

## **NMP-REG**

# **Requirements for Delivering NMP Innovation to Manufacturing**

## **INTRODUCTION**

The NMP-REG report on requirements for delivering Nanotechnologies, advanced Materials and Production (NMP) to regional manufacturing has the following objectives:

1. To provide an overview of the types of policy support that are required to ensure that research and innovation in the field of NMP reaches the manufacturing system;
2. To share knowledge on some of the policy support that is provided in NMP-REG partner regions;
3. To understand some challenges identified in project partner regions, in terms of effective policy support in these fields.

The report has been structured around the categories of innovation policy support identified by the Regional Innovation Monitor Plus (RIM Plus) of the European Commission<sup>1</sup>. Launched as a follow up to the 2010 Regional Innovation Monitor, this initiative is intended to share intelligence on innovation policies in European regions and to provide practical guidance on how to use this information. Moreover, since 2014, the RIM Plus has introduced a thematic focus on Advanced Manufacturing.

Given the extensive work carried out by thematic experts to define the possible categories of innovation policy support, NMP-REG partners decided to use this as a basis for their interregional exchange. Seven categories are analysed in terms of their specific relevance to the question of innovation delivery of NMP to regional manufacturing and their status in the NMP partner regions. The categories are as follows:

1. Competitive funding to foster public research
2. Science-Industry cooperation
3. Human Resources for Science, Technology and Innovation
4. Business R&D and innovation activities
5. Innovation climate and business eco-system
6. Demand-side innovation policies
7. Others

While the report follows these categories, it must be clear that the overall objective must be to analyse and encourage comprehensive systems of support for NMP innovation delivery to regional manufacturing. Therefore, these categories are considered as sub-objectives to reach the overall objective of a complete policy support framework.

