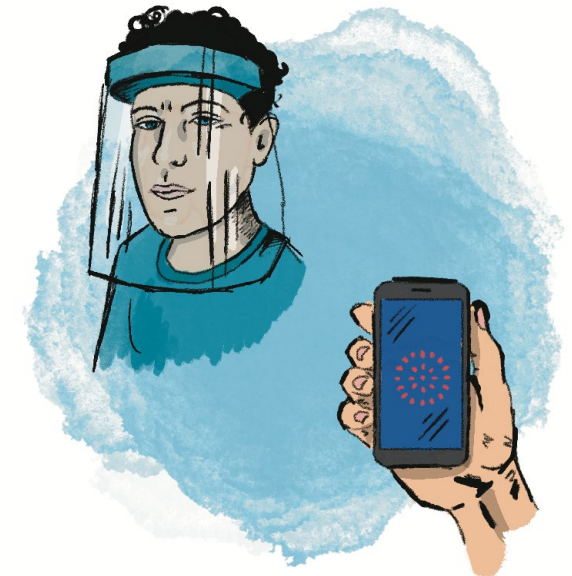


HIGHLIGHTS IN 2020

FACING THE PANDEMIC

- **REACT AND IMPACT**

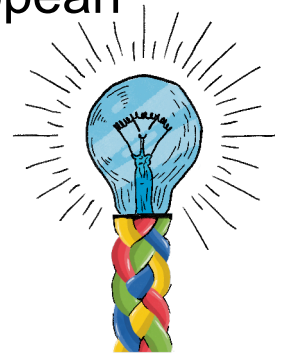
- Immediate mobilisation and participation in multiple initiatives with national and international partners
 - Production of protective visors (UPorto)
 - Field ventilator PNEUMA (ARS-Norte)
 - Study “Diaries of a Pandemic”, CoronaSurveys
 - RADAR Robot, CXR_AI4COVID-19, COVID_3PRINT Initiative
 - LIG@R, CAIRUS, THOR, VITALPROVID
 - Psicovida Application
 - STAYAWAY COVID Application (Ministry of Health)



HIGHLIGHTS IN 2020

• SCIENCE WITH IMPACT

- One of the **Top 5** Portuguese organisations in net contribution and participation in H2020 competitive research funding (36% funding → European)
- One of the **Top 5** national entities in patent applications submitted to the European Patent Office (EPO) (fourth consecutive year)
- Continued investment in laboratory infrastructures
 - Improvements in the Energy and Sea laboratories
 - Launch of the iiLab (Industry and Innovation Lab) extension project in P.Porto's PORTIC premises (3.3 M€)



HIGHLIGHTS IN 2020

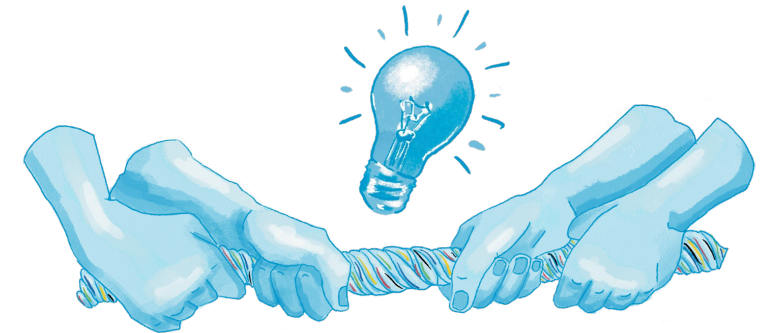
MAIN INITIATIVES

- **Managed science model**

- TEC4Clusters workshop; progressive redefinition of the concept of Cluster
- Recruitment of researchers for key strategic areas (31)

- **Internal initiatives**

- 2nd edition of the Internal Seed Projects → 5 new R&D exploratory projects
- Virtual meeting with the new Scientific Advisory Board



HIGHLIGHTS IN 2020

MAIN INITIATIVES

- **Internationalisation**

- Creation of the International Relations Service
- Full operation of INESC Brussels Hub
- Consolidation of INESC P&D Brasil with new Associates
- Coordination of the UT Austin Portugal Program
- Intensified participation in 3 KIC (EIT Manufacturing, EIT Raw Materials and EIT Digital)
- Active participation in 15+ International Associations



