

INNO PROVEMENT

Translating Industry 4.0 to improved SME policy instruments targeting

Regional Action Plan

COMPETE 2020 - Operational Programme for Competitiveness and Internationalisation

Project Partner 6



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Lisbon, November 2021



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Executive summary

This action plan is a group of small pieces, in all aspects like LEGO Pieces. Although there is no Danish participation on the INNPROVEMENT project, the LEGO analogy of building blocks is important. Today, those LEGO building blocks have various shapes and sizes. New types of pieces, some of them very complex in how they were designed. That complexity, new shapes or new uses do not preclude those pieces of fitting perfectly to those produced 50 years ago. The LEGO principle demands it. All pieces from the first produced to those leaving the factory today, must fit. And all of them must respond to a simple need: be part of a whole.

LEGO has evolved from being only a game for kids, to, Collector's items for AFOL (Adults Fans of LEGO), to devise a robotic system (Mindstorms) And all of this starts with the humble building block.

How does this relate to this Project and to Industry 4.0? If we focus in the building block alone, it does not. But if we focus on the point that a building block must connect to all other building blocks without fail, that those building blocks should control, register, and enable us to improve, then the analogy grows. LEGO enabled kids to create everything being limited only by their imagination.

And Industry 4.0 is doing the same. The set of blocks is smaller. But those blocks need to fit together.

These new building blocks are information. The information built and collected from every system, designed from the ground up as Industry 4.0, or as legacy systems that were adapted to these concepts. They are the concepts of I 4.0, where their true potential is shown when new arrangements are created, or as it is happening, when the building blocks create new and different building blocks.

In December of 2019, with final version of the Regional Partner Assessment, in the first pages of that document we stated:

In broad strokes, the Regional (Portuguese) context shows the need of improved I4.0 public policy initiatives, demonstrates that SMEs need to evolve and embrace The Digital Economy, but also all that the possibilities provided by Industry 4.0 concepts, are not yet broadly known. But mostly, within the Innprovement project, we must find tools that enable the SMEs to integrate



the I4.0 concepts in a strategic evolution and redefinition of their own nature as enterprises.

And then, the COVID 19 pandemic hit.

Since then, some industries adapted. Invested where they could and kept working. At least most of them. But many stopped. According to the Economic Bulletin from Banco de Portugal (Portuguese Central Bank) of December 2020¹, In the first semester of 2020 the economic activity fell 17,3% when comparing with the same period of 2019, while there was a recovery of 13,3% in the third quarter, when compared to the prior quarter. Also, exports decreased by 20%, after years of successive growth, but unemployment has not surged, possibly due to lay-offs supported in part by the Social Security System.

As a final indicator, the Gross domestic product index lost 7.6% comparing to the prior year, with an increase being anticipated for 2021².

The continuing presence of the COVID-19 pandemic will continue to affect our lives for the foreseeable future, and those number could worsen or could get better.

So, what is our next step?

Use the building blocks to improve and change the course.

To implement new ways of doing business.

Using “old” tech adapted to the 21st Century, responding to a need created by the pandemic, using evolved software to engage in real time video meetings (something anticipated since the 1950’s, but feasible only in the first years of the 21st century).

Use delivery services and services that enables us to order a meal, produce or a book, have it delivered to our home (B2C), follow their route in real time, know their ETA (estimated time of arrival) and the name of the person that delivered it, while the payment was made through a completely digital system.

Ordering a replacement part for a machine and have one of the company maintenance persons do the repair, while being guided through a video call, by one of the manufacturers maintenance people, that is not even on the same country.

¹ https://www.bportugal.pt/sites/default/files/anexos/pdf-boletim/be_dez2020_p.pdf

² <https://www.bportugal.pt/page/projecoes-economicas>

Order a specific type of part, from a company in Italy, and have it manufactured for you in a 3D printer in a third-party office in Lisbon, bypassing (part) of the logistics process (you still need to have plastics to do the printing).

Or using 3D produced tools to improve manufacturing as VW AUTOEUROPA³ did, replacing external suppliers with internal 3D Printer to create adequate tools, with great cost savings.

Who knows if LEGO might not embrace the 3D printing game in the future.

But and the SME's that are the FOCUS of this project.

We need to show them the building blocks, how to use them. To show that they can be used in different ways. Shoe manufacturing might not embrace 3D printing, when their product is a high value, handmade product. And yet some parts of the process might be adapted.

On the other hand, more run of the mill shoes could be produced with a high degree of automation.

But either of them will benefit from Industry 4.0 logistics concepts.

And the same this might happen with glass manufacturing (mass produced or with specialist items), plastics and moulds, wood furniture (either of that Swedish brand, or by one of the more traditional manufacturers).

Our role is to show the many building blocks, that they can interact, and true innovation will come of unexpected interactions. When the building blocks create a new use and new way to it.

The following three actions were designed around that concept of building blocks, as they were built of the pasta experiences acquired during this project, but also our daily experience with innovation projects.

Three actions were selected for this regional Action plan:

1. Industry 4.0 Referential and final Innovation calls of COMPETE 2020

³ <https://www.youtube.com/watch?v=PRrUn2yrYPw>

Building on past experience and on interactions with stakeholders, partners, policy makers, a new I 4.0 referential was synthesized, and is part of sectoral policies that define the role of Industry 4.0, promote its adoption expecting to improve the competing SME's.

2. Industry 4.0 Training - Multi-SME Shared Pilot Projects

Address one of the biggest problems identified with Industry 4.0, but mainly with the preparedness of SME's the lack of appropriate training. The joint projects will promote the need training, adhering to the Sectorial priorities, expecting to develop the capabilities necessary to SME to evolve and adopt Industry 4.0 concepts.