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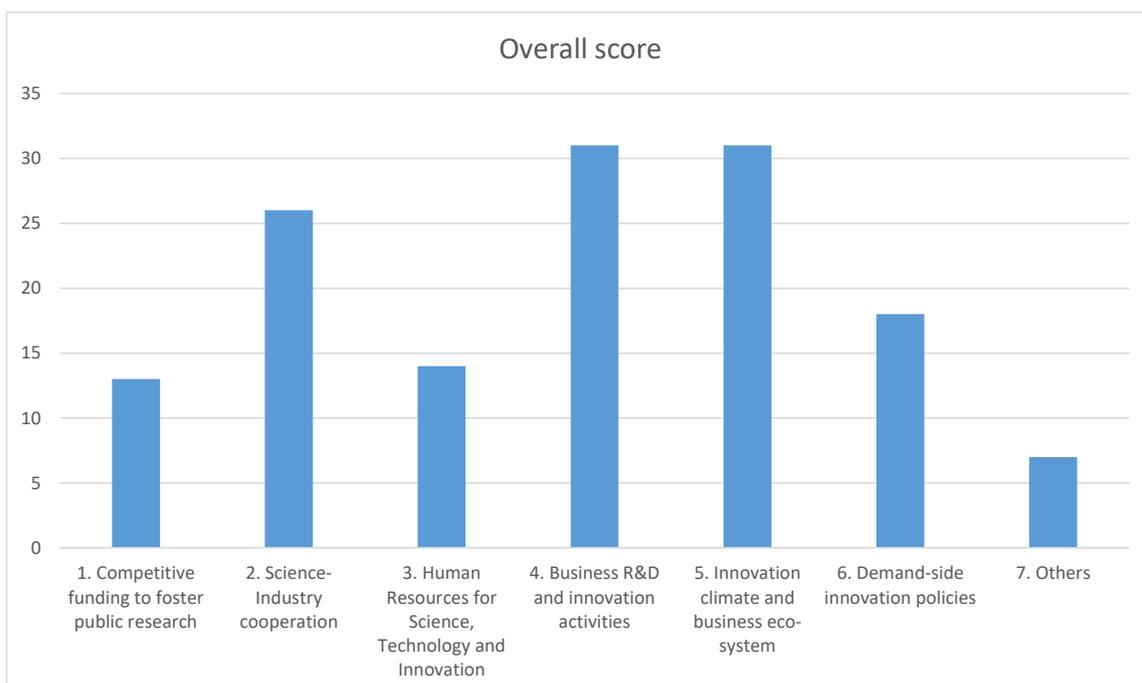
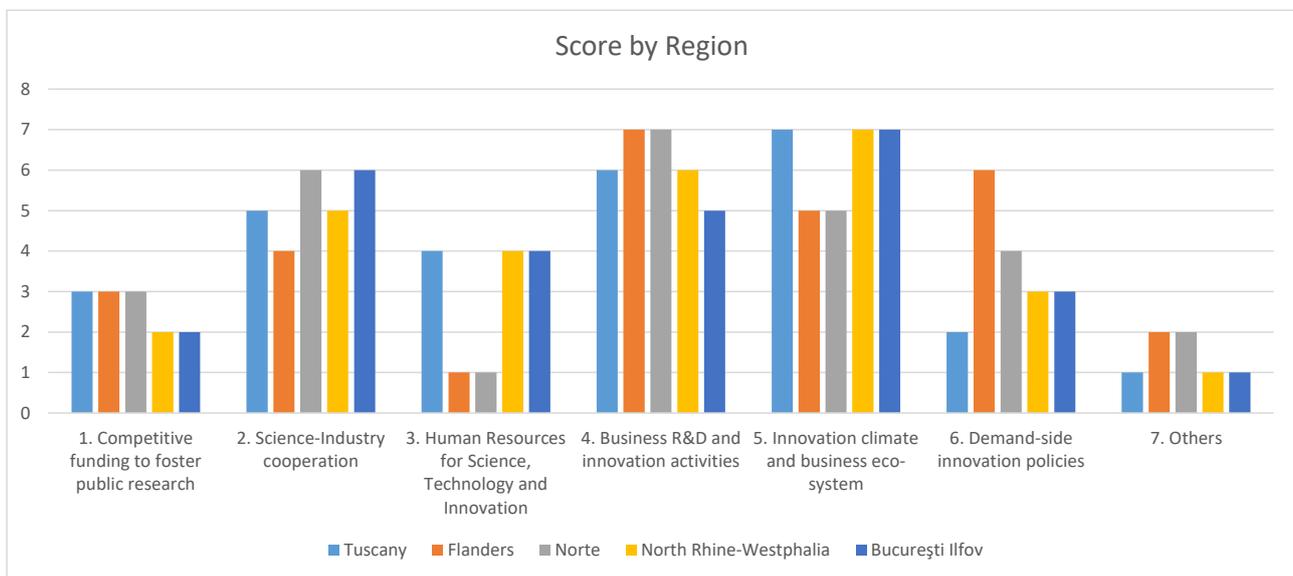
<sup>1</sup> <https://ec.europa.eu/growth/tools-databases/regional-innovation-monitor/content/regional-innovation-monitor-plus>

## EXECUTIVE SUMMARY

This chapter provides an overview of the information provided by partners in subsequent chapters. It represents a comparative analysis of partners' regional situations and should direct future activities within the NMP-REG project on the basis of these results (see also Chapter Next Steps - below).

