

# NMP-REG

Interreg Europe

NMP-REG aims at improving regional policies for the delivery of innovation in nanotechnologies, new materials and new production technologies (NMP), to the manufacturing sector.

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An interregional cooperation project for improving innovation delivery policies

## NMP-REG ACTION PLAN FOR TUSCANY REGION

Project partner: ASEV



Research & innovation



European Union  
European Regional  
Development Fund

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## Part I – General Information

### About the NMP-REG Project

Nanotechnologies, new Materials and Production technologies (NMP) represent a group of technologies with innovative impacts on a wide range of industrial sectors. They are an important part of the so called “Key Enabling Technologies” (KET), considered by the European Union (EU) of strategic importance for regions to manage a shift to a knowledge-based economy<sup>1</sup>. The EU believes these technologies can reverse negative growth trends in manufacturing and foster growth and jobs.

The statements are clear, but the road from intent to transfer, application and exploitation of NMP in manufacturing is long. NMP is dealt with in research. However, the common challenge is ensure that innovation actors cooperate to deliver research results to the manufacturing sector, with subsequent benefits for regional growth.

This is the context of NMP-REG (Delivering Nanotechnologies, advanced Materials and Production to REGIONal manufacturing), a European Territorial Cooperation project co-financed by the European Regional Development Fund (ERDF), through the INTERREG EUROPE Programme.

NMP-REG groups seven partners from five regions located in five different countries<sup>2</sup>, who are facing this regional development challenge together. Their overall objective is to improve regional policies for delivery of innovation in NMP to manufacturing. NMP-REG focuses on policy actions that can support innovation delivery, using coordinated action from key players.

NMP-REG achieves this through exchanging experiences and good practices in a framework of interregional activities, communication and stakeholder engagement. In this context, partners develop Action Plans that result in improved policy instruments supporting NMP-based innovation in each of the regions participating in the project.

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<sup>1</sup> Communication "Preparing for our future: Developing a common strategy for key enabling technologies in the EU" COM(2009)512

<sup>2</sup> NMP-REG partners from Norte (Portugal): CCDR-Norte (Norte Regional Coordination and Development Commission) and INL (International Iberian Nanotechnology Laboratory); from Tuscany (Italy): ASEV (Agency for the development of the Empolese Valdelsa); from Flanders (Belgium): FIE (Flanders Innovation and Entrepreneurship); from North Rhine-Westphalia (Germany): NMWP.NRW (NanoMicroMaterialsPhotonics.NRW Cluster); from Bucharest-Ilfov (Romania): UEFISCDI (Executive Agency for Higher Education, Research, Development and Innovation Funding) and UPB (University Politehnica of Bucharest).

## About the Tuscany NMP-REG Action Plan

Each region participating in NMP-REG produces one Action Plan, providing details on how the lessons learnt from the interregional cooperation will be exploited in order to improve the policy instrument tackled within that region.

This document is the NMP-REG Action Plan for the Tuscany region. It was drafted by ASEV (Agenzia per lo Sviluppo Empolese Valdelsa), under the supervision of the Managing Authority of the ERDF Tuscany Regional Operative Programme (ROP) 2014-2020 and with the contribution of several stakeholders coming from the regional Technology District for Advanced Materials.

The development of this Action Plan has been based on the principles of:

- i. **interregional cooperation between NMP-REG partners:** cooperation was supported by a series of interregional learning events (ILE), bilateral exchanges of experiences and share of good practices
- ii. **involvement of the main Tuscany stakeholders** dealing with NMP research, development and innovation delivery to regional industry: participation was supported mainly through setting up a Regional Stakeholder Group (RSG), which met periodically (at least twice each semester) in order to guide the project. RSG was composed by entrepreneurs and researchers members of the regional Technology District for Advanced Materials and by representative of the Tuscany Region (managing authority ROP FESR, S3 Observatory)

This document is structured in four parts.

After this introductory section, the second part provides an overview of the territorial context and the policy instrument addressed by the Action Plan. The third part provides an overview of the actions envisaged by the Action Plan. The fourth part corresponds to the main part of the Action Plan, where each action is presented, specifying its background, activities, players involved, timeframe and costs.

<b>Project</b>	<b>NMP-REG: Delivering Nanotechnologies, advanced Materials and Production to REGIONAL manufacturing</b>
<b>Partner organisation</b>	ASEV – Agenzia per lo Sviluppo Empolese Valdelsa
<b>Other partner organisations involved (if relevant)</b>	None
<b>Country</b>	Italy
<b>NUTS2 region</b>	TUSCANY
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## Part II – Policy context

This section includes a brief overview of the territorial context and the policy instrument addressed by this action plan.

The geographical coverage of the Action Plan is the Tuscany NUTS 2 region (Italy).

### About Tuscany Region

#### TUSCANY IS A LARGE AND INDUSTRIAL REGION...

Tuscany is the fifth largest region in Italy, with a surface of 22.897 Km<sup>2</sup>, about 3,74 million inhabitants (2018), with a greater number of residents in the metropolitan area of Florence and the major cities (Pisa, Livorno, Pistoia, Arezzo) located in the Arno valley, more than 1,6 million employees (6,8% of the whole Italy, + 3,7% in 2017), around 355.000 active enterprises and a GDP of 115 billion of euro that corresponds to 6.7% of the whole nation, but with a GDP quota per inhabitant (30,75K€) lower than that of other areas of the country (Tuscany is 8°).

#### ...WITH A WIDE EXPORT ORIENTATION ...

Alongside tourism, Tuscany covers about 7,5% of Italian exports of which 48% to the European Community: particularly Germany (13%), France (10.8%), United Kingdom (7%), Eastern Europe (11%). More than 17% of the goods exported from Tuscany go to the US market (compared to Italy's 11% share). Among the remaining international areas, South America, the Middle East and Japan together account for about 11% of total exports. Tuscany brand particularly affects fashion (textile, clothing, leather) and metalworking, which represent the sectors with the greatest openness towards foreign countries, followed by the jewellery and other manufacturing sectors.

#### ... WITH HIGH LEVEL ACADEMIA AND MANUFACTURING EXCELLENCES ...

Tuscany is land of **high scientific excellences in research** – with 5 academia located in Pisa, Florence and Siena and several National Research Council institutes - **world-leading brands** operating in fashion (PRADA, GUCCI, FERRAGAMO, DOLCE&GABBANA), yachting (AZIMUT BENETTI, PERINI), ceramics and paintings (COLOROBIA, CROMOLOGY), medicine (MENARINI, GSK, PHILOGEN) and a wide **consolidated manufacturing and craft skills**. However, more than 90% of the industrial system is densely fragmented in SMEs (60% with fewer than 15 employees) with prominent difficulties to:

- access to new knowledge and technological developments
- invest in innovation and qualification of personnel
- industrially valorise R&D results

**...AND THE FOLLOWING “SWOT” ANALYSIS CONCERNING NMP SECTOR**

The global market of advanced materials was about 43 billion dollars in 2017 and it is estimated to reach 102 billion dollars by 2024, with an average annual growth of 10%<sup>3</sup>. The potential offered by NMPs are almost infinite and falls within a multidisciplinary area, with frequent intersections with other areas such as Optoelectronics, Life Sciences, Fashion and Textiles, Renewable Energy, Mechanics, Paper, Stone.

During the last two decades Tuscany Region has intensely invested in technological transfer policies, aiming to fill the gap between research and industry. In 2010 was decided to start investing in NMP, addressing the first measures to support the transfer of these new technologies and then (2016) to include the theme of "Advanced Materials" in the policies for the creation of Regional Technological Districts.

Below is a brief SWOT analysis about Strengths, Weaknesses, Opportunities and Threats of a regional policy aimed at supporting the delivery of NMP in the Tuscan production context

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>- Presence of high scientific excellences, with several public-private research groups qualified at international level and in multidisciplinary sectors</li> <li>- Consolidated manufacturing and craft skills in several sectors such as: textiles, leather, glass, ceramics, mechanic, agro-food</li> <li>- Growth of enterprises in the advanced manufacturing sector</li> <li>- Ongoing collaborations between research and industrial production in different sectors.</li> <li>- Industrial capacity to address market requests with an increasing quality of their products.</li> <li>- High rate of innovation by NMP applications in manufacturing (new products and processes)</li> <li>- High rate of creativity, flexibility, adaptability by NMP applications</li> <li>- Relatively low cost of research for NMPs</li> <li>- Regional presence on several EU platforms and interregional networks</li> </ul>	<ul style="list-style-type: none"> <li>- Weak dialogue between research and SMEs.</li> <li>- Multidisciplinary features of NMPs needs a professional capacity to merge and integrate skills and business interests</li> <li>- Low level of private investments in research and development, especially in SMEs.</li> <li>- Need to train the workforce in the use of new technologies</li> <li>- Weak channels of financial engineering to support high risk/ high gain innovation.</li> <li>- High costs for laboratory infrastructures and their updating.</li> <li>- Small and sectorial dimension of the manufacturing industries</li> <li>- Barriers and high cost for scaling-up new materials from laboratory to industrial process (gap from TRL4-6 to TRL7-9).</li> <li>- Lacks of data concerning toxicity of (nano)materials and their long-term effects (health, bio distribution, degradation, etc)</li> <li>- High (nano)materials production costs.</li> </ul>

<sup>3</sup> <https://www.transparencymarketresearch.com/advanced-materials-market.html>

Opportunities	Threats
<ul style="list-style-type: none"> <li>- Exploiting industrial and academic research in several sectors (agro-food, health, chemical and pharmaceutical, construction and cultural heritage, textiles, fashion and luxury items, transportation, automotive and nautical, electronics and sensors).</li> <li>- Launching and supporting research that promotes multidisciplinary as a lever for innovation and growth</li> <li>- Increasing attention to environmental impact of processes and products: alignment with EU strategies and the emerging markets related to environmental remediation and Circular Economy.</li> <li>- Creation of new spin-off and start-up.</li> <li>- Relaunching the competitiveness of traditional sectors through innovation</li> <li>- Creation of new job opportunities (or saving of existing ones) and professional profiles</li> <li>- Arising of new products and business opportunities, business diversification, etc.</li> <li>- Increasing consumer awareness about the quality of products, their manufacturing process and their geographical origin.</li> </ul>	<ul style="list-style-type: none"> <li>- The continuing economic crisis can further discourage private investment in research</li> <li>- High competitiveness of global big players in several sectors: need of structural investments to maintain the competitiveness</li> <li>- Low level of funds for public research by national government.</li> <li>- Lack of regional and national innovation policy supporting industries, operating in mature sectors, willing to diversify their business.</li> <li>- Insufficient data and rules on the nanomaterial impact on human health and environment causes a bad mood in public opinion.</li> <li>- Difficult to obtain high reliability and production costs too high for a single (small) industry.</li> <li>- Too high concentration of funds for professional figures with fixed-term contracts</li> <li>- Bureaucracy and complexity of the calls for research and innovation projects.</li> <li>- Obstruction in speeding up the creation of new standards for the new technologies and common approaches for classification, metrology, characterisation of nanomaterials.</li> </ul>

## Policy instruments addressed by Tuscany Region

Within EU Cohesion Policy, different operational programmes support projects in Tuscany, covering a wide range of regional development needs.