3. Night of Industry 4.0

The final action, promoted by Ministry of Finance (HU), with other 4 partners with a simple, and yet complex goal, to promote Industry 4.0. To show how those different building blocks, or concepts can connect, to share and demonstrate how it will impact the development of SME and all the economic fabric.

The intention with these actions is clear:

- To lead any companies (SME's or non-SME's) to adopt those I 4.0 concepts.
- To adapt their investment plans, their purposes, and objectives,
- To promote the need training either in I 4.0 concepts or in any other need subject, to improve their capabilities.
- To disseminate the knowledge, to promote and reinforce the need to evolve, not by necessity but by choice.

Part I - General information

Project: Translating Industry 4.0 to improved SME policy instruments targeting innovation

Project acronym: INNO PROVEMENT

Partner organisation(s) concerned: COMPETE 2020 - Operational Programme for Competitiveness and Internationalisation

Country: Portugal

NUTS2 region: Lisboa

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INNOPROVEMENT aims at improving SME PIs targeting innovation activities and adapting them to requirements set by Industry 4.0. The project received funding in the 3rd round of calls in the Interreg Europe Programme.

Phase 1 of the project started on 01/06/2018 and ended officially on 31/05/2021.

Phase 2 of the project started in 01/06/2021 and will last to 31/05/2023.

The COVID-19 pandemic had a substantial delay on Phase 1 activities, therefore the Interreg Europe Joint Secretariat gave consent on finalising Phase 1 activities in the first months of Phase 2.

The project is implemented by a transnational consortium with the following project partners:

- Ministry of Finance, Hungary - lead partner
- ICT Association of Hungary - advisory partner
- Ministry of Industry and Trade (Czech Republic) - project partner
- Region of Thessaly (Greece) - project partner
- Marche Region (Italy) - project partner
- COMPETE 2020 – Managing Authority of the Competitiveness and Internationalisation Operational Programme (Portugal) - project partner

- Lodzkie Region (Poland) - project partner
- Regional Council of Kainuu (Finland) - project partner

The partnership of the project is clearly distinctive compared to other INTERREG EUROPE projects because - apart from the advisory partner - it is composed of managing authorities directly responsible for the policy instruments they address and they all target nationally co-financed regional or national ERDF/ESF instruments in the project.

Phase 1 had three major overlapping stages:

1. **Analysis:** all partners carried out regional assessments about the status of digitalisation and Industry 4.0 specifically for their territories. The assessment included overview on relevant statistics, analysis of concerned strategies and programmes and for most partners an online survey conducted among SMEs. From the regional assessments a Joint Analysis Report has been produced with joint observations and conclusions.
2. **Experience exchange:** This is the most important module of the project structured along 7 thematic issues. The thematic issues have been elaborated by the partnership following the same procedure: Host of each thematic issued provided guidelines on their thematic issue. Based on the guidelines, partners gathered relevant local experience with the involvement of stakeholders. The thematic issue was then discussed during thematic transnational meetings. Results of the discussions were taken home and shared with stakeholders. Summary of each thematic issue is presented in thematic papers. During the knowledge exchange good practices have been identified and presented. This structure provided the framework for sharing knowledge and practices among project partners and stakeholders. The thematic transnational meetings have taken place as follows:

	Thematic issue	Host	Place and date of meeting
1	The effectiveness of public money used to support industrial research and development under I4.0	Ministry of Industry and Trade (Czech Republic)	Prague, 12-14 March 2019
2	Introducing I4.0 to traditional industries	Regional Council of Kainuu (Finland)	Vuokatti, 17-20 June 2019
3	Definition of I4.0 public policy initiatives	COMPETE 2020 Managing Authority of the Competitiveness and Internationalisation Operational Programme (Portugal)	Lisbon, 18-20 November 2019
4	Definition of an I4.0 maturity evaluation matrix	Lodzkie Region (Poland)	Online meeting, 14 May 2020
5	Market price assessment	Ministry of Finance, Hungary	Online meeting, 3-4 November 2020
6	Innovation in software development	Region of Thessaly (Greece)	Online meeting, 11-12 May, 2021
7	Adjusting calls to Industry 4.0 requirements	Marche Region (Italy)	Online meeting, 30 June - 1 July, 2021

3. **Action Planning:** The good practices and the thematic papers provided the primary inspirations for the regional actions of project partners. Actions have been elaborated in the Regional Action Plans.

Due to delays in Phase 1 activities and closure of 2014-2020 programmes, some of the project partners opted for targeting policy instruments from the 2021-2027 programming period.

Part II - Policy context

- The Action Plan aims to impact:
- Investment for Growth and Jobs programme
 - European Territorial Cooperation programme
 - Other regional development policy instrument

The Action Plan addresses two policy instruments: the policy instrument defined in the INNO PROVEMENT application form (No. 1 in the list below), and one new policy instrument.