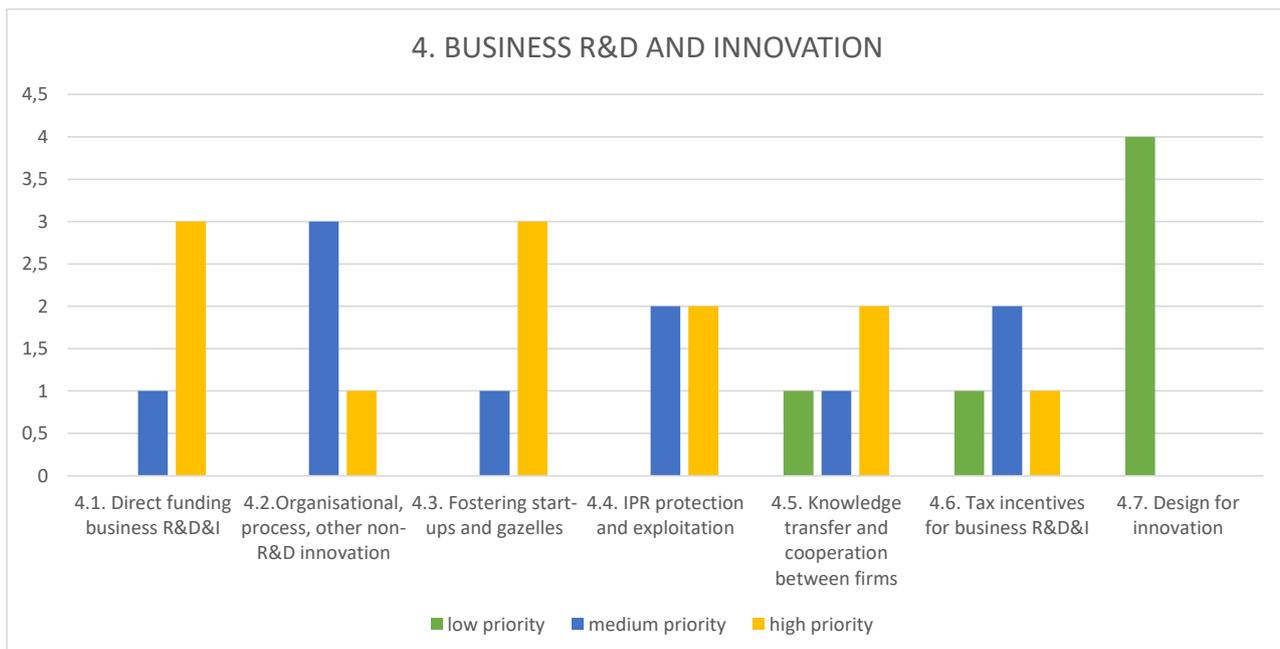
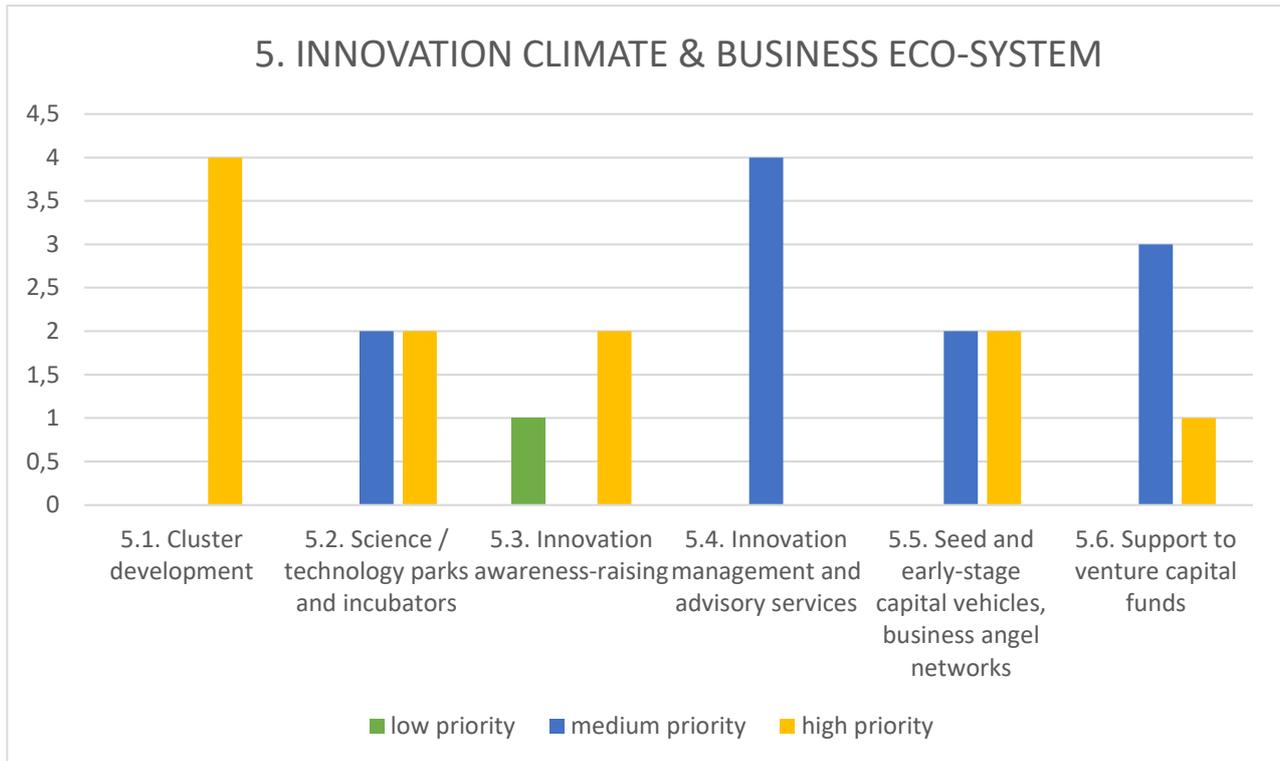
### NMP-REG regions' priorities for delivering NMP innovation to manufacturing