HIGHLIGHTS IN 2020

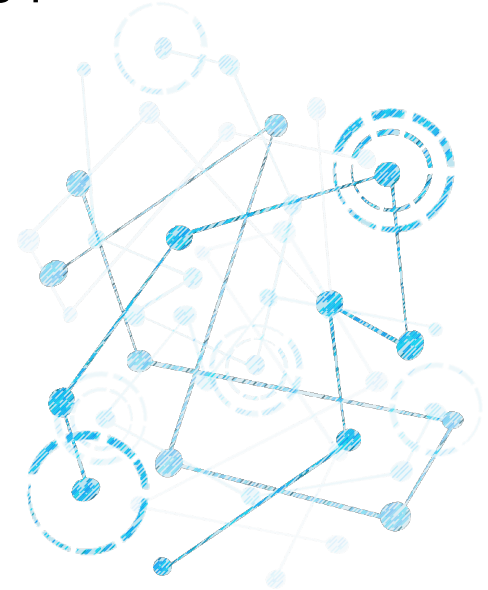
MAIN INITIATIVES

- **Calls of strategic importance**

- Application to the renewal of the Associate Laboratory title
 - Classification of Excellent and title renewed for 10 years (*results disclosed in 2021*)
- Strong participation in FCT, ANI and H2020 calls – anticipating bridging period between funding programmes
- FAI/FEE Call – Deucalion Green Supercomputer

- **Contributions for public policy**

- Part of the Working Group to simplify R&D Projects
- Active involvement in 9 CoLABs



HIGHLIGHTS IN 2020

MAIN INITIATIVES

- **Openness to society**

- New magazine “INESC TEC Science & Society”
- Adoption of hybrid format or rescheduling of events - 35th Anniversary and Autumn Forum
- Highest media presence in the last 20 years

- **Structural initiatives**

- Proposal of a Code of Ethics
- Matured work in conflict of interest management, diversity and inclusion, social responsibility and data protection



HIGHLIGHTS IN 2020

MAIN INITIATIVES

- **Support structure**

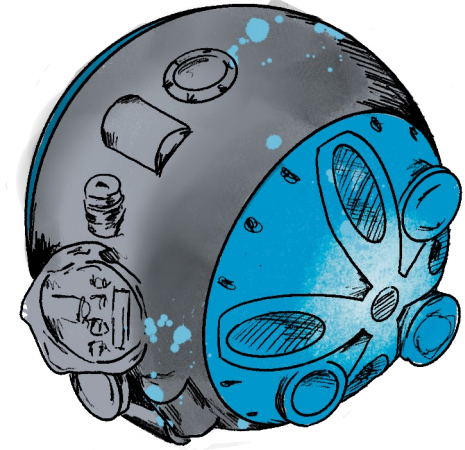
- Development of a new model for Human Resources management
- New INESC TEC Grants Regulation
- Reinforcement of the Funding Opportunities Office and of the institution's information systems

- **Infrastructures**

- Construction of the TEC4Sea research vessel
- Launch of adaptation works in PORTIC for the iiLab's expansion

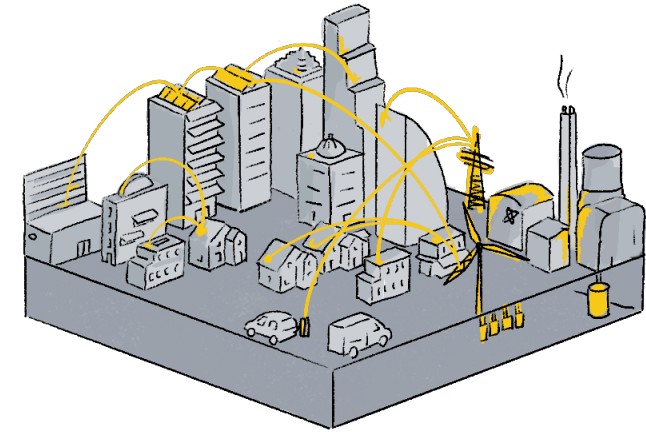


MAIN S&T ACHIEVEMENTS IN 2020 (NIS)



- **Optical graphene microphone**, membranes in optical fibres for acoustic or pressure sensing
- **Parallel Implementation of K-Means Algorithm on FPGA** to optimise the system's processing time, enabling the edge intelligence concept
- **Uncertainty-aware deep learning-based approach for computer-aided diagnosis and grading**
- **Multi-sensor system for underwater docking operations** that combines short-range acoustic positioning with visual perception

MAIN S&T ACHIEVEMENTS IN 2020 (PE)