This Action Plan is **firstly focused** on improving the running **Tuscany ERDF Regional Operational Programme (ROP) 2014-2020** (also called [POR CREO FESR 2014-2020](#)), with a specific focus on the Axis 1 and several related measures.

Axis 1 aims to “*Strengthening research, technology development and Innovation*” and supports business investment in innovation and research developed in synergy with research centres, universities, and Technology Districts (technology-thematic specific clusters). The objective is fostering product and process innovation of enterprises, industrialization of research results, innovation delivery, pilot lines, early product validation actions and demonstrators. . Measures aim to achieve these objectives by funding the purchase of innovative services and investment in innovation, supporting Technology Districts and research infrastructures as well as deploying financial engineering instruments.



All these actions must be developed **in accordance with** the priorities and technological roadmaps set out in **the regional [Smart Specialisation Strategy \(RIS3\) 2014-2020](#)**, which represents both ex-ante condition and technical annex of the ROP ERDF 2014-2020, as from the decree of the regional council n°1018 of 18<sup>th</sup> November 2014. This means that each call, as well as measure or action, funded by ROP ERDF must be addressed to at least one RIS3 priority

Due to this mandatory relationship between the addressed policy instrument and the **regional [Smart Specialisation Strategy \(RIS3\) 2014-2020](#)**, this Action Plan cannot deal solely with the improvement of the addressed policy instrument but requires at the same time the integration of the update of the RIS3 for Tuscany as an additional action.



According to the EU COM(2010)553 “Regional Policy contributing to smart growth in Europe 2020”, RIS3 is the agenda for the economic transformation of a given region, aimed at exploiting its development potential, leveraging technological excellence. As such, **RIS3 represents the regional strategy document for innovation and research** where the Regional Authority identifies investment priorities and technological domains (development roadmaps) for regional policies and structural fund programming.

The first version of RIS3 Toscana 2014-2020, elaborated in 2013, fixed 3 priority technological pillars (ICT and Photonics, Smart Factories, Chemical and Nanotechnologies) under which several technology roadmaps were identified.

<b>Name of the policy instrument addressed</b>	<b><u>Tuscany Regional Operative Programme (ROP) 2014-2020</u></b> / Axis I - Strengthening research, technology development and Innovation / Priority 1b (several measures)
<b>Investment for Growth and Jobs programme</b>	YES
<b>European Territorial Cooperation programme</b>	NO
<b>Other regional development policy instrument</b>	YES <b><u>Tuscany Smart Specialisation Strategy (RIS3 2014-2020)</u></b> / Technology priority “Chemistry and nanotechnology”

## Part III –Overview of the Actions Envisaged

This section includes a brief overview of the actions included in the Action Plan. These actions were drafted according to a set of broad guiding principles:

- **Stakeholder inputs** - The actions aim at tackling specific regional challenges and needs identified during the Regional Stakeholder Group meetings organised by ASEV during the NMP-REG Phase 1.
- **Interregional learning process** - The actions aim at drawing on the lessons learnt from the different interregional exchange activities carried out thanks to NMP-REG. Several interregional events were also attended by regional stakeholders, in particular by representatives of the managing authority
- **Policy instrument improvement** - The actions focus on achieving improvements in the specific policy instrument(s) selected for Tuscany within NMP-REG.
- **Feasibility** - A limited number of actions was defined and their scope was controlled, in order to increase the likelihood of their implementation in most activities, without compromising the purpose of the Action Plan and of the NMP-REG mission.

NMP-REG aims to “*improving regional policies for supporting the innovation delivery of NMP to manufacturing*”. The NMP-REG Action Plan for Tuscany consists of **two complementary actions** closely linked to the project's objectives:

<b>ACTION 1</b>	<p><b>Increase the relevance of NMPs in the investment priorities of regional policies for research and innovation</b>, namely by capitalising on the stakeholder dynamics and interregional learning process brought by the NMP-REG project in a parallel review and updating process of the Tuscany RIS3 2014-2020 related to NMP applications.</p> <p><b><u>In ACTION 1 the focus is specifically on NMPs</u></b> and we aim to <i>a change in the strategic focus of the policy instrument (Type 3) and implementation of new projects (Type 1)</i> by improving the Tuscany RIS3 2014-2020.</p> <p><b><u>Implementation has already started in Phase 1</u></b></p>
<b>ACTION 2</b>	<p><b>Improve the innovation delivery of NMPs by supporting cross-cluster multidisciplinary initiatives and strengthening cluster policies</b>, namely by benefiting from the several skills and experiences of cluster policies deepened in the NMP-REG project.</p> <p><b><u>In ACTION 2 the focus is on innovation delivery</u></b> policies (and the high relevance of multidisciplinary and cross-sectoralism for NMP applications) and we aim to <i>a change in the management of the policy instrument (improved governance) (Type 2)</i> by a better use of tools and expertise theoretically already available, but under used by the MA.</p> <p><b><u>Implementation is going to start</u></b></p>

## Part IV –Details of the Actions Envisaged

This section presents the actions elaborated in Phase 1 of the NMP-REG project.

For each action there is an identification of the needs it addresses, the policy improvement it aims for, the lessons from the project supporting it, and of its activities, players, timeframe and costs.

### ACTION 1

**ACTION 1 - Increase the relevance of NMPs in the investment priorities of regional policies for research and innovation**

#### OVERVIEW of the proposed policy improvement

NMPs (Nanotechnologies, Advanced Materials, Advanced Manufacturing and Processing) represent one of the Key Enabling Technologies highlighted in the EU Communication 512/2009 and are considered a priority technological axis for the industrial policies of Europe 2020. The global market of the advanced materials alone was about 43 billion dollars in 2017 and it is estimated to reach 102 billion dollars by 2024, with an average annual growth of 10%.

However, only in 2013 NMPs were identified as key technologies for the development of the regional production system and were included in the first release of the Tuscany **Regional Smart Specialisation Strategy (RIS3)** within the three priority technological “pillars” on which to address ROP ERDF 2014-2020 funds and measures for supporting research and innovation. Identified priority pillars are:

1. ICT and Photonics
2. Smart Factories (which includes Advanced Manufacturing and Processing)
- 3. Chemical and Nanotechnologies** (which includes Advanced Materials)

Each priority pillar is then structured in several "technology roadmaps" of investment that outline the main opportunities in research, development and innovation: industrial research roadmaps, innovation roadmaps, system intervention roadmaps.

As reported in Part II of this document, **Tuscany ROP ERDF 2014-2020 funds only activities and projects addressed in accordance with the priorities and roadmaps set out in the regional Smart Specialisation Strategy (RIS3). This means that each call** (as well as measure or action) funded by ERDF **must be addressed to one or more of them** (DGR n° 1018, 18 November 2014).

**In 2017**, in accordance with the EC provisions which within 2018 requires a review of the strategic documents presented at the beginning of the programming period 2014-2020 (but also in order to update the regional strategy for the post-2020 programming period), **the ROP ERDF managing authority launched a participatory process** with entrepreneurs and researchers in

order **to review and update own RIS3**. This was done in a parallel process to the NMP-REG project.

At this purpose, **ASEV** as NMP-REG Lead Partner and managing entity of the regional Technological District for Advanced Materials **has been formally charged by the Tuscany Managing Authority** to coordinate the reviewing process **for the NMP sector** in order to:

- A. identify the technologies to be developed and on which to invest in the next 3-5 years (technological roadmaps) including the remaining programming period 2014-2020 in the field of NMP,
- B. highlight the sectoral and also territorial areas of application,
- C. draft the time targets for the development and adoption of the technologies (targets, times, critical factors), also considering TRL (technology readiness level) and MRL (manufacturing readiness level) factors,
- D. identify the major regional stakeholders in research and industry,
- E. benchmark the international positioning (stakeholders / competitors) at national and international level.

In this context, **ASEV took the opportunity to couple the RIS3 review process with the NMP-REG learning process**, merging regional needs with possible solutions proposed/highlighted by the interregional cooperation: many of them have been following implemented within the 7 “technological roadmaps” released to be included in the new updated RIS3, particularly concerning: “Materials for high-performance nanostructured surfaces and composites” and “Materials for active and smart surfaces and composites” with applications in manufacturing, building, agri-food and medicine sectors.

In brief, the role of **ASEV and its NMP-REG regional Stakeholders Group** was:

1. Supporting the exchange among entrepreneurs and researchers in order to identify the **technological roadmaps** that better match with the productive vocations and skills in the area and well addressing innovation delivery of NMP to manufacturing.
2. Realising a contribution document for the NMP Sector to be included in the reviewed RIS3 2014-2020 and containing the new (or updated) roadmaps together with a survey of the above information.

**For the sake of the clarity**, several activities of “action implementation” took place in Phase 1 in the time period March 2017 – January 2019, but with a clear distinction from the project activities for the “action elaboration”.

**Action elaboration activities** [using INTERREG EUROPE funds and benefiting of the NMP-REG interregional learning process] started since the project kick-off and continued until the 6th semester of the project with the planned exchange sessions at regional and interregional level: Interregional learning events, study visits, technical meeting and exchange session on identified practices or external experiences, mid-term event. Elaboration activities are been step by step described in the Phase 1 reporting period documents.

**Action implementation activities** [using ROP ERDF 2014-2020 funds and in-kind resources, but not INTERREG EUROPE funds] started in late summer 2017, initially with a partial overlap with the regional events foreseen by the NMP-REG learning process at regional level: for example, during the NMP-REG stakeholders meetings, by including a dedicated session on RIS3 and its relevance in affecting ROP ERDF or introducing a focus session about “how to improve running RIS3” after the presentation of the NMP-REG good practices. Implementation activities are following described.