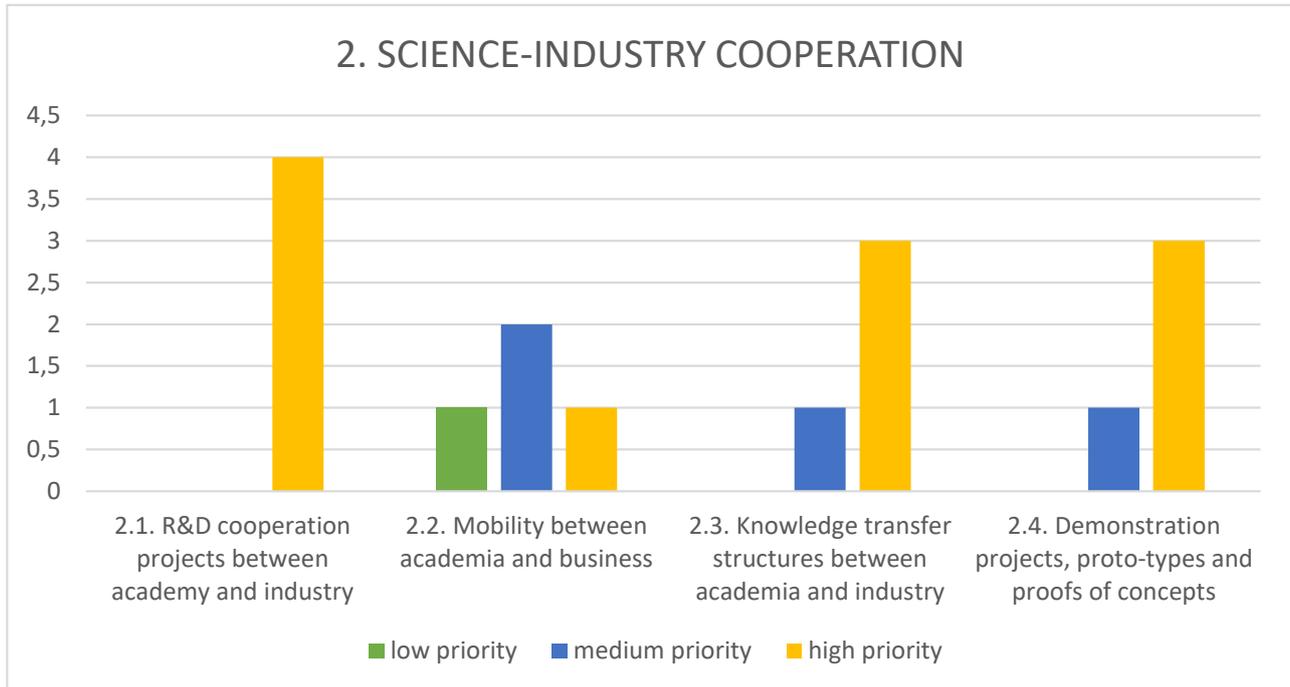
Partners were asked to indicate if each of the seven categories of innovation policy support were relevant to the NMP-REG topic of delivering NMP innovation to manufacturing. On this basis, the categories could be prioritised at project level. This prioritisation helps to focus subsequent exchange work, including the Good Practice focus (see also section Good Practice below).



From the above overview, it is clear that all regions are particularly interested in three categories: 5. Innovation climate and business eco-system; 4. Business R&D and innovation activities; 2. Science-Industry cooperation.

The following graphics provide extra information on the categorisation of the sub-categories for these three categories (low, medium or high priority).





All other categories (6, 3, 1 and 7) were evaluated as interesting by at least 3 of the participating regions. Therefore, they will be considered in future exchange, but are not identified as being of the highest priority for this specific project and/or for policy improvements in participating regions.