- Design and implementation of the second generation of a **home energy management system (HEMS)**, capable of determining the flexibility within a household
- **First prototype (P2PChain) of a local market platform for energy trading** based on Ethereum blockchain technology with an innovative post-delivery local energy market design
- **Data-driven methodology to predict distribution lines (overhead and subterranean) failure location** in HV and MV networks operated by E-REDES
- Development of a **methodology to monetise the benefits of the investments in the distribution system** concerning the security of supply, the quality of service, the distribution losses and operational efficiency



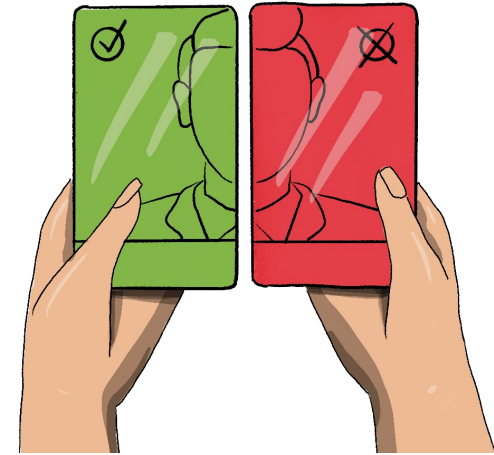
MAIN S&T ACHIEVEMENTS IN 2020 (ISE)



- **Production Planning and Scheduling.** A real time scheduling engine integrated with an IIoT platform to monitor, detect and evaluate disturbances on plan execution, and suggest corrective measures
- **Mathematical Programming-based heuristics.** Approaches applied on emerging topics related to **urban logistics** (in particular “**last mile**”)
- **Navigation, Localisation and Coordination of Mobile Robots.** A novel open-source Path Planning solution Aware of Robot's Centre of Mass for **Steep Slope Vineyards**
- **Service Design.** Co-creation and launch of the ServCollab, a global initiative of service researchers to improve **well-being**