**Implementation activities concerning the RIS3 2014-2020 document reviewing and updating have been formally concluded in late February 2019** with the publication of the notes for updating the new RIS3 2014-2020 by the **Regional Council resolution n ° 204 of 25<sup>th</sup> February 2019**.

**This action, however, will continue in Phase 2 with a deepen monitoring activities** in order to evaluate the effectiveness of its application and the impact on the remaining calls of the programming period 2014-2020 as well as in the management of the axis and measures for supporting research and innovation.

At this purpose, RIS3 has not own monitoring indicators and procedures: it borrows the same ones adopted by the ROP ERDF 2014-2020.

**Chance to see this implemented**

High with core of activities completed in Phase 1.

The activities took place during March 2017 - February 2019. All activities for the RIS3 2014-2020 review and update (improvement) will be formally concluded with the publication of the new RIS3 2014-2020 by the Regional Council resolution in February 2019.

In Phase 2, monitoring activities are scheduled in order to evaluate the effectiveness of its application and the impact on the remaining calls, measures and axes of the ROP 2014-2020.

NOTE: ONLY activities for development funded using INTERREG funds and through (coupled with) the NMP-REG interregional learning process, while activities for implementation have been funded using ROP 2014-2020 (grant allocated to each technological district) or in kind funds.

**NEEDS addressed**

Since the first technical meetings with the NMP-REG Stakeholders Group have shown that many **companies (including their trade associations), entrepreneurs and policy makers do not yet have a real knowledge of the possible NMP applications** to manufacturing, nor an awareness of their "disruptive" potential with respect to the development of new products and new

processes capable of boosting the competitiveness of companies even in traditional and "mature" sectors. This lack of awareness is also reflected in the ROP ERDF 2014-2020 which, however, in terms of technological development objectives and applications eligible for funding, makes full reference to the Smart Specialisation Strategy (RIS3).

Nevertheless the Tuscany RIS3 2014-2020, despite since the first version developed in 2013 identifying NMPs as one of the three technological pillars **on which to address ERDF funds for research and innovation**, has several "gaps" in the technology roadmaps it includes.

In particular:

- although well integrated in the strategy, the potentials of the **NMPs were not adequately deepened, detailed and combined with the regional** (innovative and traditional) **productive vocations and research skills**,
- the development of the **first RIS3 document** had been **restricted to a limited number of stakeholders** that, however competent, could not fully grasp the potential of the new instrument and its subsequent influence on the ROP measures,
- after the first years of use (2014-2017), due to the quick evolution of technology and innovation, **RIS3 needs to be reviewed and updated**.

In order to meet these needs, Action 1 aims to improve the ROP 2014-2020 by improving the Tuscany RIS3 2014-2020. Specifically it aims to *a change in the strategic focus of the policy instrument* (Type 3) and *implementation of new projects* (Type 1).

## Background

<p><b>Policy context and regional inputs</b></p>	<p><b>Key inputs</b> for the action implementation resulting from the NMP-REG regional meetings and policy context:</p> <ul style="list-style-type: none"> <li>• <b>RIS3 represents the regional strategy for Research and Innovation</b> that all Member States and Regions are requested to adopt according to the EU regulations, identifying priority technological domains for regional policies and the planning of European structural and investment funds.</li> <li>• The <b>first Tuscany RIS3 document was approved</b> by the Regional Council resolution n°1018/2014 and then approved by the European Commission by decision C (2015) n. 930 of 12 February 2015, <b>together with</b> the approval of the Tuscany Regional Operational Program for the use of the 2014-2020 ERDF funds (<b>ROP 2014-2020</b>).</li> <li>• <b>By the decree</b> of the Tuscany regional council n°1018 of 18<sup>th</sup> November 2014, <b>ROP ERDF 2014-2020 funds only</b> activities and</li> </ul>
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	<p>projects that are <b>consistent with</b> the priorities and technology roadmaps set out in the <b>RIS3</b>. This means that each call funded by ERDF must be addressed to one or more RIS3 priority</p> <ul style="list-style-type: none"> <li>• <b>NMP-REG regional Stakeholders Group</b>, mainly composed by entrepreneurs coming from several production sectors and NMP expert researchers, <b>highlighted a lack of knowledge of NMP applications</b> among Tuscan entrepreneurs and their representatives</li> <li>• This <b>lack was mainly due to</b> the sudden changes in innovation and evolution in applied research, but also to the incredible vastness of NMP applications for the development of new products and processes</li> <li>• Nevertheless, <b>policy instruments can also make up for this lack</b>: particularly RIS3 2014-2020 need to be review and updated concerning NMP applications and technology roadmaps for the regional development</li> <li>• In spring 2017, the <b>regional authority launched a participation process</b> (<a href="https://bit.ly/2qsExD1">https://bit.ly/2qsExD1</a>) structured in more steps for the reviewing and updating of the running RIS3.</li> <li>• In summer 2017 the <b>ROP ERDF managing authority formally charged</b> ASEV together its regional Technological District for Advanced Materials (<b>NMP-REG Lead Partner and stakeholders group</b>) for reviewing the regional strategy concerning the NMP sector</li> </ul>
<p><b>Interregional inputs</b></p>	<p><b>For the whole Phase 1</b> the Tuscany <b>NMP-REG Stakeholders Group</b> (managing authority, entrepreneurs, researchers) <b>participated to the NMP-REG learning process</b> (Interregional Learning Events, study visits, good practices presentation and bilateral exchange actions) remaining impressed by the cluster organisations and several application contexts in manufacturing production process (running experiences and practices) such as:</p> <ul style="list-style-type: none"> <li>- <b>INL</b> (International Iberian Nanotechnology Laboratory) experience from Norte, particularly concerning "nano-chemistry" (catalysis, synthesis and research of materials, for example, for novel magnetic nanoparticles for biomedical area, more efficient thermoelectric for cooling, effective water treatment) and the "fabrication and exploratory nanotechnology" (MEMS/NEMS, spintronic, microfluidics, graphene and thin film semiconductors, energy storage, advanced packaging).</li> <li>- <b>Cluster organisations</b>, such as <b>CENTECH</b> (nano-analytical tools to</li> </ul>

analyse nanomaterials with respect to function, surface and composition), **COPT** (where they deepen emerging technologies such as TOLAE - Thin, Organic, Large Area Electronics - for advanced products in large area electronics that are thin, light weight, flexible and/or stretchable, suitable for large market sectors such as the textile, automotive, health, paper, plastic, advertising or construction industries), and **FLANDERS MAKE** (whose experience also paves the ground for open innovation test beds, included in new Tuscany RIS3), from NRW and Flanders

- The **ICON projects** (from Flanders) as first "policy" attempt to join research and industry since the basic research (some application projects with manufacturing SMEs were deepened with Flemish partners during the focus exchange sessions, but what particularly impressing was the possibility of addressing research towards industrial objectives from the very beginning.
- Relevant study visits such as the ones in Braga at **CeNTI** - Centre for Nanotechnology and Smart Materials and **CITEVE** - Technological Centre for the Textile and Clothing Industries of Portugal

**Several cases of NMP's applications** to the manufacturing industry emerged from the in-depth analysis on each of these practices. As consequence, as many research and development themes, innovation delivery tools, successful application cases of NMP in manufacturing processes and products in partner regions:

1. Firstly have rapidly become the subject of discussion at regional level during the Stakeholders Group meetings,
2. Then they became seeds on which to sprout ideas and proposals consistent with the innovation needs of the regional manufacturing system,
3. Finally, many of them have been developed in "roadmaps" (according to the model recognized by the Tuscany Region) to be included in the following implementation action for reviewing the RIS3.

In Jan 2018, NMP-REG organised the **NMP-REG Mid Term Event** in Leuven, **specifically focused on "Consolidating NMP in updated European RIS3"** where competences and roadmaps were shared and debated with other 8 EU Regions and representatives coming from DG REGIO, DG GROWTH, ERRIN and WATIFY network. The event was



attended also by the ROP ERDF Managing Authority and S3 Observatory representatives (see under).

From this, Tuscany has benefited from the opportunity for a benchmarking between the RIS3 of EU regions in terms of investment strategies in the NMP sector and, more generally, of key enabling technologies (KET).

### Action concept and Specific Activities (mainly completed in Phase 1)

Following up on the above, please consider that:

1. Several implementation activities took place in Phase 1 in synergy with the elaboration activities of this Action. They are here described for the first time as such.
2. For a proper description of the RIS3 reviewing and updating process, as well as for a proper understanding of the implementation activities that are still ongoing or need to be done in the next couple of years, the whole of the activities (elaboration and implementation ones) are listed below together.
3. For each group of activities, where doubt might arise, we tried to distinguish the elaboration from the implementation one.
4. Description focuses on NMP sector, where ASEV and its NMP-REG Stakeholders Group (SG) had an active role also in several implementation activities, **using ROP ERDF 2014-2020 funds or in-kind resources (not INTERREG funds)**. For each activity is specifically highlighted the role of the NMP-REG team in order to increase the relevance of NMPs in the ERDF investment priorities of the regional policies.

Activity n°	Activity Description					
A1	<p><b><u>Ex-ante analysis and assessment</u></b></p> <p>The review process began with an analysis and evaluation of the results obtained from the first version of the Strategy elaborated in 2013. ASEV and NMP-REG SG were involved in order to provide the results achieved for the NMP sector during the time period 2013-2016, together with a SWOT analysis (strengthens, weakness, opportunities and threats).</p> <table border="1" data-bbox="268 1736 1423 1915"> <thead> <tr> <th data-bbox="268 1736 853 1803"><u>Elaboration</u></th> <th data-bbox="853 1736 1423 1803"><u>Implementation</u></th> </tr> </thead> <tbody> <tr> <td data-bbox="268 1803 853 1915">This activity fully lies within the elaboration process of this action</td> <td data-bbox="853 1803 1423 1915">None</td> </tr> </tbody> </table>		<u>Elaboration</u>	<u>Implementation</u>	This activity fully lies within the elaboration process of this action	None
<u>Elaboration</u>	<u>Implementation</u>					
This activity fully lies within the elaboration process of this action	None					
A2	<p><b><u>Development of the technological roadmaps and investment priorities</u></b></p> <p>This activity was undertake through the involvement of the Technological Districts, including for the NMP sector the regional Technology District for Advanced Materials</p>					

(TD Materials) led by ASEV and the NMP-REG SG.