Name of the policy instruments addressed:

1. Competitiveness and Internationalization Operational Programme - COMPETE 2020 (2014-2020) - Portugal

Priority Axis 2: "Reinforcement of SME competitiveness and context costs reduction"

Thematic Objective 3: "Reinforcement of SME competitiveness"

Investment Priority 3.3: "SME innovation and qualification"

European Regional Development Fund (ERDF)

Schemes: Grants with the objective of strengthening SME's competitiveness through the support of technological (product and process), organisational and marketing innovation projects

2. Competitiveness and Internationalization Operational Programme - COMPETE 2020 (2014-2020) - Portugal

Priority Axis 2: "Reinforcement of SME competitiveness and context costs reduction"

Thematic Objective 3: "Reinforcement of SME competitiveness"

Investment Priority 3.3: "SME innovation and qualification"

Thematic Objective 8: "Promote sustainability and quality in work and support labour mobility"

Investment Priority 8.5: "Adaptation of workers, companies and entrepreneurs to change;"
European Social Fund (ESF)

Schemes: Grants with the objective of strengthening SME's competitiveness through the support of Training for business innovation, using real costs, or SCO's.

http://ec.europa.eu/regional_policy/en/atlas/programmes/2014-2020/portugal/2014pt16m3op001

Further details on the policy context and the way the action plan should contribute to improve the policy instruments:

Competitiveness and Internationalization Operational Programme - COMPETE 2020 (2014-2020) - Portugal - Priority Axis 2: “Reinforcement of SME competitiveness and context costs reduction” - Thematic Objective 3: “Reinforcement of SME competitiveness” - Investment Priority 3.3: “SME innovation and qualification”.

Supported by the **European Regional Development Fund (ERDF)**

This policy instrument was identified the INNO PROVEMENT project, as the most directed to SME support in terms of innovation. Although there are other policy instruments directed to SME's they intend to promote R&D efforts or the internationalization of SME's.

This Investment priority/policy instrument intends to “support productive investment of an innovative nature (e.g. at the product, process or organisational level) by SMEs, resulting in the creation and reinforcement of differentiating and quality production capacities of tradable and internationalizable goods and services with high level of national incorporation, creating opportunities for internationalisation or reinforcing the quality of the regions' business fabric, namely in articulation with RIS3 priorities.” (COMPETE 2020 Program text)

As said in the application this policy instrument intends to support projects from SME's intending to innovate either at the technological, organizational, or marketing level, introducing or applying new methods and processes, increasing the flexibility and competitiveness of SME's in the global market.

One of the main focuses of innovations are the Industry 4.0 concepts and their implementation on SME'S, which will require the integration of this policy with others”(…), promoting cooperation between higher education institutions, companies and other entities of the national innovation system, aiming at the valorisation and transfer of technology, the qualification of human resources and the development of new areas of competence (such as I4.0), where digital transformation will enable disruptive changes in business models, products, and production processes, aiming to respond to the challenges posed by the rapid technological evolution, flexibility and integration of SMEs in international value chains.” (application to INNO PROVEMENT)

Under this policy the Management Authority of COMPETE enacted the evolution and adaptation of newer calls, in an effort promote the integration of industry 4.0 on new Innovation projects, built around or with those concepts in mind, valuing adaptations or radical approaches to the implementation of these concepts.

The first action is a result of that notion of evolution, noticeably because with the 2021 revision of the Industry 4.0 Referential (first created in 2017) and applying the knowledge acquired during the analysis and implementation of investment projects, as well as including the advancements made in terms of technology, made possible the evolution of the innovation calls to a new tier, promoting the implementation of new technologies and methodologies, while focusing on I 4.0.

Competitiveness and Internationalization Operational Programme - COMPETE 2020 (2014-2020) - Portugal - Priority Axis 2: “Reinforcement of SME competitiveness and context costs reduction”; Thematic Objective 3: “Reinforcement of SME competitiveness”; Investment Priority 3.3: “SME innovation and qualification”; Thematic Objective 8: “Promote sustainability and quality in work and support labour mobility”; Investment Priority 8.5: “Adaptation of workers, companies and entrepreneurs to change;”

Supported by the European Social Fund (ESF)

With this “new” instrument policy the focus transitions to one of the main problems identified during this project. And that is training. SME’s are simply not prepared to adopt new concepts of industrialization and not prepared technologically to embrace industry 4.0. To counter this, training assumes an important role, and with this investment priority we intend to use ESF funds to promote training projects, to give specific qualifications towards competitiveness, focusing on the training of entrepreneurs, managers and workers, directing that effort to the reorganization of companies and improvement of management capabilities, focusing on increasing the specific qualifications of workers in areas relevant to the innovation strategy, internationalisation and modernisation of enterprises; Increasing business management and e-skills knowledge to support new innovation strategies and new business models; Upskilling and reskilling strategies of human resources; And promote the exchange of good practices and experiences.

The n. ° 2 action, focus precisely on this, as training projects are the necessary step for true, efficient and effective implementation of industry 4.0 concepts in SME’s, and to reap the benefits of that implementation.

Part III - Details of the actions envisaged

ACTION 1: Industry 4.0 Referential and final Innovation calls of COMPETE 2020

1.1. Relevance to the project

In April of 2017, a new Industry 4.0 referential was published. In this referential were defined the main elements for a recognizable I 4.0 strategy setting them as framework on where SME's (but not only) could support, define, and forward their development and investment projects.

Since then, 13 calls were launched and 2.200 projects with industry 4.0 elements were considered eligible, with more than a 3.578 million euros (as of June of 2021) eligible investment.

Based on that I 4.0 referential a first dedicated call was launched, the voucher I 4.0 with the main objective of providing SME's with the means to diagnose their condition in terms of Industry 4.0 concepts and identify what they needed to do to evolve into better prepared enterprises.

The follow-on calls (innovation and qualification calls) provided these companies (and other already in other stages of development) the means to develop investment projects intending to implement Industry 4.0 concepts (but not only), building on those diagnostics (supported by the Voucher calls) or on a self-diagnostic identifying problems and where to evolve and improve.

Those calls implemented various improvements namely if the project has relevant Industry 4.0 investments it will have a higher merit score and, in latter calls a higher incentive tax.