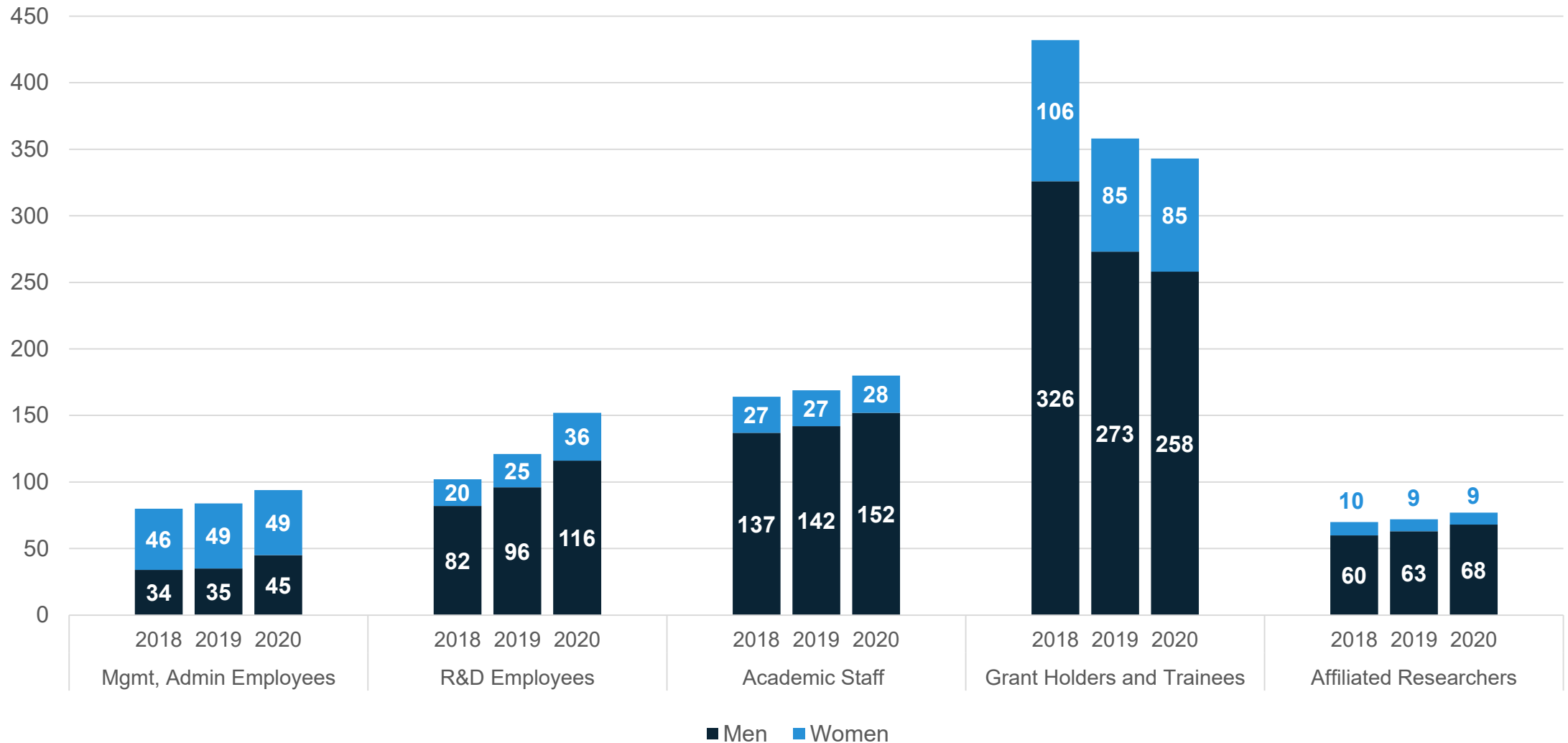


MAIN S&T ACHIEVEMENTS IN 2020 (CS)



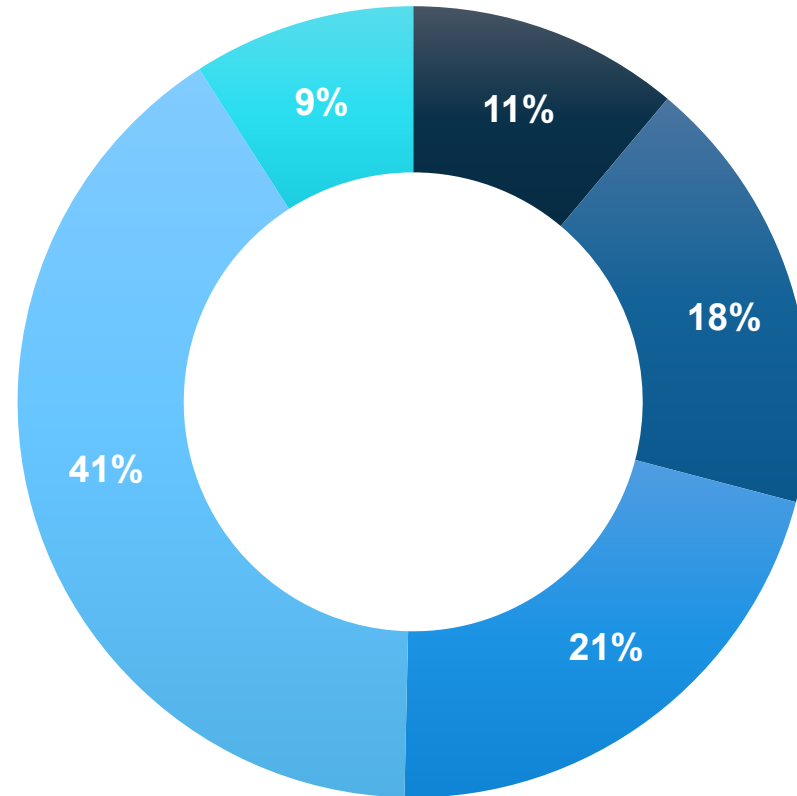
- Design and development of **STAYAWAY COVID**, contribution to the protocol underlying the Apple/Google Exposure Notification service and Huawei's Contact Shield
- Co-chairing of the **Portuguese node of the Research Data Alliance (RDA)** and involvement in the **European Network of Excellence on Artificial Intelligence**
- Theoretical groundwork deemed referential to the **Immersive Learning Research Network (ILRN)** and multiple contributions on the impact of multisensory stimuli in virtual environments
- **Summer School on Machine Learning and Big Data with Quantum Computing** that brought together about 2 000 participants (in collaboration with UPorto, P.Porto e INESC TEC)