Some of the main activities carried out are summarised here:

- **Process set-up with the Managing Authority:** Technical meetings with the S3 Coordination Units and the Observatory S3 in order to make a fine tuning of the methodology to be adopted, particularly concerning the participation process and the key points to describe in the proposal document for NMP sector.
- **Management of the participation process:** A learning and participation activity open to entrepreneurs and researchers was launched for NMP sector and structured in a series of presentations and focus groups meetings. More than 500 people participated in the various initiatives. Part of the content of these meetings covered the NMP-REG project activities and practices, some of which were then used as inspiration for the roadmaps (see below).**Data analysis and identification of the strategic roadmaps:** All results gathered during the focus groups were composed in a first draft of recommendation document, containing also a preliminary list of technological roadmaps (strategic priorities for investments) to be proposed to the Managing Authority for their inclusion in the new RIS3. This document was shared with the steering group, with all the people who attended the focus groups and with all public-private entities partners of the TD Materials. Their contributions were gathered into a second version;
- **NMP-REG Mid-Term Event:** on 24th January (as part of the Interregional Learning process), NMP-REG project held its mid-term event in Leuven (Belgium) just dedicated on "Consolidating Nanotechnologies and Advanced Materials in updated Smart Specialisation Strategies". The event saw participation from representatives of several EU regions and by the representatives both of the ROP ERDF 2014-2020 managing authority and S3 Observatory. It represented the first opportunity for interregional exchange on the new technological roadmaps and RIS3 strategy of Tuscany in NMP sector
- **Official presentation of strategic roadmaps to the Managing Authority:** a public workshop was held in Empoli in order to officially present to the MA and S3 Observatory the work done and the new roadmaps proposed for the reviewing of the RIS3 2014-2020 from the NMP sector. The document was formally approved in spring 2018, after a dedicated public workshop held in Florence (<https://bit.ly/2Ta75BV>) with web video streaming. The short presentation done by NMP sector is available at (<https://bit.ly/2qrLBQu>).

<u>Elaboration</u>	<u>Implementation</u>
<ul style="list-style-type: none"> <li>• Process Set up stage</li> <li>• Organization and management of the NMP-REG regional stakeholders group meetings</li> </ul>	<ul style="list-style-type: none"> <li>• Organization and management of additional meetings and focus group with a wider (than NMP-REG stakeholders group) number of</li> </ul>

	<ul style="list-style-type: none"> <li>• Whole introduction to the NMP-REG project and RIS3 concept and meaning</li> <li>• Presentation and discussion about NMP-REG practices and lesson learnt from Interregional Learning Events</li> <li>• Development (with NMP-REG SG) of the participation process and methodology for involving a large number of entrepreneurs and researchers</li> <li>• Development of a preliminary set of technology roadmaps to be evaluated by entrepreneurs and researchers</li> <li>• Development of methodology and tools (e.g. questionnaires, preliminary lists, recommendation documents)</li> <li>• Organisation of the NMP-REG project mid-term event in Leuven</li> </ul>	<p>entrepreneurs, researchers and other representatives from territorial institutions</p> <ul style="list-style-type: none"> <li>• Large-scale distribution of questionnaires and online support</li> <li>• Data analysis and processing</li> <li>• Fine tuning and submission to the MA. NMP-REG stakeholders group indeed (including LP) acted in this activity on behalf of the managing authority.</li> <li>• International benchmarking. LP (sometimes with specific representatives of the NMP-REG stakeholders group) supported the S3 Observatory and the managing authority in this activity concerning NMP sector.</li> </ul>				
<p><b>A3</b></p>	<p><b><u>Analysis of the interregional positioning of the Roadmaps (benchmarking and assessment)</u></b></p> <p>The technological roadmaps resulting from the previous activities (NOTE: not only the ones described in relation to the NMP sector) have been subjected to 3 different parallel analyses and evaluation procedures:</p> <ul style="list-style-type: none"> <li>- benchmarking analysis with the sectoral specializations indicated in the Horizon 2020 Program and relative positioning of strategic assets;</li> <li>- ability to attract investments on the territory;</li> <li>- benchmarking analysis with the thematic EU S3 platforms and / or interregional cooperation programmes;</li> </ul> <p>In this activity (see also a5) ASEV + NMP-REG SG participated to several technical meeting with MA and external evaluators such as IRPET (for the territorial positioning of the strategic roadmaps), Frost&amp;Sullivan (for their capability to attract investments), ISMERI Europa (policy and economic assessment), University of Trento (cross-sectoriality assessment, H2020);</p> <table border="1" data-bbox="268 1870 1422 2047"> <thead> <tr> <th data-bbox="268 1870 815 1933"><b><u>Elaboration</u></b></th> <th data-bbox="815 1870 1422 1933"><b><u>Implementation</u></b></th> </tr> </thead> <tbody> <tr> <td data-bbox="268 1933 815 2047">None</td> <td data-bbox="815 1933 1422 2047">This activity fully lies within the implementation process of this action.</td> </tr> </tbody> </table>		<b><u>Elaboration</u></b>	<b><u>Implementation</u></b>	None	This activity fully lies within the implementation process of this action.
<b><u>Elaboration</u></b>	<b><u>Implementation</u></b>					
None	This activity fully lies within the implementation process of this action.					

		LP (sometimes with specific representatives of the NMP-REG stakeholders group) supported the S3 Observatory and the managing authority in this activity concerning NMP sector.
A4	<b><u>Information, dissemination and exchange</u></b>	
	<p>Organization of workshops and thematic events focused on sharing knowledge and results of the previous phases and looking for additional suggestions and point of views, also through the use of web-based platforms and social media.</p> <p>In this activity ASEV + NMP-REG Stakeholders Group participated to several events in order to share the work done and report NMP-REG practices.</p>	
	<b><u>Elaboration</u></b>	<b><u>Implementation</u></b>
	Half and half.	
	<p>During these events, dissemination activities focused both on the NMP-REG project (with new examples of good practice coming from the latest interregional learning events) and on promoting the new technology roadmaps identified for RIS3.</p>	
A5	<b><u>Institutional validation</u></b>	
	<p>A5 contains all the legal and administrative activities and procedures that take place within the Regional Authority before the official approval of the RIS3. This is a mandatory, but very formal stage in which NMP-REG and LP has no direct influence.</p> <p>Validation and official publication, by a dedicate Regional Council Decree, of the new Smart Specialization Strategy document for Tuscany Region.</p> <p>Preliminary draft was published in January with the Regional Council Decree n°46 of 21<sup>st</sup> January 2019.</p> <p>The final notes for updating the new RIS3 2014-2020 were published in late February by the <b>Regional Council resolution n ° 204 of 25<sup>th</sup> February 2019</b>.</p>	
	<b><u>Elaboration</u></b>	<b><u>Implementation</u></b>
	None	Implementation activities by MA only

**RESULTS from the above process: Validated Technological Road Maps, building on the inspiration from NMP-REG**

The new roadmaps (together with related documentation and annexes) were officially delivered to the MA and the **identified technology roadmaps** concern [application sectors]:

1. *Materials for high performance nanostructured surfaces and composites* [Manufacturing, Construction, Mechanic, Food, Energy]

2. *Materials for active and smart surfaces and composites* [Diagnostics, Manufacturing, Building, Agro-Food]
3. *Materials and nanotechnologies for the delivery of active compounds and active ingredients* [Medicine, Food, Cosmetics, Agriculture]
4. *Technologies and materials for environmental remediation* [Agro-forestry, Oil&Gas, Mining, Pharma-Chemical, Manufacturing]
5. *Technologies for recovery and enhancement of materials from waste in a context of circular economy* [Agro-forestry, Food, Manufacturing, Chemicals, Building, Iron, Energy]
6. *Networks for Transfer and Technological Service, Open Innovation* [several]
7. *Materials for 3D Printing (Addictive Manufacturing)* [Medical, Mechanic, Electronic, Building]

The **full document** is available only in Italian language. However, an **Executive Summary** in English is also available, produced on request of the ERDF Managing Authority itself.

### **Changes brought to Tuscany RIS3 thanks to NMP-REG and reminded of inspiration from NMP-REG (already summarised in Section Background)**

In summary, respect to the previous strategy approved in 2013, the new Tuscany RIS3 presents a significant leap in quality, knowledge and awareness about the opportunities offered by NMP technologies for manufacturing sector. Particularly, concerning NMP-REG influence (see also “Interregional inputs” above):

Changes	Inspiration from NMP-REG
A. The new roadmaps represent not only the update, but also the evolution of the previous ones. Several changes were clearly identified during the interregional learning process, especially with regard to possible applications of the “passive” <i>high performance nanostructured surfaces and composites</i> (roadmap 1) and “active” <i>smart surfaces and composites</i> (roadmap 2)	<p><b>Projects and running B2B and R2B collaborations</b> in the field of:</p> <ul style="list-style-type: none"> <li>- nano chemistry, thin films, textile and advanced packaging, coming from practices and study visits at INL, CeNTI and CITIEVE in Braga</li> <li>- surface analysis and nanostructuring of materials, nano-micro-electronics, photonics, TOLAE, coming from practices and study visits at CENTECH, COPT, MST factory in NRW</li> </ul>
B. A new roadmap has been inserted from scratch concerning the horizontal need to have "open" network infrastructures structured on the example of the numerous cluster organisations studied during the NMP-REG experience (roadmap 6)	<p><b>Innovative models of cooperation and business</b> between research centres and SMEs, as from:</p> <ul style="list-style-type: none"> <li>- the several Cluster organization learnt in Norte, NRW and Flanders</li> <li>- the ICON projects paradigm to join</li> </ul>

	research and industry since the basic research (TRL 0-3)
<p>C. All roadmaps have been integrated with additional information (many coming from NMP-REG) of EU benchmarking and market trends analysis, concerning:</p> <ul style="list-style-type: none"> <li>• technologies to be developed,</li> <li>• production areas of application with examples,</li> <li>• international positioning (respect other EU regions too),</li> <li>• key players and EU competitors (research, industry) ,</li> <li>• main running EU research and innovation projects (H2020).</li> </ul>	<p><b>The whole NMP-REG Interregional Learning process described above</b>, including smaller documents and information exchange with partners and their EU stakeholders</p>