In June of 2021, a new I4.0 Referential was published, intending to support two new innovation calls (one of them targeting lower density regions) directed to industrial development projects, where Industry 4.0 has an extremely relevant place. This new referential will also be used in future calls in the next programming period.

Note: The Industry 4.0 Referential is part of the *Sectoral Policies Referentials*, which also include the Climatic Transition referential. Both referentials provide the necessary framework for future investment and public support. But as this action plan focuses more on the subject of Industry 4.0, than on climatic transition (and in effect both could benefit from an integrated approach) we will mainly refer to the I 4.0 referential.

This new referential drew inspiration from the experiences from different Innoprovement partners, namely those shared in the “live” Transnational meetings in Budapest, Prague and Kainuu and the experiences from different stakeholders, but also from the shared experiences in the subsequent Thematic meeting that were on-line.

Also, considering that technology has advanced tremendously, not only because of new and different uses, but because of the COVID-19 Pandemic, we were forced to adapt and adopt older “new technologies” as video calls or video conferencing, forcing Tech companies to deliver adequate software and evolve it at a pace unheard of until now. New developments and adaptations are showing up at a faster pace than ever.

Replacing the “in praesentia” for the on-line, stimulated that continuous development. And new “old” problems arose. How to control production, with less people on site. How to improve, how to better use this technology.

The experience shared by the stakeholders of our INNOPROVERMENT partners was important to discover “new” ways of using the same technologies, so a better concept could be synthesized, to be used as a reference in future calls.

In all honesty this process was not only driven by the project. And it could not be. Our reality is not the same as e.g., the partners of Finland or Italy. But we share some similar problems.

The I 4.0 referential arose from the directives of the Portuguese Government, from the experience gained with these calls and of our stakeholders, and as already added with the experienced shared in the project.

And those problems. Can have somewhat similar solutions, even if some adaptation is necessary.

1.2. Nature of the action

As already stated In April of 2017 the first I 4.0 referential was published, giving the necessary frameworks for all subsequent calls. In June 2021 a new referential was published creating a new framework for the final innovation calls of this programming period (here in Portuguese: https://www.compete2020.gov.pt/admin/images/Referencial_Pol%C3%ADticas_Setoriais_CE_Cl.pdf). This referential was built on the experience gained with the previous calls and on the various inputs received from stakeholders, from the Incentives Network (REDE SI), which is a coordination group that brings together regional programs and Intermediary Organisms, to discuss and prepare calls, but also monitor the execution of incentives, from the Interministerial Commission for the Coordination of Partnership Agreement (CIC Portugal 2020),

from the Ministry of Economy and Digital Transition, and from the partners of INNOPROVEMENT, which in when addressing their proposed subjects, showed their difficulties, expectations and probable solutions.

In the sixth point of the industry 4.0 referential, which is transcribed in the following paragraphs, it was defined which are the conditions for a project to considered as supporting I 4.0:

“6. In most sectors of activity, with the exception of Tourism, in order to fit into Industry 4.0, projects must integrate core I 4.0 core technologies, combining new investments in the identified technological identified technological domains with technological capacities already existing in the company, with a view to develop:

- i. Product innovation through faster product development (shorter time-to-market development (shorter time-to-market), through the application of prototyping using additive manufacturing, connected or intelligent connected or intelligent products and services, product customization to customer needs customers, and the integration of information flows between the market (customer) and production;*
- ii. Process innovation, increased productivity and flexibility in production and logistics through the use of autonomous, modular, and connected systems, supported on advanced data processing and analysis, on predictive algorithms or artificial intelligence;*
- iii. Organisational or marketing innovation, using organisational models supported on advanced data analysis or artificial intelligence systems, as well intelligence systems, as well as through the adoption of new business models supported on knowledge sharing or economic practices and models supported on user communities or on distributed value chains distributed value chains;”*

For the Tourism sector (point 7 of that referential,) it is also referred that:

“7. In the particular case of Tourism, investments oriented towards digitalisation or digital transformation in Tourism are eligible, covering the following main technologies:

- i. Products and services integrated with emotional intelligence;*

- ii. *Inclusive products and services accessible to all, including those that use wearable systems to communicate and interact with tourists;*
- iii. *Integration of products and services with virtual reality and augmented reality, in communication and marketing;*
- iv. *Applications/games with 3D scenarios and binocular composition, combining products/services with virtual reality, photography, video, sound, and text, with promotion of an immersive tourist experience;*
- v. *Development of engagement applications with tourists, allowing access, customization, and segmentation of services;*
- vi. *BI (business to Intelligence) solutions for real-time Big Data analysis;*
- vii. *IoT (Internet of Things) for connection between physical systems and online platforms;*
- viii. *Cloud for data storage."*

The two ongoing Innovation calls ([12/SI/2021 - for Interior Territories](#) & [13/SI/2021](#)) build on that referential, as they both have a specific bonus either in incentive taxes or Merit Score. (only Non-SME companies must obligatorily comply with Sectoral policies, i.e., in this case with the Industry 4.0 Referential).

All projects should include at least one of the following types of investment, besides complying to the referred access condition above (as well as the other present in the calls):

- a) *Creation of a new establishment.*
- b) *Increase of the capacity of an existing establishment.*
- c) *Diversification of an establishment's production into products not previously produced at the establishment.*
- d) *Fundamental change in the overall production process of an existing establishment.*

These calls will cover the NUT II Regions of mainland Portugal, being directed to all SME's, but also to non SME companies.

The incentive tax rate is adjustable, having a base tax of 35% to a maximum of 75%. There is a bonus of 10% to the base tax, "for SMEs with eligible investments under 15 million euros, that develop the project in the areas of Industry 4.0, where digital transformation will enable disruptive changes in business models, products and production processes, or climate transition (Sectoral Policy Benchmarks). "(quote from the 13/SI/2021 Call).