ALIGNMENT WITH PUBLIC POLICIES ON HUMAN RESOURCES IN SCIENCE AND TECHNOLOGY



STRENGTHENING CAREERS IN R&D

- MGMT, ADMIN EMPLOYEES
- R&D EMPLOYEES
- ACADEMIC STAFF
- GRANT HOLDERS AND TRAINEES
- AFFILIATED RESEARCHERS

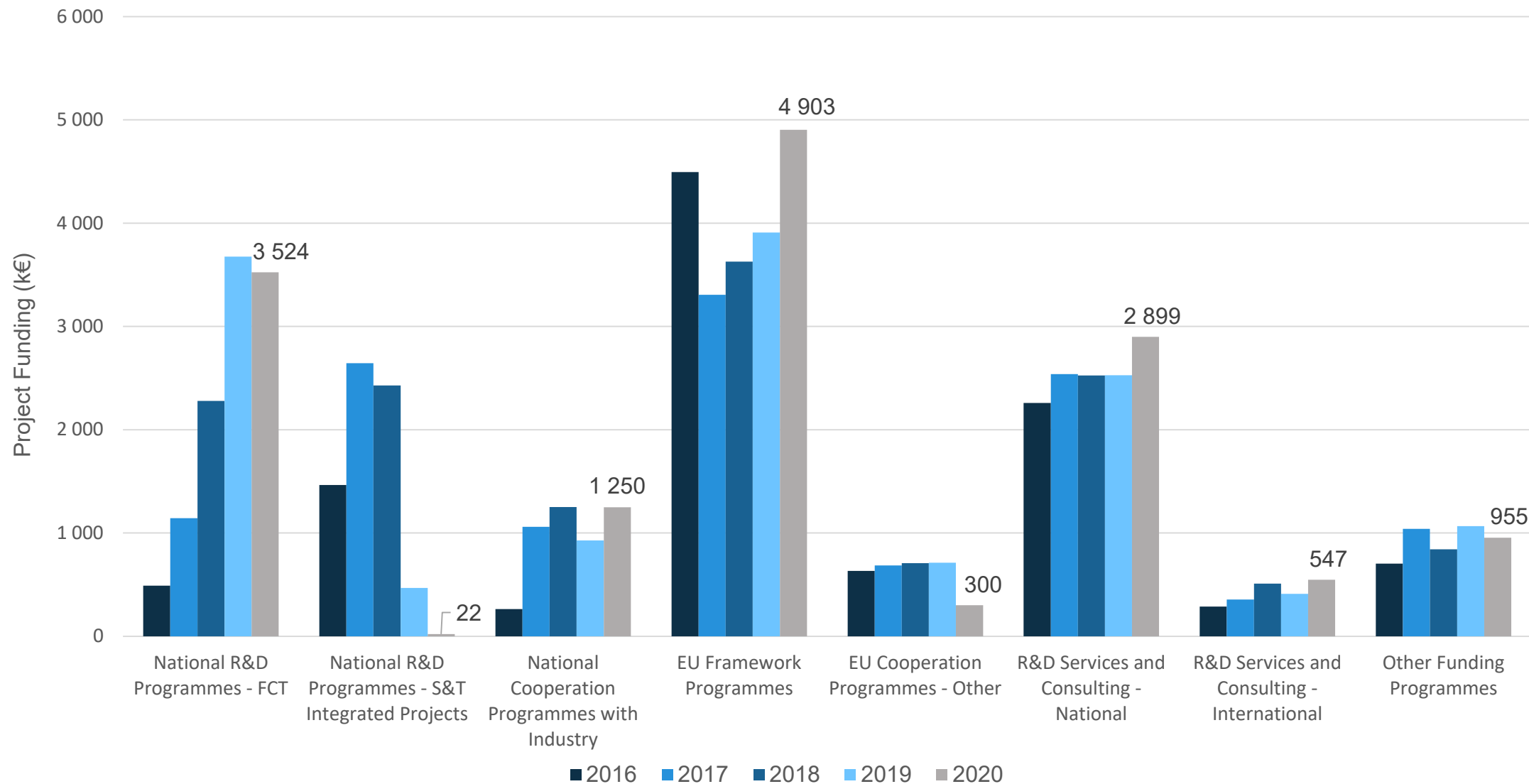


Increase of 26% in
R&D Employees



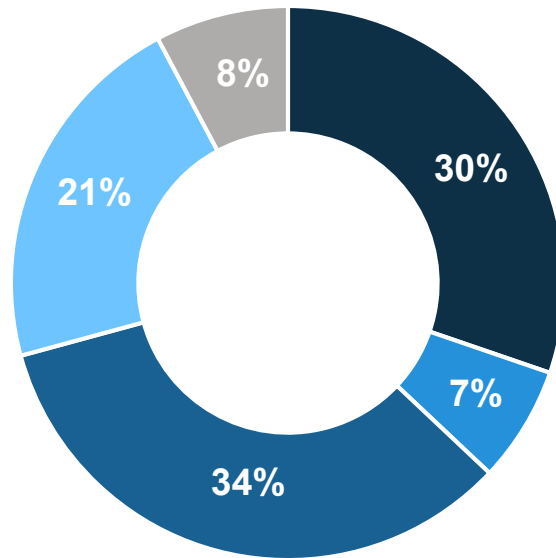
Integrated HR
24% Women
> 25 Nationalities
> 70 Foreign Researchers