### Action concept and Specific Activities (to be fully done in Phase 2)

<p><b>A6</b></p>	<p><b><u>Launch of new calls based on the updated RIS3 and support for SMEs</u></b></p> <p>With the official publication on the Official Bulletin of the Region of Tuscany (BURT), the new RIS3 has automatically become the regional reference strategy <u>for each</u> new ERDF ROP 2014-2020 call.</p> <p>During all Phase 2, therefore, LP and the NMP-REG SG will have the opportunity to take advantage of every remaining call to facilitate the creation of B2B/R2B agreements and projects focused on topics consistent with the NMP sector.</p> <p>This is already happening, for example, by exploiting some “small” calls for proposals to support innovation through the <b>acquisition of research services and qualified skills</b> which the MA will maintain open also during Phase 2 and which, very simply, as of 1 March 2019 have automatically redirected to the new RIS3: the concept of these calls is to encourage the acquisition of skills by SMEs through the submission of small applications (e.g projects of minimum 15K€ - maximum 50K€ financed at most 50%) for product or process innovation in the production chain. At this purpose the LP, together with the NMP-REG SG, will organize regular information meetings on funding opportunities, orientation to the new RIS3 strategy, contact with research centers and support to SMEs in the manufacturing sector for the development of applications in the NMP sector.</p> <p>Finally a new call for research and innovation projects is <u>expected</u> for 2020, <u>but not officially scheduled</u> yet: this new call, indeed, would be based on remaining ERDF</p>
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	<p>falling from different measures because unallocated or unspent and requires a policy decision.</p> <p>For the sake of the clarity, many calls for tender already in the period 2017-2018 were influenced by the revision process of RIS3. This was particularly the case for a major call for strategic regional research projects launched in 2017 (RS Call 2017) <b>at the very time</b> when the technical meetings and focus groups launched in parallel with NMP-REG were in full swing. Many approved proposals, in fact, already were compliant with the new RIS3 roadmaps just after their approval in January 2018 by the Tuscany Region.</p> <p>Monitoring activities (see A7 and more below) will take into consideration all these calls for a whole assessment of the effectiveness of the work done with the new RIS3.</p>	
	<p><b><u>Elaboration</u></b></p>	<p><b><u>Implementation</u></b></p>
	<p>None</p>	<p>Only implementation activities</p>
<p><b>A7</b></p>	<p><b><u>Monitoring of results</u></b></p> <p>A7 includes all the activities of monitoring and impact assessment of the new RIS3 on the measures / axes of the ERDF ROP 2014-2020 (see indicators too).</p> <p>Due to the close link between RIS3 (technical annex) and the ROP ERDF 2014-2020, <b>MA officially adopts the same tools and indicators</b> for the monitoring action.</p> <p>In this activity ASEV and NMP-REG Stakeholders Group will support the Managing Authority and the S3 Observatory for the impact assessment of the NMP roadmaps.</p> <p>At this purpose, <b>periodic checks and technical meetings</b> will be carried out between the LP and the S3 Observatory (indicatively every six months) in order to:</p> <ul style="list-style-type: none"> <li>- evaluate the results of the calls launched during the period (RIS3 topics/roadmap, number of projects, number of companies/SMEs/research bodies participating)</li> <li>- verify the consistency of project issues with the updated RIS3 roadmaps</li> <li>- examine funding opportunities for the next period (six months later)</li> </ul> <p>Since there is currently no specific procedure for monitoring the project themes financed (only the priority strategic axis of reference among the three provided for by RIS3 is reported), the LP will use the network of contacts created with the Technological District for Advanced Materials to carry out a survey on the actual themes of development of the applications presented under the closest priority axis of "Chemistry and nanotechnology".</p> <p>All new data collected will then be linked to the official indicators of the ROP ERDF 2014-2020.</p>	
	<p><b><u>Elaboration</u></b></p>	<p><b><u>Implementation</u></b></p>

	None	Only implementation activities
<b>Stakeholders involved</b>		
<b>Name of Organisation</b>	<b>Role in Action Plan Implementation</b>	
<b>Tuscany Region – ERDF ROP 2014-2020 Managing Authority</b>	<p>The regional ROP ERDF Managing Authority sector represents the main NMP-REG stakeholder, which formally support the project since its submission.</p> <p>The entire action falls within its own roles and responsibilities.</p>	
<b>Tuscany Region - S3 Coordination Unit</b>	<p>The S3 Coordination Unit represents all the Regional Departments. S3 Coordination Unit acts under the umbrella of the Managing Authority.</p> <p>It is directly involved in order to identify opportunities, synergies, integrations and links between the RIS3 objectives and regional policies.</p>	
<b>Tuscany Region - Observatory S3</b>	<p>Observatory S3 is the main responsible body for the RIS3 development, including mid-term review and updating process and the monitoring of the RIS3 effectiveness.</p> <p>RIS3 2014-2020 represents the main technical annex of the ERDF ROP 2014-2020, because identifies the strategic and technological domains on which Tuscany addresses ERDF funds. RIS3 particularly affects measures and axes for research, innovation and SME's competitiveness (OT1-OT3)</p> <p>As such, Observatory RIS3 acts under the “umbrella” of the ROP ERDF Managing Authority.</p>	
<b>Regional Technological Districts (including TD materials)</b>	<p>Technological Districts represent the key actors for the development of the technological roadmaps. Each TD focused on a specific regional production sector (e.g. TD Textile, TD Lifesciences) or key enabling technology (e.g. TD Materials for NMP). Tuscany Region identified 10 Technological Districts.</p>	
<b>IRPET</b>	<p>IRPET is the Regional Institute for Tuscany Economic Planning. IRPET supports MA for analyses and statistics.</p>	
<b>Industries, SMEs, research organizations, entrepreneurship associations</b>	<p>They participate to the RIS3 review process, in order to identify the technological roadmaps</p>	



<u>Risk and Contingency Plans</u>		
Description of Risk	Level of probability (High, Medium, Low)	Description of Contingency Plan
<i>Low number of calls in the remaining period of the ROP 2014-2020 for testing the effectiveness of the new strategy</i>	Medium	<ul style="list-style-type: none"> <li>• Even if not yet published, the last Call 2017 for strategic R&amp;I projects (with a relevant budget) was highly influenced by the participation process for the new RIS3 and several topics - then become roadmaps - were developed in project proposals</li> <li>• RIS3 doesn't not concern only calls, but the whole regional strategy and decisions taken on ERDF</li> </ul>
<i>Lack of specific indicators for the NMP sectors</i>	Low	<ul style="list-style-type: none"> <li>• The new RIS3 maintained the previous structure based on 3 main technological pillars. One of the pillars concerns "Chemical and NMPs". ROP ERDF 2014-2020, based on RIS3, foresees indicators split for each pillar</li> <li>• TD Materials will also monitor projects and other initiatives launched by own industries/SMEs/research organizations</li> </ul>

<u>Timeframe</u>		
Phase	Activity Number	Time period
PHASE 1	A1	January 2017 – March 2017
	A2	April 2017 – March 2018
	A3	January 2018 – September 2018
	A4	May 2018 – February 2019
	A5	Late February 2019 (milestone)
PHASE 2	A6	April 2019 – March 2021

	A7	April 2019 – March 2021
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### Costs and funding sources

#### Costs for the RIS3 review and update process

The whole **cost for the RIS3 reviewing** and updating process is estimated over **200 K€** (including the in-kind activity of the internal staff of the management authority) of which around 120K€ addressed to the wide participation process through the Technological Districts. Needed funds come from ROP ERDF 2014-2020.

Concerning NMP sector, the regional authority allocated around 15K€ to be used for the implementation activities described over (mainly in relation to the group of activities A2+A3). To this must be added the contribution in kind (use of internal staff) by the various stakeholders and by ASEV itself for the performance of several activities complementary to the action.

#### ROP ERDF affected by the improvement

Moreover, the new RIS3 will also affect the use of the remaining ERDF concerning research, development and innovation (Axis 1 of the ROP ERDF). The remaining funds for this purpose currently amount to around **€30 million**<sup>4</sup> split into several measures.

Nevertheless, there are the residual funds (unallocated or unspent) also coming from other Axes that should be reallocated under Axis 1. A policy decision at this purpose is expected within late 2019: the same happened at the end of previous programming periods (2000-2006 and 2007-2013). This amount is still to be assessed (indicatively around €20-40 million) but would significantly increase the previous value.

Moreover, as already mentioned above, although the new RIS3 was not yet officially operational, the last call 2017 for regional strategic research and development projects (about **€70 million**) strongly influenced the process of revision of RIS3 and vice versa, as the two processes of participation took place at the very same time.

### Monitoring

<b>Monitoring tools (description of the tools and how they will be applied)</b>	<p>For the monitoring of ACTION 1 will be adopted the same tools provided by the guidelines of "<i>Feeding, updating and monitoring of physical and procedural progress data</i>" functional to the enhancement of the indicators of output and implementation provided by the Tuscany ROP ERDF 2014-2020.</p> <p>In line with the Community guidelines, ROP ERDF:</p>
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<sup>4</sup> For a better estimate we are waiting for the data on the funds allocated as at 31 December 2018

	<ul style="list-style-type: none"> <li>- provides for each investment priority a set of indicators to measure the outputs of the operations financed</li> <li>- identifies for each indicator a target to be reached by 2023 (for each axis, intermediate targets are planned for end 2018 too)</li> </ul> <p>NMP-REG will focus on these indicators, splitting the results according to the 3 RIS3 priority pillars and considering only those related to the priority "Chemistry and Nanotechnology", where NMPs mainly lie.</p> <p>Data will be provided by the managing authority and S3 Observatory sector.</p>
<p><b>Indicators / target amounts and Means of Verification (add as many lines as necessary)</b></p>	<ul style="list-style-type: none"> <li>- <u>The acceptance and the inclusion of the new technology roadmaps for NMP sector in the new RIS3 2014-2020</u> represents itself a relevant result indicator [publication of the new reviewed RIS3 2014-2020]</li> <li>- <b><u>Number of enterprises investing in NMPs</u></b> [Project self-defined performance indicator]</li> <li>- <u>Number of enterprises cooperating with research institutes</u> [ROP 2014-2020 result indicator. The value limited to projects related to NMP issues will be considered as a percentage of the total value]</li> <li>- <u>Number of new projects addressed to the new NMP roadmaps</u> [This value can be derived from the 2014-2020 ROP indicators: NMPs are one of the three pillars of RIS3 and the consistency of a project with RIS3 is a required figure for each funded project.]</li> </ul>

## ACTION 2

ACTION 2 - Improve innovation delivery of NMPs by supporting cross-cluster multidisciplinary initiatives and strengthening cluster policies

### OVERVIEW of the proposed policy improvement

**Multi-disciplinarity and cross-sectoriality** represent key factors of success for a proper innovation delivery operation, particularly for NMP sector.