Also, the projects will have a merit score increase if they follow the investment priorities defined in the *Sectoral Policy Benchmarks*.

Note: There are other subjects, bonuses, investment types and specifics to these calls but as they do not focus on I 4.0, they will not be referred at this time.

The final specific of these calls is how the incentive is made available. The projects will receive 50% of the total through a non-refundable incentive, to be granted within the scope Innovation incentive system, while the remaining 50% will be available through an interest-free bank loan, associated to a financial instrument financed by Portugal 2020 (the Capitalizar Mais Line).

These calls have two phases:

- one that will close in 26 de July of 2021, only for beneficiaries that had registered an aid application through a former call (02/SI/2021).
- Another for those without that aid application, that will close in 20th of September.

After the close of each specific phase the projects will be analysed, evaluated, and considered eligible or not. Being considered eligible, and after signing of a contract, only it will be possible to have the first qualitative results of the new referential, mainly of the alignment of those projects with the referential.

1.3. Stakeholders involved

These are the Portuguese Stakeholders involved in this action:

- **AICEP Portugal Global - Trade & Investment Agency** is a government agency focused in encouraging the investment of foreign companies in Portugal, and to contribute to the success of Portuguese companies abroad in their internationalization processes or export activities.

The AICEP will evaluate and monitor projects with a budget of at least 25 million euros or submitted by a non-SME company (which is not the with these calls).

- **TP - Tourism of Portugal** is the national Tourism Authority, with responsibility for promoting and the valorisation and sustainability of tourism in a broad spectrum of activities.

The TP will evaluate and monitor projects to implement tourism projects.

- **The IAPMEI - Agency for Competitiveness and Innovation** - is one of the Intermediate bodies of the MA COMPETE 2020, being the agency responsible for the Clusters sectorial validation, SME support, and EU Funds support. It is also one of the Industry 4.0 Initiative stakeholders.

The IAPMEI will evaluate and monitor all other projects that fall of the above specifications.

These intermediary organisms are responsible for the analysis and monitoring of the innovation projects (submitted not only on these calls), acting on behalf of the Managing Authority COMPETE 2020, which has a supervisory role of their role.

Theses call also involve the Regional Programs, which are also Stakeholders, and share the same supervisory duties, which are:

- **Management Authority Regional Program NORTE 2020**
- **Management Authority Regional Program CENTRO 2020**
- **Management Authority Regional Program Lisboa 2020**
- **Management Authority Regional Program Alentejo 2020**
- **Management Authority Regional Program Algarve 2020**

COMPETE 2020 supervises projects with or above 5 million euros of investment, while Regional MAs supervise the remainder located in their respective regions.

All these entities contribute to the definition of conditions of the Calls, being part of the Incentives Network (REDE SI), a coordination group that brings together regional programs and Intermediary Organisms, to discuss and prepare calls, but also monitor the execution of incentives.

1.4. Timeframe

The expected timeframe is as follows:



No.	Activity	Timeframe
1	Analysis of the original (2017) Industry 4.0 referential and identifying potential ways for improvement	January 2021 - March 2021
2	Upgrading the Industry 4.0 referential using the INNO PROVEMENT experience	April 2021 - June 2021
3	Publishing the upgraded Industry 4.0 referential	June 2021
4	Collecting experience from two ongoing innovation calls relying on the upgraded Industry 4.0 referential	June 2021 - May 2022
5	Evaluation of experience from the upgraded Industry 4.0 referential including proposals for the new (2021-2027) programme	June 2022 - September 2022

The main result of the call will be an evaluation of the projects and their proposed impact on the development of the SME's but also how did the projects adhere to the I 4.0 Referential. This experience will condition future calls in the new programming period.

1.5. Costs

The related costs incurred during the preparation of the I 4.0 Referential, the preparation of the calls, and with the analysis and monitoring of approved projects are internally supported by MA COMPETE 2020, using its internal Technical Assistance budget, as COMPETE 2020 is the entity responsible for the coordination of the Incentives Network (REDE SI), and for the implementations of the call and subsequently needed tools.

1.6. Funding sources

The two innovation calls represent an incentive of 400 million, of which 340,3 million euros (ERDF) are supported by the budget defined for the Investment Priority 3.3: "SME innovation and qualification", being supported in various degrees by the Regional Programs (Norte, Centro, Lisboa, Alentejo e Algarve) and COMPETE 2020 as the next tables shows. The remainder of the planned budget (59,700 million) was reserved for another Investment priority 1.2, dedicated to non-sme's.



(Euros)

Operational Programs	Innovation Calls		Total
	PI 3.3 - SME	PI 1.2 -Non SME's	
COMPETE 2020	165 000	40 250	205 250
Regional do Norte	112 500	11 500	124 000
Regional do Centro	51 300	5 700	57 000
Regional de Lisboa	500	250	750
Regional do Alentejo	8 000	-	8 000
Regional do Algarve	3 000	2 000	5 000
Total	340 300	59 700	400 000



ACTION 2: Industry 4.0 Training - Multi-SME Shared Pilot Projects

2.1. Relevance to the project

In February of 2021 COMPETE 2020 launched five calls directed to one of the main problems identified in every meeting in the Innoprovement Project: Training.

This action has been in preparation for almost two years, and is a result of the interactions of some of our stakeholders within INNOPROVERMENT (a common theme in every Thematic and Stakeholder meeting), the intervention of the Portuguese Ministry of Economy and Digital Transition directing to implement measures to address that need, the sectorial industrial pacts and the Clusters entities, and their strategic planning, and the identified need for qualification and training to adopt new methodologies and technologies not only directed to Industry 4.0 concepts, but for a broader modernization effort.