GROWTH AND FLEXIBILITY FACING FUNDING CYCLES

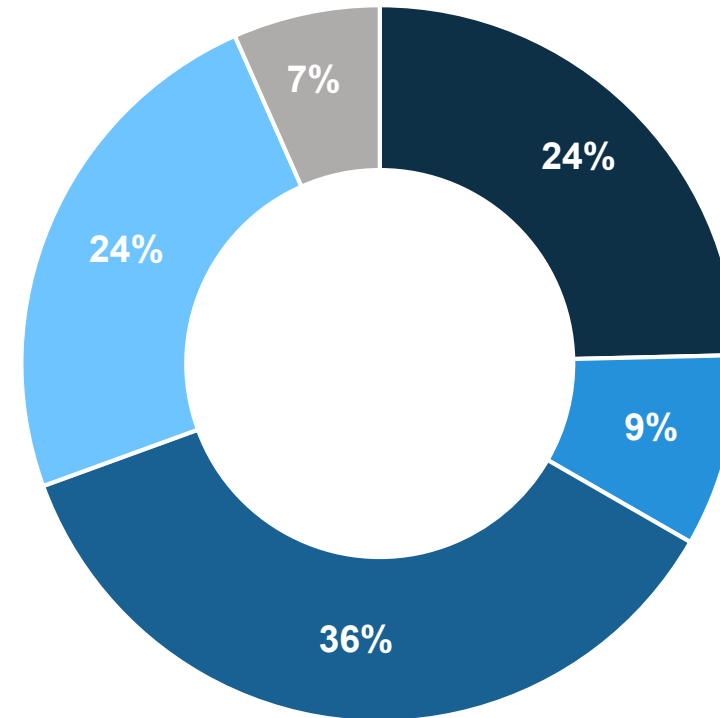


DIVERSIFICATION AND SUSTAINABILITY

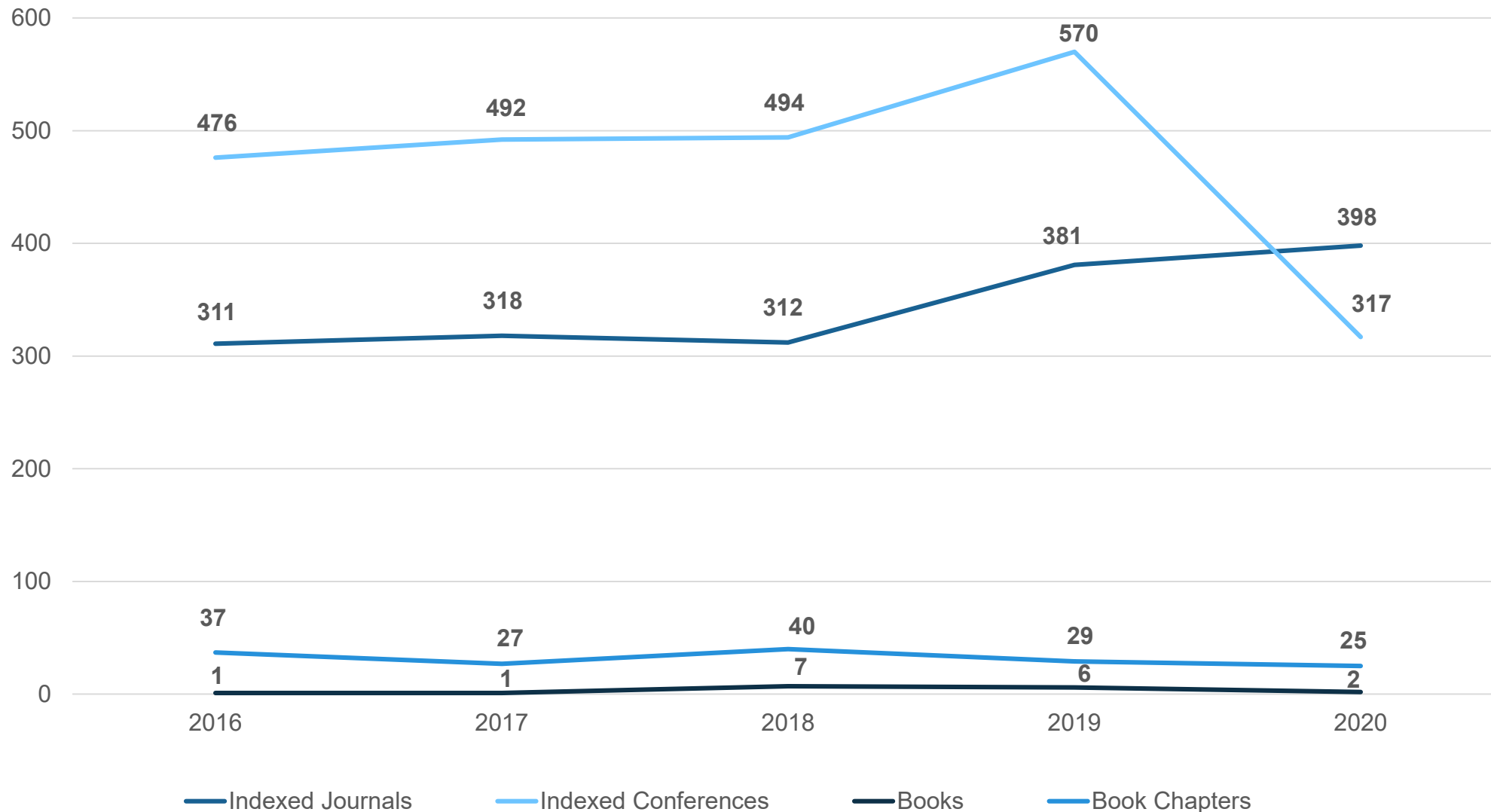