Moreover, an updated base of **knowledge** and skills **represent the leverage for a proper management of a policy instrument all along all its cycle of life** (ex-ante analysis, development, measures implementation, monitoring, ex-post evaluation, etc.). This is particularly true for “research and innovation” policies, which need to be addressed to the right priorities in order to optimise the available resources (e.g. compliance with the real potential and vocation of the local production systems, cost/benefit balance, etc.), deal with **multidisciplinary topics** and where the **changes induced by innovation** can cause wide revolutions in a very short time period.

At this purpose, ROP ERDF 2014-2020 clearly identifies the **key role of clusters** (in Tuscany named “regional **Technological Districts**”, including the one on **Advanced Materials**) as a major player in innovation and technology transfer policies → **BUT without being able to effectively integrate them in decision-making mechanisms**. This is **due** not only to a lack of resources (those provided are anyway few with around 5M€ for 10 running Technology Districts), but mainly because:

- ❖ The **Regional Authority deals with Technological Districts (TD)** more as “research projects” - with activities to be carried out, documents to be delivered, results to be obtained - **than as selected bodies supporting regional strategies** and providing knowledge
- ❖ There is no a policy or operative interface with the regional authority or **coordination table** to manage them, monitoring their activities, capitalizing results: there is a **weak connection between TDs and the decision-making processes** of the regional authority
- ❖ No specific measures were envisaged for **supporting strategic projects and cross-cluster initiatives**.

In this context, **the proposed Action aims to meet these needs paving the way** for:

- **Launching of cross-cluster and multidiscipline collaboration initiatives:** launch of joint multidisciplinary events, creation of strategic cross-sectorial regional investment projects (e.g. in the nautical sector, life sciences, fashion, etc.)
- **Boosting the use of TDs’ expertise in regional decision-making mechanisms:** TDs should be used as a **pool of expertise** in regional decision making, including the ROP ERDF life cycle

and complementary activities when regional officers and their activity should be supported by more focused technical skills. Greater coordination between TDs and with the Managing Authority through the creation of a coordination table can lead to input in various policy processes, including replication of the RIS3 development model with the launch of wide participation/consultation process technically managed by TDs and technical consultancy to predict technological trends and handle changes induced by innovation in the regional production system.

- **Strengthening the role of Tuscany in the European S3 Platform**, fostering interregional cooperation and supporting a more active participation of regional representative to the joint work collaboration initiatives by including also external expertise: formal involvement of the TDs in the EU S3 Platform activities on behalf or together with the Regional Authority

**The Action will be implemented by pivoting on the Technological District for Advanced Materials (NMP), coordinated by LP and the NMP-REG Stakeholders Group (bottom – up approach).**

**Chance to see this implemented:**

High, for a number of reasons:

- Representatives for the regional government (managing authority) have been involved in the process of Action Plan development;
- A wide stakeholder group has been involved in the process, including other regional Technology Districts;
- Much of the background work can be carried out by the Technology Districts (using their own ERDF budgets), presenting the Regional Government with a clear proposal.

However, funding for strategic projects, as a result of cooperation work, will depend on the availability of resources remaining over the period (or could possibly exploit non-ROP resources). Moreover, the 2020 regional elections will affect a period of AP implementation, with periods of low decision-making (especially in the 3 months before and after the elections). ASEV, however, will ensure continuity of action by TD Materials and its stakeholders.

**Needs addressed**

Tuscany is a region with a high level of scientific excellences and consolidated manufacturing and craft skills, but densely fragmented in SMEs with fewer than 15 employees. In spite of policy instruments and measures that seem to adequately cover research and innovation needs, there is a **persistent cultural lack** in entrepreneurs **still strongly anchored to a sectoral development**

**models** that offers few possibilities for a real collaboration with other stakeholders and sharing of business information, **particularly in traditional sectors** as for **manufacturing**.

**As well, policy instruments for research and innovation regarding NMP need to be addressed to the right objectives** in order to optimize the available resources and be compliant with the real potential and vocation of the local production systems to absorb and integrate new technologies interlinked with NMPs. This is particularly relevant nowadays where the **changes induced by innovation can cause wide revolutions** in production systems **with a life cycle much shorter than the 7 years** used for the Regional Operative Programme: this is what, for example, happened in the production systems with the revolution caused by the **4.0 technologies**.

In this context, regional strategies and **policy makers need to be supported by a shared and periodically updated knowledge** about the:

- **current industrial vocation**, production capacity and research skills present in the area,
- **innovative solutions** and new technologies which, if properly integrated in the productive processes, could boost the competitiveness of a production chain and/or solve regional needs,
- investment **priorities**,
- **benchmarking** elements with other national and European regions.

**Several actors should be involved in this updating, reviewing and matching process** between the available scientific and technological knowledge and its concrete possibility of favouring the development of the territory: this represents the basis on which building the new political development strategies, calls for funding, project evaluation criteria, management actions and monitoring of implementation measures.

In order to **re-launch the key role of the industry** and the entrepreneurship, as well as **supporting the Regional Authority** with competences and skills, **clusters and cluster policies represent the leverage** through which:

- **Improve knowledge and awareness** on new technologies and solutions, often suitable also for boosting the competitiveness of the traditional production sectors as manufacturing,
- **Support multidisciplinary for NMP applications** and a **cross-sectorial cooperation** between players in regional innovation chain to overcome the high level of fragmentation of the regional industrial system (high percentage of micro enterprises) that slows the access to innovation,
- **Widen**, in quantity and quality terms, the opportunities and **RTD collaboration** between companies and academia (B2B and R2B agreements).
- **Increase the quality of the workforce in companies, specifically SMEs**, with the inclusion of young researchers, taking particularly into account the key enabling technologies such as NMPs.
- **Providing** a sort of “**capacity building**” **service to the managing authority**

At the beginning of the 2014-2020 programming period, the regional political strategy focused on the creation of **regional Technological Districts (TD)**, immaterial infrastructures/network

organization created for providing **knowledge intensive business services** to SMEs and innovation within the traditional sectors of the regional economy (e.g. Textile) or key enabling technologies, such as the **TD for Advanced Materials in which is deep-rooted the Tuscan NMP-REG Stakeholders Group** .

After two years of activity, Technological Districts achieved encouraging results, but:

- i. a **very low level of resources** and policy effort has been invested in cluster policies
- ii. **the weight and the role of TDs** in regional development policies **is still weak**, because there is no a coordination table in charge to:
  - a. links and represents all Technological Districts together as a whole,
  - b. acts as interface with the managing authority and the policy makers,
  - c. make the most of the pool of expertise enclosed in TDs and put them in synergy for the development of strategic projects, innovation policies, or (more simply) get technical support in the exchange processes with the other EU regions (e.g. S3 Platform)
- iii. **no cross-cluster measures** have been planned or cross-cluster projects/ initiatives are been launched.

## Background

### Policy context and regional inputs

**Key inputs** for the action implementation resulting from the NMP-REG regional meetings and stakeholders group:

- **ROP ERDF 2014-2020** clearly identifies the **key role of the Technological Districts (TD)** as a major player in innovation and technology transfer policies. Ten TDs have been activated included the one on Advanced Materials. Each TD has a management organization resulting from public procedures managed by the same regional authority. It includes:
  - A steering committee, composed by representatives of entrepreneurship and public research, selected by the Region of Tuscany through a dedicated participatory process.
  - A managing entity, selected by an open call for tenders
- Within the framework of RIS3 Tuscany, the managing authority has established a permanent **S3 Observatory**, a working group composed of various representatives of the Directorates of the Tuscany Region and representatives of the regional technology transfer and innovation system (represented by the Technological Districts ) for any criticality or opportunity for improvement in the implementation of RIS3 (see also Action 1).

	<ul style="list-style-type: none"> <li>• <b>Multidisciplinary</b> collaboration at technical-scientific level and <b>cross-sector/supply chain cooperation</b> at production level are key factors for innovation and technology transfer policies. This is particularly true for <b>NMP applications</b>, able to offer horizontal technical solutions that <b>cannot be confined to single production sectors</b>.</li> <li>• For a proper <i>“innovation delivery of NMP to manufacturing”</i>, coordination and integration between the programmes of activities of the different TDs is an important requirement, as well as a <b>synergy cooperation with the managing authority</b>.</li> <li>• The set-up of a <b>“coordination table”</b> acting as interface between Districts and the Regional Authority <b>is recommended</b>. A joint cooperation would support:             <ul style="list-style-type: none"> <li>- the <u>policy maker</u> in identifying investment priorities for innovation and keeping in touch with entrepreneurial, technological and innovation trends;</li> <li>- the <u>technological districts</u> in carrying out their activities in a synergic way (greater effectiveness of the initiatives, better cost/benefit balance) and multidisciplinary way (complete and exhaustive innovation solutions).</li> </ul> </li> <li>• For its cross-sectorial features, the <b>Technological District for Advanced Materials should play a pivoting role in the aggregation of the other regional Districts</b>.</li> </ul>
<p><b>Interregional input (including details of activities, good practices and knowledge shared)</b></p>	<p><b>NMP-REG partners offered a wide and diversified range of practices</b> for development of <b>NMP clusters</b> (namely, different experiences of clustering around specific vertical areas of NMP application) and <b>cluster policies</b> (wider policy instruments), which were shared and deepened with the regional stakeholders.</p> <p>Tuscany interest particularly focused on the experiences developed in <b>Flanders</b> and <b>North Rhino Westphalia</b> regions where we deepened several “realisation” (clusters) and “policies” (strategic instruments, different perception and use of the local ROP) able to match with several needs. In particular:</p> <ul style="list-style-type: none"> <li>- From practices such as <b>COPT, CENTECH and MSTfactory</b> , coming from NRW experience, or <b>PRODUTECH</b>, coming from Norte, we had the opportunity to explore different ways of creation (history, needs, support tools), management (activities, relations with the research-business system, organization) and relevant cross-relationships among different thematic clusters for NMP sector (multidisciplinary);</li> </ul>



- From practices such as **ICON projects** and the “**Industry driven research programming in Strategic Research Centres**” from Flanders, we learned about:
  - a different approach to innovation delivery based on funding a selected number of main strategic centres
  - new instruments for cross-cluster cooperation such as the Innovative Business Networks (IBN) and, mainly, the Spearhead Clusters (SC) which develop and implement ambitious long-term strategy and competitiveness projects (compliant with the regional strategy) by collaboration actions among companies, knowledge centres and the same government (triple helix)
  - a new paradigm – even if difficult to be applied in Tuscany -for science-industry cooperation, going to fund combination of cooperative and strategic “basic” research in one project (ICON project).