### **Specific issues related to the field of NMP that need to be considered**

In this section, partners were asked to mention if the various categories of innovation delivery policy had some specific issues related to NMP. In other words, they were asked to analyse whether the specific nature of NMP, in comparison to other R&I fields, would have an impact on policy for the specific category.

The division of these issues per category can be found in subsequent chapters. However, a number of the issues are not category-specific, but rather horizontal issues related to NMP technology transfer.

Therefore, they are summarised here as overall issues:

- **Need for adaptation:** companies, particularly small and/or traditional companies that are not active in R&D, need to adapt their production apparatus, processes and their overall mindset;
- **Cross-sectoral / multi-disciplinary nature of NMP:** NMP belong to the Key Enabling Technologies (KET), which enable the development of new goods and services. KET, as a rule, cannot be projected onto one specific production sector of the regional economy. Instead, they contribute to the development of products of the next or second-next generation in almost all industrial sectors. The horizontal nature of NMPs, both along the value chain (from research to market) and across different technological areas, and the many opportunities for application of technological solutions in various sectors of the regional economy, require a favourable and proactive environment to support business ideas.
- **Cooperation:** Cooperation between science (public-private research, academia) and business (industries, SMEs) is the essence of innovation delivery for a complex field like NMP and the basis for future policy improvements.

- **Skills:** NMPs are highly innovative field of applied science with a huge potential for application in production processes both in traditional sectors and innovative or science-driven sectors. Training and life-long learning of researchers and staff involved in innovation and in production processes in enterprises is essential to facilitate integration of NMP solutions into production processes. There is a latent demand in companies for additional qualification in NMP, in particular in the field of nanotechnologies. Companies often refer to a mismatch between university education and companies' specific needs in the area of nanotechnology.
- **Costs:** NMP, in particular nanotechnology, are capital intensive. While there are many opportunities for start-ups, given the endless contexts of application and business, there are also high costs for start-up (initial investments into equipment) and to scaling up to industrial scale.

## **Policy context and needs**

The questions related to territorial needs and policy needs were designed to initiate a reflection (at partner level and at comparative, project level) on the issues that partners hope to address within the NMP-REG project.

In general, partners found that their selected policy instrument covered the majority of innovation delivery categories. However, they also noted that integration with other policy instruments (see for example, the European Social Fund programmes for human resources) would be relevant and useful.

They also found a series of potential improvements that could be made to their selected policy instruments and policy context. As per section 2.2 above, these potential improvements are in many cases horizontal to different categories. They are highlighted in this format in the following table.

| Identified Improvement  | Indicated as need (YES / NO) |          |       |     |     |
|---|------------------------------|----------|-------|-----|-----|
|   | Tuscany                      | Flanders | Norte | NRW | B-I |
| Insert regional specifications into smart specialisation and funding programmes (currently designed at national level and not taking into consideration specific regional characteristics)  | NO                           | NO       | NO    | NO  | YES |
| Increase horizontal and cross-sectorial nature focus: promoting better coordination, interaction and cross-sectorial cooperation, given the potential of NMP in many application areas. This refers to laboratories, facilities and funding and to cross-cluster cooperation and coherence.   | YES                          | YES      | YES   | YES | NO  |
| Improve integration between the wide number of policy instruments / funding streams and between existing infrastructures (Direct funding, loans, guarantees, tax credit, co-funding, etc, are often managed by different institution or different departments of the same Regional Authority) | YES                          | YES      | YES   | YES | NO  |
| Reduce current level of bureaucracy in fund allocation procedures and in access to laboratories for enterprises   | YES                          | NO       | NO    | NO  | NO  |
| Improve quality of evaluation of funding proposals and their impact (ex-post evaluation)  | YES                          | NO       | NO    | NO  | NO  |