These calls are part of a pilot initiative, designed to answer that challenge.

2.2. Nature of the action

These pilot calls were defined with a two-pronged approach to Training projects with specific training needs identified and aligned with the cluster strategy (avoiding general training needs, with a specific development target), directed in this pilot phase to 5 specific clusters:

- Footwear and Fashion Cluster;
- Automotive Cluster;
- Engineering & Tooling Cluster;
- Textile, Technology and Fashion Cluster;
- PRODUTECH (production technologies) Cluster

The first approach to these training programs is one of Joint training projects, proposed by non-profit industrial associations. These associations have the responsibility of managing a proposed training plan, prepared to address specific training needs of the cluster, in which they create classes with workers from various SME's, on specific common subjects. The joint classes are not only a cost-effective measure, but also a way to enable very small enterprises to have access to specific and specialized training to which they would not otherwise have access.

These training courses are a result of a training diagnostic made by the Clusters, and are directed to promote several themes, one of them being Industry 4.0.

These calls are part of a pilot experience intended to measure the success of joint training project, if that success is replicable to other clusters and to find out what type of adjustments will be needed to increase its range and success.

The other approach is what we call autonomous training projects, projects submitted only by one medium or bigger enterprise with a training program designed only for the needs of that specific company, but compliant with the defined training needs of the Cluster where to whom the SME belongs.

COMPETE 2020 already had experience with these types of training projects. In 2017 we launched a first training call, focusing on autonomous training projects. This call was conceived using “real costs” methodology, which means companies were supported considering only the eligible expenses made during the project and that they could prove.

In 2020 we launched a different version of the autonomous training project, conceived using SCO's (namely “Standard Scales of Unit Costs”) where it was defined a cost per hour of training for salaries of trainees and for training costs⁴. This simplified approach, reduces the administrative costs either for the program and for the companies, with the latter focusing more on the training needs and not only on fulfilling documental obligations (which still exist, but are considerably less). This approach was object of a good practice submitted to the INTERREG Website.⁵

The pilot training calls for the clusters were conceived using the experience with the SCO methodology, using the same “Standard Scales of Unit Costs”, but differ from prior training projects mainly because these training program must be validated by the Cluster association/ both on its merit and on the alignment to Cluster strategic objectives.

These pilot calls were defined with five main objectives, namely to:

- increase the specific skills of workers in areas relevant to the innovation strategy, internationalization, and modernization of enterprises.
- increase the capacities of business management and e-skills to support innovation strategies and new business models;

⁴ Annex XXI - [COMMISSION DELEGATED REGULATION \(EU\) 2021/702 of 10 December 2020](#);

⁵ <https://www.interregeurope.eu/policylearning/good-practices/item/5396/application-of-simplified-cost-options-to-training-projects/>



- Promote upskilling and reskilling strategies to adapt and specialize the human resources.
- Promote of upskilling and reskilling strategies aiming at the adaptation and specialization of human resources and their capacity to retain competences and talent.
- Promotion of dynamization and awareness actions for change and exchange of good practices (mobility and exchange of experiences).

Although these 5 calls are directed to specific industrial sectors, in one way or the other, most of the training courses should focus on the following subjects:

- Digital commerce;
- Digital transformation;
- Digitisation of production;
- Digitisation of processes;
- Cybersecurity;
- Industry 4.0;
- Circular Economy, Sustainability and Environment;
- Internationalisation.
- Agile and flexible production (additive manufacturing, robotisations, etc.);
- Manufacturing of sustainable and/or high added value products.

Not every Clusters/call will have e.g., additive manufacturing, or refer directly to industry 4.0. But most will address the same subjects, even if with different names. In cases like the footwear & fashion, the training needs will be completely different from those on the automotive cluster, both on the type of products made and on type of processes and manufacturing.

But, using leather as an example, it is one of the main raw materials for footwear, but it can also be used in upholstered seats (automotive sector). Textiles are also used to upholster seats, but also to create new clothing and possibly some footwear. But the processes used are different, being adjusted and adapted for the final use of the product. And in spite that, digital processes could be implemented, digital transformation promoted, although the different approaches to manufacturing.

This means that, even if not named, the concepts present in I 4.0 area transversely present, and that training will have to be suited to the cluster needs.

Some specific characteristics of these calls:



- They will use Standard Cost Options (SCO), namely unitary cost standard Scales applied a to trainee/hour ratio to form the eligible costs of the projects.

As the application of these unitary costs is still on its infancy, so there is an opportunity to evaluate the impacts of these measures either in administrative simplification area or in the way that trainees, trainer, and courses area validated, but also the success of directing the efforts more to the training itself, than bureaucratic processes.

- These calls will have a base incentive tax of 50% and maximum tax of 70%
- Will focus on SME located in the NUT II regions of Portugal of Norte, Centro e Alentejo.
- The training plans will only be considered eligible if the responsible cluster validates the “alignment of the project with the cluster’s collective efficiency strategy and the priority areas of the sectoral pact”.
- The length of the training projects will be between 12 (normal) to a maximum of 24 months, being that the final expenses cannot exceed 30th of June of 2023.

2.3. Stakeholders involved

The IAPMEI - Agência para a Competitividade e Inovação I.P. (Agency for Competitiveness and Innovation) is one of the Portuguese Stakeholders in INNPROVEMENT. It is also the intermediary organism, responsible for the analysis and monitoring of the innovation projects submitted (not only on these calls), acting on behalf of the Managing Authority COMPETE 2020, which as a supervisory role of their role.