Particularly important were the **Bilateral Exchanges** (carried out with Flanders and NRW on the occasion of various ILEs, but also through the exchange of documents and questions-answers) which allowed the deepening of critical aspects about cluster policies (NRW) and the support to cross-cluster projects (Flanders).

### Action concept and Specific Activities

Only a few Action 2 implementation activities started in the last year of Phase 1, as opposed to Action 1.

These can be summarised as follows and lay the foundation for the activities to be carried out in Phase 2:

- a. Analysis and comparison of the operating cluster policies at regional (Technology Districts) and national level (Italy): adopted instruments, result and performance indicators, cross-sector and multidisciplinary relations with the NMP sector.
- b. Verification of the whole results achieved after two years of activity of the Regional Technological Districts (the 2nd year of activity closed in March 2019. Results will be available by June 2019)
- c. Preliminary analysis of the tools and external competences adopted so far to allow the updating of the measures of the ROP, with highlighting of strengths and weaknesses (SWOT analysis). Checking of the current time needed to adapt the measures to the changes brought about by innovation.

Activity Number	Activity Description
B1	<p><b>Launch of cross-cluster activities</b></p> <p><i>Objective: improve innovation delivery effectiveness, support multidisciplinary and cross-sectoriality</i></p> <p>Identification and launch of several <b>heterogeneous, multidisciplinary and cross-sectoral</b> joint initiatives, such as:</p> <ol style="list-style-type: none"> <li><b>1. Joint organization of information and technology dissemination events</b>, such as workshops and seminars, in order to promote innovative technological solutions and specific applications for vertical manufacturing sectors. In this context, NMP sector represent horizontal technologies and multidisciplinary solutions, so LP, through the TD for Advanced Materials plays a key role for cohesion and collaboration between TD.</li> <li><b>2. Joint organization of technological “matchmaking” events</b>, also cross-thematic. At this purpose, cross-thematic events will be based on “horizontal” paradigms as, for example, <u>Industrial Modernization</u> (NOTE: the development of the Industry 4.0 strategy is currently an important guideline for regional policies and includes NMP applications too), <u>Key Enabling Technologies</u> (including NMPs) or <u>Societal Challenges</u>. Matchmaking events aim to facilitate the definition of Business to Business or Research to Business (B2B / R2B) agreements.</li> </ol> <p>As described above, <b>LP and its NMP-REG regional SG</b> - here represented by the steering committee members of the Technological District for Advanced Materials - <b>will play a pivoting role in the aggregation of the other regional Districts</b> taking on own shoulders the responsibility for carrying out the activities under the supervision of the MA. At this purpose we plan to organise 1 dissemination event and 1 matchmaking event for each year of phase two (2 events per year). The first 2 events will be followed by an ongoing evaluation of the results achieved (approximately in March 2020) with any adjustments for the following year.</p> <ol style="list-style-type: none"> <li><b>3. Identification and launch of strategic regional development projects, promoting cross-sector collaboration.</b> These projects will build on the work done above to promote interaction and on Activity B2, below. TDs can support the preparation on project proposals in this sense. Funding for such projects have three options: <ul style="list-style-type: none"> <li>○ ROP ERDF funding through a final call for innovation projects before the end of this programming period. Currently, Axis 1 does not have any more resources. However, it is expected that funds from previous calls (not-allocated or underspend) will be</li> </ul> </li> </ol>

	<p>reallocated and that one more call for projects will be launched. A policy decision on this is expected before the end 2019.</p> <ul style="list-style-type: none"> <li>○ Alternative funding sources, such as H2020 calls for Research and Innovation and for SME support and private funding initiatives.</li> <li>○ Post 2020 funding sources in a long-term, strategic context.</li> </ul>
<p><b>B2</b></p>	<p><b>Supporting multidisciplinary and cross-cluster activities (also) by involving TDs in the process of cooperation with other EU regions through Smart Specialisation Platforms (S3 Platforms)</b></p> <p><i>Objective: improve innovation delivery policies, support multidisciplinary and cross-sectoriality, enhance the relevance of NMP sector</i></p> <p>The S3 Platform provides advice to EU countries and regions for the design and implementation of their Smart Specialisation Strategy (S3) and, as such, represent:</p> <ul style="list-style-type: none"> <li>• a reference framework of increasing importance in cohesion and cooperation policies between EU countries/regions,</li> <li>• a relevant link between the regional/national policies and the various players (companies, institutions, universities and financial groups) operating on a European scale in a specific sector of technological innovation or challenge.</li> </ul> <p>The relevance of the themes dealt with by the EU S3 Platforms for the development of territorial policies, as well as the technical contents strictly related to the production sectors (for example, the <i>S3 Platform for Industrial Modernisation</i>, invited both at the NMP-REG mid-term and final phase 1 event) require constant participation in its activities. Nevertheless, the <b>Regional Authority</b> both in terms of people and technical skills, <b>does not have enough operational figures</b> to adequately cover all the tasks and opportunities offered at EU level.</p> <p>In this context, the Technological Districts - <b>particularly the ones focused on Key Enabling Technologies such as NMPs</b> - must be able to officially work side by side with the regional officers and so play a role of technical support to the Regional Authority.</p> <p>The objective is <b>supporting a qualified participation of the Regional Authority in Europe</b>, starting from the <b>EU S3 Platforms</b>, but also pursuing other interregional network opportunities. In the framework of this action plan this will be done <b>for the NMP issues, by pivoting</b> on the Technological District for Advanced Materials.</p> <p>The collaboration between the regional authority and the TD for Advanced Materials will happen <b>within the context of the S3 Observatory</b> (see also</p>

	<p>B3). LP and TD Materials already offered own availability to provide professional skills and competences on NMP sector to the various sector of the Tuscany Regional Authority involved in the S3 platforms.</p> <p>During the Phase 2 will be arranged technical meetings with the S3 Observatory at this purpose (at least 1 each semester) which will take the place of the periodical ones with the MA during the Phase 1. When proper (e.g second year of Phase 2) meetings will happen together with the ones for the activities B3 (see under).</p> <p>Activities and costs for the provision of the required skills will be firstly part of the tasks and budget of TD Materials (ROP ERDF 2014-2020).</p>
<p><b>B3</b></p>	<p><b>Setup and management of a cross-cluster coordination table within the S3 Observatory</b></p> <p><i>Objective: improve innovation delivery effectiveness, support multidisciplinary and cross-sectoriality</i></p> <p>The setup of the cross-cluster <b>coordination table will follow a bottom up approach</b>, starting from growing cross-cluster activities and proposals (see B1) <b>and again by pivoting on TD for Advanced Materials and LP</b>. It will use the <b>horizontal characteristics of the NMP applications</b>, here represented by the TD for Advanced Materials, in relation to the production sectors, as an aggregating element for the enhancement of multidisciplinary.</p> <p>This activity will see the creation of <b>working and exchange group</b> between the Managing Authority and the Technological Districts (in particular those addressed to the Key Enabling Technologies) within the umbrella of the <b>S3 Observatory</b>,</p> <p>At this purpose, during the elaboration activity the <b>S3 Observatory</b> resulted the most suitable tool, because it:</p> <ul style="list-style-type: none"> <li>- lies under the control of the managing authority and is already in touch with the LP for the RIS3 processing activity</li> <li>- includes representatives from all TDs and several regional departments,</li> <li>- acts as their “mirror group” for RIS3 purposes</li> </ul> <p>This activity will increase and upgrade the role of the S3 Observatory from mirror group to a more operational one on RIS3 issues. In this context, the tasks of the working group will aim at:</p> <ul style="list-style-type: none"> <li>• <b>Coordinating and capitalizing knowledge and skills</b> held by the regional Technology Districts.</li> <li>• Fostering synergies between <b>decision-making processes</b> (policy</li> </ul>

	<p>level) and skills/knowledge coming from TDs (technical level) Providing <b>capacity building</b> services to the managing authority</p> <ul style="list-style-type: none"> <li>• Identifying and <b>implementing processes of participation and decision support</b> through focus and exchange sessions with entrepreneurs and researchers following (also in lighter version) what has been done for the RIS3 strategy and/or by the use of web consultation tools</li> <li>• Raising and suggesting technological <b>roadmap for future strategies</b>, cross thematic solutions for regional needs (e.g. strategic cross-cluster projects) or other relevant actions/projects coming from a joint and cross-cluster initiative</li> <li>• Analysis and development of interregional / EU cooperation paths (e.g. making a better use of the participation to the EU S3 Platforms, see B3).</li> </ul> <p>The <b>activity will follow a bottom up approach</b>, starting from growing cross-cluster activities and proposals: in this context, it will start in the middle of Phase 2, after the consolidation of the B1 activities.</p> <p>LP will be in charge to organize preliminary meetings:</p> <ul style="list-style-type: none"> <li>• with MA, in order in order to understand how the coordination table could work and which representations in the departments of the Regional Authority to involve. The policies on the Technological Districts, in fact, are transversal to the organizational structure of the Region, and depending on the activities requested of it, they require the opinion of the Presidency and of the Department for Economic Development and Productive Activities as well as of the MA.</li> <li>• With the managing entities of the other regional Technological Districts (such is LP for TD Materials) in order to formally achieve their availability for the coordination table. Particularly in February 2019 has been launched a call for identifying the managing entities of the last two TDs left uncovered (Advanced Manufacturing 4.0 and Paper): they will be fully operative within Autumn 2019.</li> </ul> <p>The first formal meeting between MA and TD is expected for early 2020.</p>
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<u>Stakeholders involved</u>	
Name of Organisation	Role in Action Plan Implementation
<b>Tuscany Region – ERDF ROP 2014-2020 “Managing</b>	The regional ROP ERDF Managing Authority sector represents the main NMP-REG stakeholder, which formally support the project since its submission.