2019



2020



STRATEGIC FOCUS ON JOURNALS AND THE PANDEMIC EFFECT ON CONFERENCES



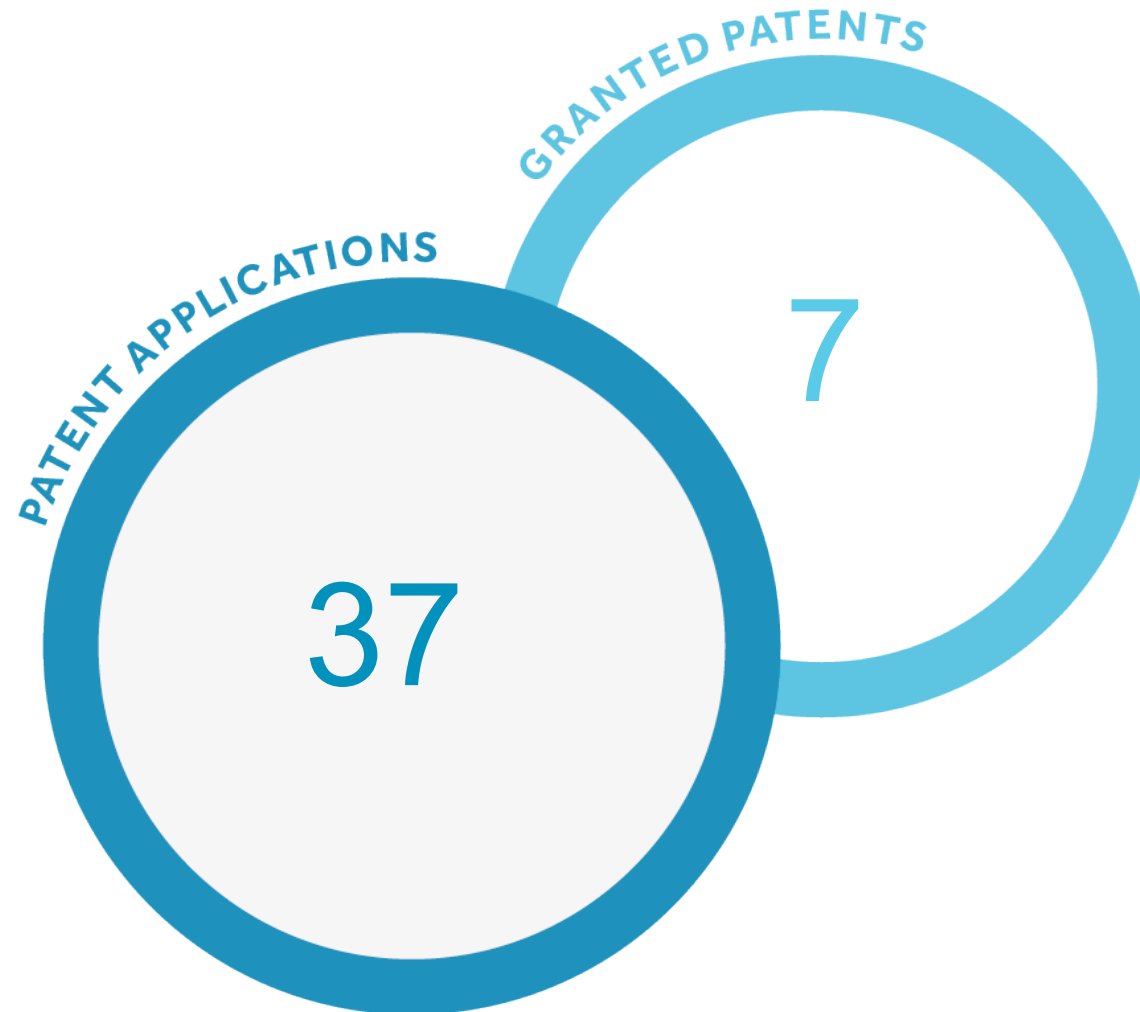
Increase in journal publications per Core PhD