This agency is also responsible for the articulation between public entities in implementing Sectorial pacts, which are the basis for defining the clusters policies and validate the entities responsible for the implementation of those policies on the ground (Clusters).

IAPMEI is also part of the Administration of some of the beneficiaries that have already or may submit projects to these calls, in which case they excuse themselves and their role is assured by the COMPETE 2020 Internal team.

Some of our stakeholders are beneficiaries of these calls, and their inputs where welcome to make the necessary adjustments to the call, to increase their effectiveness, but as beneficiaries they did not participate directly in the conception of these calls.

2.4. Timeframe

The expected timeframe is as follows:

No.	Activity	Deadline
1	Analysis of the previous training call from 2017 on autonomous training	September 2020 - October 2020
2	Developing pilot training calls using the INNO PROVEMENT experience	November 2020 - January 2021
3	Publishing 5 pilot training calls	February 2021
4	Collecting experience from the pilot training calls	March 2021 - February 2022
5	Evaluation of experience from the pilot training calls including proposals for the new (2021-2027) programme	March 2022 - May 2022

Considering that these calls focus on training we expect to evaluate the projects in two phases: The first phase refers to an evaluation of the first results of these calls, namely the expected impact of the training programs, who submitted a project to these calls (either part of a joint project or as an autonomous one), how many workers will have training and in which subjects. With this evaluation, if the pilot projects are deemed successful, they will very likely influence the next programming period choices regarding training projects, and possibly replicated in the priorities defined for new Programme for Innovation and Digital Transition in the programming period of 21-27

The second evaluation will happen after the INNO PROVEMENT has ended. In that period, we will be able to evaluate with each project final report and final survey, what were the real results and how they diverged from the proposed ones, namely quantifying the number of affected workers and if they feel better prepared after that training. This second evaluation, although not influencing the start of this programming period, will surely be taken in account in future calls.

2.5. Costs

The related costs incurred during the preparation of the calls, and with the analysis and monitoring of approved projects are internally supported by MA COMPETE 2020, using its internal Technical Assistance budget.

2.6. Funding sources

Each one of the 5 calls has a budget of 1,5 million euros which in total represents an ESF incentive of 7.5 million euros supported on the defined budget for the Investment Priority 8.5: “Adaptation of workers, companies and entrepreneurs to change;” of the COMPETE 2020 programme.



ACTION 3: Night of Industry 4.0

3.1. Relevance to the project

One common message that has surfaced from the joint analysis report of the INNO PROVEMENT partnership is that business opportunities provided by Industry 4.0 concepts and solutions are either not broadly known or not understood as an advantage for enterprises. COMPETE 2020, as a managing authority of Industry and innovations calls has indirectly experienced this, as many SME's fail to recognize the potential of I 4.0, or as in some cases implemented some concepts without being aware of their context, which means that they did not take full advantage of the concepts.

So, a need for better information and in effect, knowledge of what is I 4.0, and what it involves, arose from these observations.

The relevance of targeted awareness raising was reconfirmed in the conclusions of the Policy Learning Platform Peer Review "Shaping the Hessen Digital Transformation Support Landscape" at which Ministry of Finance of Hungary took part and represented the INNO PROVEMENT project, and as such the good practices of "Night of Industry 4.0 model factories" and "Night of Industry 4.0 model factories goes online" have been regarded project partners as inspiring.

Considering the above, and the high interest expressed by project partners, the Ministry of Finance (Hungary) started forming a pilot project proposal, based on the good practice, to enable project partners to test the "Night of Industry 4.0" approach first on a small-scale event before generalising it as good practice in future policy instruments.

5 partners have decided to apply for a pilot proposal as follows:

- Project Partner 1 - Ministry of Finance (HU)
- Project Partner 5 - Marche Region (IT)
- Project Partner 6 - COMPETE 2020 - Managing Authority of the Competitiveness and Internationalisation Operational Programme (PT)
- Project Partner 7 - Lodzkie Region (PL)
- Project Partner 8 - Regional Council of Kainuu (FI)

3.2. Nature of the action

Activities of the action in line with the pilot proposal are:

- (1) Detailed event structure and content design: building on the agendas of the previous Hungarian Night of Industry 4.0 events partners develop their regional agenda. New ideas are shared and discussed since the partnership offers great cross-fertilization ground for going beyond the original practice. This includes: timing of event, length of event, potential joint sessions during the event, terms of participation for visitors (e. g. pre-registration, pre-survey,) roles of implementing actors, feedback gathering, helpdesk, etc. For online/hybrid events it must be pre-set how the shopfloors are visited virtually (e.g., video-aided livestreams from the factories with introductions to I4.0 solutions, pre-recorded high-quality “virtual tours” of the shopfloors, mini-interviews, etc).
- (2) involvement of and arrangements with model factories (legal, financial, GDPR, IPR, security): model factories that open up their shopfloors to visitors are key stakeholders in the pilot. Their attitude and motivation for participating in such an initiative may differ from region to region. Nevertheless, the inspiring HU approach for their involvement offers a joint starting point. The model of their involvement (financial terms, rights, and obligations, GDPR, security) has to be negotiated and agreed among preparatory activities. The models will be shared by partners for mutual learning and generalisation. Beyond this, the variety of model factories with regards to their size and industries will most probably also differ from region to region based on regional specifics and needs. The various scopes will offer good opportunities for joint evaluation.
- (3) securing IT background: The events (both offline and online) need IT infrastructure (pre-registration, promotion, accompanying games, collection of feedback, etc), this has to be arranged among preparatory activities.
- (4) promotion: promotion strategy shall be made and implemented including teasers, banners, accompanying games, press releases, ex-post communication. Some of the promotion seems sensible at transnational level and details need be worked out here.