<b>Authority”</b>	The entire action falls within its own roles and responsibilities.
<b>Tuscany Region - Observatory S3</b>	<p>Observatory S3 is the main responsible body for the RIS3 development and acts as mirror working group among several departments of the Tuscany Region and representatives of the regional technology transfer and innovation system, including the Technological Districts.</p> <p>Observatory RIS3 acts under the “umbrella” of the ROP ERDF Managing Authority.</p>
<b>Tuscany Region – DG Economic Development</b>	DG responsible for research and development, including Cluster/TD policies
<b>Regional Technological Districts – Management Entities</b>	Each Technological District is coordinated by a Managing Entity selected by an open call for tenders which represents its operational arm. ASEV coordinates the TD for Advanced Materials.
<b>Regional Technological Districts – Steering Committees</b>	<p>Each Technological District has a Steering Committee, composed by representatives of entrepreneurship and public research, selected by the Region of Tuscany through a dedicated participatory process. Its president is appointed by the Presidency of the Regional Authority.</p> <p>Steering Committee is responsible for setting the strategic direction of the district.</p>
<b>IRPET - Regional Institute for Economic Planning in Tuscany</b>	IRPET is the regional institute for the study of the regional socioeconomic structure and its transformations, the economic trends and the related analytical tools. It also develop preparatory studies for the regional planning on economic, territorial and social problems

<b><u>Risk and Contingency Plans</u></b>		
<b>Description of Risk</b>	<b>Level of probability (High, Medium, Low)</b>	<b>Description of Contingency Plan</b>
Lack of resources in the remaining ROP ERDF 2014-2020 period	Medium-high	The planned improvement activities do not require specific funding, except for B4, where costs of joint events will be covered by TDs (with own ERDF funds). Funding for strategic projects, as a result of cooperation work, will

		depend on the availability of resources remaining over the period (or will exploit non-ROP resources).
Cluster policies combine roles and responsibilities of different sectors/DGs of the regional authority (not only the ROP FESR 2014-2020 Managing Authority)	Medium	<p>Within the scopes of this Action Plan, implementation activities will be developed only under the umbrella of the ROP FESR 2014-2020 Managing Authority by pivoting on the S3 Observatory (managed by the MA) and TD Materials (managed by ASEV).</p> <p>Additional activities to strengthen cluster policies in a wider framework may be carried out with other sectors/DGs.</p>
The ambition of the proposed activities (significant change from the previous way of managing the policy instrument on these measures) could lead to lower than expected policy improvements	Medium	Any partial results will, however, represent a significant improvement on the current measures of the ROP ERDF 2014-2020, with positive effects also for the post-2020 period.
Upcoming regional elections in spring 2020 could lead to different policy choices	Medium-High	The 2020 elections will probably affect a long period of AP implementation, with periods of low decision-making (especially in the 3 months before and after the elections). LP, however, will ensure continuity of action by pivoting on TD Materials and its stakeholders

<b>Timeframe</b>		
<b>Phase</b>	<b>Activity Number</b>	<b>Timing</b>
<b>PHASE 1</b>	<b>Preliminary activities</b>	<p><b>October 2018 – March 2019</b></p> <p>[The analysis was carried out in late Phase 1, following the closure of the second year of activity of the 8 Technological Districts activated between October 2016 and February 2017. The last two TDs were activated at the beginning of 2019]</p>

<b>PHASE 2</b>	<b>B1</b>	<p><b>October 2018 – March 2021</b></p> <p>[Activities started in late Phase 1 with the first joint B2B and R2B events held in November 2018. Continuous activity for the whole Phase 2]</p>
	<b>B2</b>	<p><b>January 2019 – March 2021</b></p> <p>[Continuous activity for the whole Phase 2. Concerning NMP sector, by the TD for Advanced Materials, preliminary meetings with the managing authority are started in late Phase 1. ASEV, by NMP-REG project, was already in touch with the EU S3 Platform for Industrial Modernisation and invited their representatives both at mid-term Phase 1 event (Leuven, January 2018) and final Phase 1 event (Florence, March 2019)]</p>
	<b>B3</b>	<p><b>January 2020 – March 2021</b></p> <p>The setting up of the coordination table will follow a bottom up approach, starting from growing cross-cluster activities and proposals. Nevertheless, preliminary meetings with the managing authority started at this purpose since January 2019.</p>

### Costs and funding sources

The activities mainly concern a “ *change in the management of the policy instrument (improved governance)* ” (Type 2) whose implementation is of interest to all parties involved.

As such, all costs will be covered:

- **in kind**, by the parties involved, mainly for the use of internal staff (e.g. participation in meetings)
- Particularly concerning the launch of cross-cluster initiatives, with its own financial resources allocated for the development of the workplans of the Technological Districts: resources come from the ERDF ROP 2014-2020 and consist in around **€ 5 million** for a 3-4 years working period (end in March 2020).

Funding for strategic projects (by cross-clusters calls), as a result of cooperation work, will depend on the availability of resources remaining over the period. As mentioned for Action 1 a policy decision at this purpose is expected within end 2019, but the idea is for the launching of a new call for “strategic” research and innovation projects with a whole budget of indicatively around €20-40 million.

Finally, when drafting this document, the costs for the B2 activities (*Involvement of TDs in the S3 Platforms*) will also be covered by in-kind or TD resources, as outlined above. However, it is likely that the managing authority will be able to provide additional resources during Phase 2 to cover



part of the resulting activities (studies, travel, interregional exchange activities, etc.).

<b>Monitoring</b>	
<b>Monitoring tools (description of the tools and how they will be applied)</b>	<p>ASEV, taking advantage by the competences of own Stakeholders Group too, will support and monitor the implementation of all the listed activities in tight contact with the managing authority and the network of the Technological Districts. The main monitoring tools will consist in:</p> <ul style="list-style-type: none"> <li>- the same <b>monitoring tools and guidelines of the ROP 2014-2020</b>, as from the latest Decision of the Regional Council n° 4, 4<sup>th</sup> December 2017.</li> <li>- the specific <b>indicators</b> identified in ROP 2014-2020, particularly concerning cluster and innovation delivery policies and taking into account NMP sector (see under). Data will be provided by the managing authority.</li> <li>- the <b>S3 Observatory</b> and its periodical meetings (at least one for semester)</li> </ul>
<b>Indicators / target amounts and Means of Verification (add as many lines as necessary)</b>	<ul style="list-style-type: none"> <li>- <u>Number of enterprises investing in NMPs</u> [Project self-defined performance indicator]</li> <li>- Number of enterprises cooperating with research institutes [ROP 2014-2020 result indicator]</li> <li>- Number of cross-clusters projects identified [This value is actually not a ROP 2014-2020 result indicator, but can be derived from the joint cooperation among TD's within the coordination table]</li> </ul>

**Official Signature(s)**

**ASEV – Agenzia per lo Sviluppo Empolese Valdelsa (Lead Partner)**

<b>Date:</b>	22nd July 2019
<b>Organization (italian)</b>	ASEV – Agenzia per lo Sviluppo Empolese Valdelsa
<b>Organization (english)</b>	ASEV – Agency for the Development of the Empolese Valdelsa
<b>Name</b>	TIZIANO CINI
<b>Signature</b>	Sign and stamp of the organization (if available)  <b>Agenzia per lo Sviluppo Empolese Valdelsa</b> V. delle Fiascaie, 12 50053 EMPOLI P. IVA 05181410480



## Letter of endorsement from the relevant organisation responsible for policy

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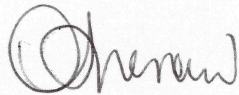
Project acronym	NMP-REG
Project title	Delivering Nanotechnologies, advanced Materials and Production to REGional manufacturing
Name of the organisation (original) including department (if relevant)	Settore Autorità di gestione del POR FESR 2014-2020 – Regione Toscana
Name of the organisation (English) including department (if relevant)	Unit Managing Authority of the ROP ERDF 2014-2020 – Tuscany Region
Name of the policy instrument addressed (original)	POR FESR 2014 – 2020 Asse I - Rafforzare la ricerca, lo sviluppo tecnologico e l'innovazione - Priorità 1b (varie misure)
Name of the policy instrument addressed (English)	ERDF ROP 2014 – 2020 Axis I Strengthen RTD and Innovation - Priority 1b (several measures)
Name of partner(s) concerned in the application form (English)	Agency for the development of the Empolese Valdelsa

We hereby confirm:

- that we expressed from the outset all support to the ASEV – Agenzia per lo Sviluppo Empolese Valdelsa – as NMP-REG coordinator,
- that the topic tackled by this project is in line with our organization's policy and Smart Specialisation Strategy (RIS3),
- that we participated to several project meetings:
  - at regional level for identifying needs and solutions, as member of the local Stakeholders Group, including also relevant representatives of the regional research and business system members of the regional Technological District for Advanced Materials,



- at interregional level for exchanging experiences, participating with internal representatives at the Interregional Learning Events in Empoli (kick-off), Bucharest, Leuven, Koln and Florence,
- that in these contexts it was possible to follow and participate in the development of the project and to be aware of the quality of the work developed.
- that the Action Plan results and brings together the contributions of all the stakeholders involved and represents a useful working tool to be implemented for the improvement of own policy instrument
- that for these reasons we endorse the Action Plan submitted by ASEV in the context of the INTERREG EUROPE project NMP-REG.

Name of signatory	ANGELITA LUCIANI
Position of signatory	Managing Authority of ERDF ROP 2014-2020 – Tuscany Region
Date	Firenze, 22/07/2019
Signature and institution stamp	

**REGIONE TOSCANA**  
**DIREZIONE GENERALE DELLA GIUNTA REGIONALE**  
**Settore Autorità di Gestione del POR FESR**  
**Via Luca Giordano, 13**  
**50132 FIRENZE**

Regional Technological District for Advanced Materials

Date:	25/06/2019
Organization (italian)	Distretto Tecnologico Regionale per i Nuovi Materiali
Organization (english)	Regional Technological District for Advanced Materials
Name	GIOVANNI BALDI
Signature	Sign and stamp of the organization (if available) 