245 articles in the 1st Quartile

SCIENTIFIC PRODUCTION AND ECONOMIC SUSTAINABILITY

Indicators		CTM	CAP	CRAS	CBER	CPES	CESE	CRIIS	CEGI	CITE	CSIG	LIAAD	CRACS	HASLAB
Publications	Indexed Articles in Journals / FTE	1.0	1.0	0.4	1.8	2.8	0.8	1.4	0.9	1.8	1.0	0.9	0.7	0.4
	Indexed Publications / FTE	1.9	1.1	0.7	3.0	4.0	1.7	2.8	1.4	2.7	2.0	1.6	2.1	1.4
Activity in Projects	Total Funding (k€) / FTE	45.4	32.1	56.8	19.7	67.9	48.7	37.9	27.0	37.3	29.9	18.9	12.4	36.9
	Total Margin (k€) / FTE	3.3	0.1	0.6	-5.5	7.1	0.1	1.5	0.1	5.3	-1.8	2.7	3.7	3.7

MATURITY IN THE PROTECTION OF KNOWLEDGE



7 first priority filings (new inventions)
30 applications (internationalisation)

Head of SAL appointed new
ambassador of the European IP
Helpdesk in Portugal

COOPERATION WITH THE ASSOCIATES

Area	Discrimination	UP-FEUP	UP-FCUP	UP-FEP	P.PORTO-ISEP	UM	UTAD
Involvement of Academic Staff	Core researcher	77	29	10	15	16	19
	Affiliated researcher	24	2	2	6	7	11
Scientific Publications	Articles in indexed journals	209	46	19	8	9	37
	Articles in indexed conferences	123	44	7	12	22	39
Activity in Projects	National programmes	47	11	3	7	5	5
	EU programmes	38	16	6	20	2	7
	R&D services	63	13	6	10	10	4
	Others	10	1	3	2	3	3
Postgraduate Qualification	Postdoc grant holders	15	7	2	1	4	2
	PhD grant holders	50	22	5	2	6	8
	Research grant holders	80	25	5	16	7	5
Theses and dissertations supervised (submitted in HEI)	Completed master's dissertations	334	48	85	43	28	
	Ongoing PhD theses	141	76	14		4	28

ECONOMIC & FINANCIAL INDICATORS 2020



2019 VS 2020 RESULTS

EXPENSES (€)	2019	2020	Variation	Δ %
External supplies and services	5 214 403	4 642 909	-571 494	-11.0%
Personnel costs	11 137 442	12 196 967	1 059 524	9.5%
Other expenses and losses	591 794	418 392	-173 403	-29.3%
Provisions, depreciation and impairment losses	952 941	927 214	-25 727	-2.7%
	17 896 581	18 185 482	288 901	1.6%
Financial expenses and losses	41 906	42 965	1 059	2.5%
	17 938 487	18 228 447	289 960	1.6%

INCOME (€)	2019	2020	Variation	Δ %
Sales and services rendered	3 300 301	3 644 369	344 068	10.4%
European programmes	4 742 651	5 302 765	560 114	11.8%
National programmes	9 436 861	9 101 051	-335 810	-3.6%
Other income and gains	483 191	199 543	-283 648	-58.7%
	17 963 004	18 247 728	284 724	1.6%
Financial income	3 490	7 091	3 601	103.2%
	17 966 494	18 254 819	288 325	1.6%
Operating results	66 423	62 247	-4 176	-6.3%
Net financial results	-38 416	-35 874	2 542	6.6%
Net income	28 007	26 373	-1 634	-5.8%