|   |            |            |            |            |           |
|---|------------|------------|------------|------------|-----------|
| Identify measures to support integration of civil society (i.e. the general public, customers or end users) and financial sector (VC funds, banks, business angels, or other investors) into cluster / cooperation models.  | <b>NO</b>  | <b>NO</b>  | <b>NO</b>  | <b>YES</b> | <b>NO</b> |
| Insert measures to promote SME / enterprise access to research infrastructures  | <b>YES</b> | <b>NO</b>  | <b>NO</b>  | <b>NO</b>  | <b>NO</b> |
| Improve support for entrepreneurial activity / business incubation, including better business models and participation of non-innovative businesses in funding programmes (widening the industrial reach to less innovative companies)  | <b>YES</b> | <b>YES</b> | <b>YES</b> | <b>YES</b> | <b>NO</b> |
| Programmes to support research that is closer to the market: more fundamental public research with a view on application in industry on short and mid-long term (higher TRL); addressing financial bottlenecks (e.g. pre-seed/ seed phase, later stage, ‘valley of death’) and attracting private seed and early-stage capital funds. | <b>YES</b> | <b>YES</b> | <b>YES</b> | <b>YES</b> | <b>NO</b> |
| Support integration with training / life-long learning, with focus on the demand from the private sectors (return on investment / enhanced knowledge on NMP application and business environment / generational exchange of knowledge)  | <b>YES</b> | <b>NO</b>  | <b>NO</b>  | <b>NO</b>  | <b>NO</b> |
| Better orientation of available resources to support territorial participation in international R&I programmes, networks and calls  | <b>YES</b> | <b>NO</b>  | <b>NO</b>  | <b>NO</b>  | <b>NO</b> |

## Good Practices

The following table provides an overview of the number of titles of Good Practices proposed for each innovation delivery category. Further information on the Good Practices considered most relevant for the NMP-REG project will be available in a separate document and during subsequent exchange activities.

| Category  | No. GPs identified | GP title / Region Proposing   |
|---|--------------------|---|
| <b>1. Competitive funding to foster public research</b> | 5                  | TUSCANY <ul style="list-style-type: none"> <li>BANDO IR (call for research infrastructures)</li> <li>MAPLAB (mapping and census of industrial research laboratories and applied and existing technology demonstrators)</li> </ul>   |
|   |                    | NORTH RHINE-WESTPHALIA <ul style="list-style-type: none"> <li>Competitive calls on research infrastructure, which led to establishment of competence centres in the field of NMP</li> </ul>   |
|   |                    | NORTE <ul style="list-style-type: none"> <li>INL – International Iberian Nanotechnology Laboratory.</li> </ul>  |
|   |                    | BUCUREȘTI ILFOV <ul style="list-style-type: none"> <li>Tax incentives to encourage investment in RDI</li> </ul>   |
| <b>2. Science-Industry cooperation</b>                  | 6                  | TUSCANY <ul style="list-style-type: none"> <li>Regional Innovation Poles</li> </ul>   |
|   |                    | FLANDERS <ul style="list-style-type: none"> <li>ICON-projects (and their preparatory road mapping exercise)</li> <li>Industry driven research agenda of the Strategic Research Centres (SRCC) (FlandersMake and iMinds experience)</li> <li>IOF Industrieel ONderzoeksfonds (Industrial Research Fund)</li> </ul> |
|   |                    | NORTH RHINE-WESTPHALIA <ul style="list-style-type: none"> <li>Demonstration/ pilot projects from the NRW region (AmpaCity and Carbon2Chem)</li> </ul>   |
|   |                    | BUCUREȘTI ILFOV   |