- (5) event implementation: each participating region will eventually implement one Industry 4.0 awareness-raising event based on the detailed design.
- (6) evaluation and follow-up: each partner evaluate their regional event against a pre-agreed evaluation methodology and results will be discussed jointly and put into a joint evaluation report. This will provide a strong basis for the generalisation of the measure in respective policy instruments. Other follow-up activities include ex-post communication of the event both at partner level and at joint level.
- (7) generalisation of pilot in addressed policy instruments: in case of success, partners integrate the measure in their policy instrument. Way of integration will be most probably different due to varying implementing structures but the general guideline here is a measure/programme/project in the policy instrument that includes the technical content of the event and earmarked budget with regular occurrence. Partners will discuss the generalisation with their concerned stakeholders and ensure the integration of the tested measure with needed-finetuning based on the piloting experience.

According to the lead partner, “This pilot offers three relevant upgrading opportunities: transnationality, learnings from partners’ pilot events and the hybrid event format. The primary added-value of the pilot is transnationality, which will bring added-value to the current practice at least in the two following aspects.”

Regarding COMPETE 2020, if this pilot project is deemed successful it will be integrated in the future “Programme for Innovation and Digital transition” in the new programming period of 21-27, being incorporated in the technical assistance budget in order to support the dedicated instrument for innovation policy, as it is not considered as a direct support measure to SMEs, but in fact is an event to support the diffusion of Industry 4.0 in support of those policies. As the new program is still in negotiation, this initiative will be supported by the Innovation policy of MA C2020.

The MA of COMPETE 2020 is also responsible for the management of the Incentives Network, which involves all the MAs for regional programs (Norte, Centro, Lisboa, Alentejo e Algarve) and the management of all public incentive instruments for SME’s, which means that if this Pilot Action is successful, it may be replicated by all the intervening MAs with regional and national impacts.

But considering the Hungarian experience with this good practice, COMPETE 2020 will have to adapt it to the Portuguese entrepreneurial reality.

At this planning stage we intend that the event will have a hybrid format, i.e. both online and on site, involving two model factories of two different activity sectors (not yet selected) where different technologies and approaches can be demonstrated and documented either using e.g., augmented reality where possible, or using simpler approach as a visit to the factory floor.

We also expect to create synergies with other I 4.0 activities or industries in those regions, having them share their experiences as small videos or webcasts.

Beyond the virtual and or real visits to the model factories, we intend to demonstrate how to use and shape the quality of information to make better decisions in the medium to long term development of enterprises, This means showing how to use I 4.0 concepts, to gather information and which are the best investments, considering each industrial sectors. I.e., we intend to show how different building blocks may interact with each other, and which are the best suited for each company.

We expect to involve the MAs of regional programs in this effort (considering the location of the model factories) as well as the AICEP, IAPMEI and Turismo de Portugal (TP), COTEC Portugal, (as one of the promoters of I 4.0 solutions) and some industrial associations.

3.3. Stakeholders involved

These are the Portuguese Stakeholders we intend to involve in this action (as we are in a planning stage):

- **IAPMEI - Agency for Competitiveness and Innovation** - is one of the Intermediate bodies of the MA COMPETE 2020, being the agency responsible for the Clusters sectorial validation, SME support, and EU Funds support. It is also one of the Industry 4.0 Initiative stakeholders.
- **COTEC Portugal** - COTEC Portugal (<http://www.cotecportugal.pt/pt/>) is one of the main business associations for innovation and technological cooperation. COTEC involves multinational companies, large national groups and SMEs in various sectors of activity.
- **Industrial Associations (yet to be determined).**

As we are in the planning stage of the Pilot project, we will have the cooperation of the stakeholders in preparing, promoting, and developing “The night of industry 4.0” in Portugal.

Their knowledge of the Portuguese entrepreneurial context will enable to define a directed event to companies which need to improve or implement I 4.0 in order to survive and to evolve.

3.4. Timeframe

The time needed to implement the action is 6 months starting in September 2021 and ending in February 2022. The planned schedule is included in the following table.

No.	Activity	Deadline
1	Detailed event structure and content design	September - October 2021
2	Involvement of and arrangements with model factories	September - October 2021
3	Securing IT background	September - October 2021
4	Promotion	October 2021
5	Joint methodology for evaluation	October 2021
6	Event implementation	November 2021
7	Evaluation	December 2021
8	Follow-up	December 2021 - February 2022
9	Generalisation of pilot in addressed policy instruments	December 2021 - February 2022

3.5. Costs

Costs related to the implementation of the action are estimated in the table below.

No.	Type of cost	Volume
1	Staff costs COMPETE 2020 Staff of 3 with 0.25 of their time on the project for 6 months at monthly wage cost of EUR 2.250 = EUR 13,500	EUR 13.500
2	Office and administration (COMPETE 2020 only):	EUR 2.025
3	External expertise <ul style="list-style-type: none"> • Promotion: EUR 3,000 • Content generation: EUR 13,000 • External legal counselling: EUR 1,500 	EUR 14.500
	Total	EUR 29 525

3.6. Funding sources

The Night of Industry 4.0 will be financed through the Ministry of Finance Hungary and ICT Hungary request for funding for the pilot costs from the Interreg Europe Programme.



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Date: 30th of November of 2021

Name of the organisation:

Management Authority COMPETE 2020 - Operational Programme for Competitiveness and Internationalisation

Professor Nuno Mangas,

Chairman of the Board

Management Authority COMPETE 2020

**COMPETE
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