|  |   |   |
|--|---|---|
|  |   | <ul style="list-style-type: none"> <li>2007-2013 National RDI Plan - funding instruments for innovation (Innovation Vouchers, Stimulating high-tech export, Developing products-systems-technologies)</li> </ul>  |
| <b>3. Human Resources for Science, Technology and Innovation</b> | 3 | <p>TUSCANY</p> <ul style="list-style-type: none"> <li>Integrated Project GIOVANI SI</li> <li>IFTS (Higher Technical Education and Training) programmes</li> </ul>   |
|  |   | <p>BUCUREȘTI ILFOV</p> <ul style="list-style-type: none"> <li>Romanian Fiscal Code – Tax incentives for R&amp;D salaries</li> </ul>   |
| <b>4. Business R&amp;D and innovation activities</b>             | 7 | <p>TUSCANY</p> <ul style="list-style-type: none"> <li>Catalogue of Qualified and Advanced Services for SMEs</li> <li>Dynamic Companies (Concept, Policies And Calls)</li> </ul>   |
|  |   | <p>FLANDERS</p> <ul style="list-style-type: none"> <li>industrial R&amp;D funding programmes without requirement to involve research organisations</li> <li>evaluation bonus for starters, SMEs</li> <li>explicit IP ownership models available in funding manuals and templates</li> </ul> |
|  |   | <p>BUCUREȘTI ILFOV</p> <ul style="list-style-type: none"> <li>Public-private laboratories</li> <li>Tax incentive for workers in RDI</li> </ul>  |
| <b>5. Innovation climate and business eco-system</b>             | 5 | <p>TUSCANY</p> <ul style="list-style-type: none"> <li>Regional Innovation Poles</li> </ul>  |
|  |   | <p>FLANDERS</p> <ul style="list-style-type: none"> <li>Flanders Make clustering &amp; networking power through its activities (especially joint road mapping and projects)</li> </ul>   |
|  |   | <p>NORTE</p> <ul style="list-style-type: none"> <li>PRODUTECH – The Production Technology Cluster</li> </ul>  |
|  |   | <p>NORTH RHINE-WESTPHALIA</p> <ul style="list-style-type: none"> <li>NMP business incubation (Dortmund and Muenster)</li> </ul>   |
|  |   | <p>BUCUREȘTI ILFOV</p> <ul style="list-style-type: none"> <li>Business Angels Law</li> </ul>  |



|   |   |   |
|---|---|---|
| <b>6. Demand-side innovation policies</b> | 1 | <p><b>FLANDERS</b></p> <ul style="list-style-type: none"> <li>• Living labs on renovation of buildings, e-vehicles/mobility, social innovation</li> </ul>   |
| <b>7. Others</b>                          | 5 | <p><b>TUSCANY</b></p> <ul style="list-style-type: none"> <li>• ERANET / ERANET PLUS projects (e.g. INCOMERA on NMP, MANUNET on manufacturing, CROSSTEXTNET on textile, BIOPHOTONIC PLUS)</li> </ul> |
|   |   | <p><b>FLANDERS</b></p> <ul style="list-style-type: none"> <li>• Setting up structural collaboration between Flemish and foreign research centers</li> </ul>   |
|   |   | <p><b>NORTE</b></p> <ul style="list-style-type: none"> <li>• Construction of RIS3 Norte</li> </ul>  |
|   |   | <p><b>NORTH RHINE-WESTPHALIA</b></p> <ul style="list-style-type: none"> <li>• Dortmund-project and start2grow</li> <li>• INTERREG projects (DIAMANT and ROCKET)</li> </ul>                          |

## **NEXT STEPS**

On the basis of the input provided in subsequent chapters and summarised above, and following the approved methodology of the NMP-REG project, the next steps for exchange of experiences moves partners from an analysis of regional needs and challenges to a focus on solutions. This includes a detailed analysis of identified Good Practices and the development of Regional Action Plans.

### **From the Innovation Delivery Report to Good Practices**

The most relevant Good Practices detailed in this document will be shared among partners. The exchange should help partners to understand whether or not they are interested in transferring any given Good Practice into their own regional policy context. The means of transferring Good Practices will be detailed in the Action Plan below.

The proposal is to focus initial exchange on Good Practices related to the 3 most popular categories (5, 2 and 4). Draft descriptions of these Good Practices are expected to be shared with all partners before the end of December 2016. These will then be discussed at the third Interregional Learning Event. Following the event, partners will have a chance to update their templates and continue exchange.

Subsequently, partners will also have the opportunity to exchange on Good Practices related to the other categories.

Exchange on all selected Good Practices will be undertaken in group and bilateral sessions during Interregional Learning Events, through distance / document exchange and through staff exchanges (semester 4-5 – exact modalities to be defined).

### **From the Innovation Delivery Report to Regional Action Plans**

The Innovation Delivery Report encouraged partners to reflect on the kind of challenges that they are facing and the types of improvements that they would like to see in their existing policy instruments. The next step for each region is to start looking at how these ideas and wishes can be turned into concrete proposals for policy improvement.

The Lead Partner will propose a draft template for Regional Action Plans. This will be discussed at the third Interregional Learning Event (January 2017) in its initial format. Updated versions will be provided subsequently. Future interregional exchange and work at regional level will be focused on completing the template, with a view to preparing an initial draft before the end of Project Month 24 and a final version in Project Month 36.

The image below provides a visual overview of next steps.

