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Project acronym:	RespiceSME
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Deliverable 3.6

Report on RIS3 process in regions outlining how SMEs can positively impact the development of Smart Specialisation Strategy from the bottom up in regions with different priorities for photonics

Deliverable Name	Report on RIS3 process in regions outlining how SMEs can positively impact the development of Smart Specialisation Strategy from the bottom up in regions with different priorities for photonics
Deliverable Number	D 3.6
Work Package	WP 3
Associated Task	T 3.3
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Deliverable Lead Partner	Partner 4 - OND
Deliverable Author	Klaus Schindler, Johannes Verst with contribution from SEZ, OV, FORTH, EaPS, PhAu, SECPhO, NUI Gal, LITEK, KTN

Dissemination Level		
PU	Public	**X**
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

Contents

INTRODUCTION

In the RespiceSME project a detailed analysis of the RIS3 process in the regions of the involved clusters is performed. The aim of this analysis is to show, how far and by which means the regional policy is involved in supporting the innovation potential of the regional SMEs and in which manner the (photonics) SMEs can influence this process. A first step was the copilation of a list of best practices for regional policy support of SMEs and photonic clusters (Deliverable D3.5)

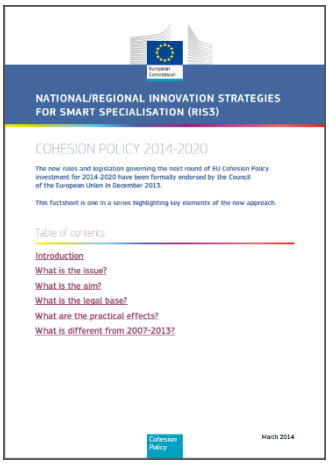
All project partners were asked to provide input from the view of their region. To gain more general information on the RIS3 process a desk top research was carried out on the websites of the European Union as well as on the websites of the partner regions.

Description of the RIS3 Process

A brief summary of the national/regional Innovation Strategies for Smart Specialisation (RIS3) is available in different documents of the European Commission, e.g. in the factsheet about the Cohesion Policy 2014-2020.

The factsheet highlights the new rules and legislation governing in the next round of EU Cohesion Policy investments for 2014-2020 and includes basic information on the RIS3 process.

http://ec.europa.eu/regional_policy/sources/docgener/informat/2014/smart_specialisation_en.pdf


NATIONAL/REGIONAL INNOVATION STRATEGIES FOR SMART SPECIALISATION (RIS3)

COHESION POLICY 2014-2020

The new rules and legislation governing the next round of EU Cohesion Policy investment for 2014-2020 have been formally endorsed by the Council of the European Union in December 2013.

This factsheet is one in a series highlighting key elements of the new approach.

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Introduction
What is the issue?
What is the aim?
What is the legal base?
What are the practical effects?
What is different from 2007-2013?

March 2014

"National/Regional Research and Innovation Strategies for Smart Specialisation (RIS3) strategies) are integrated, place-based economic transformation agendas that do five important things:

- They focus policy support and investments on key national/regional priorities, challenges and needs for knowledge-based development.
- They build on each country/region´s strengths, competitive advantages and potential for excellence.
- They support technological as well as practice-based innovation and aim to stimulate private sector investment.
- They get stakeholders fully involved and encourage innovation and experimentation.
- They are evidence-based and include sound monitoring and evaluation systems."

The European Union has set five ambitious objectives on

- Employment
- **Innovation**
- Education
- Social inclusion
- Climate/Energy

to be reached by 2020.

To meet the goals, the European Countries and Regions are supported by European Structural and Investment Funds (ESIF), for instance European Regional Development Fund (ERDF).
To ensure that the necessary framework conditions for effective use of Union support are in place so called ex-ante conditions in the regions have to be fulfilled.

These conditions are the existence of

- an appropriate regulatory framework,
- effective policy frameworks, and
- sufficient administrative/institutional capacity.

The RIS3 ex-ante conditionality requires EU Member States and regions to identify the knowledge specialisations that fits best their innovation potential, based on their assets and capabilities.
The national or regional authorities have to draw up a document outlining the proposed strategy for the particular country or region.
This strategy should be based on a SWOT analysis to concentrate resources on a limited set of research and innovation priorities. It has to outline measures to stimulate research, technology and development.

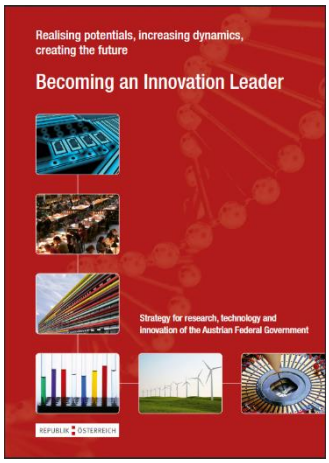
The RIS3 priorities of the countries /regions are sorted in different levels, so-called “NUTS” (Nomenclature des unités territoriales statistiques).

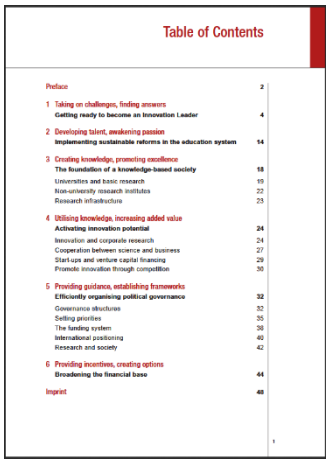
NUTS 0: - Country level
NUTS 1: - major socio-economic regions (grouping basic regions)
NUTS 2: - basic regions (for the application of regional policies)

Some Countries have identified RIS3 priorities on NUTS 0 level others start with NUTS 1 or even with NUTS 2.

RIS3 documents in the PARTNER REGIONS

Austria:





http://s3platform.jrc.ec.europa.eu/documents/20182/89115/RTI_Strategy.pdf/08713cad-6d45-40a8-9e96-16a6f6265087

NUTS 0:

Description	Capabilities	Target Markets	EU Priorities
Life sciences	1. Human health & social work activities	1. Human health & social work activities	1. Public health & security
Service innovation (tourism etc.)	1. Tourism, restaurants & recreation	1. Services	1. Service innovation
Mobility	1. Transporting & storage	1. Transporting & storage	1. Sustainable innovation 2. Smart green & integrated transport systems
Energy & environment	1. Energy production & distribution		1. Sustainable innovation 2. Eco-innovations
Materials & production	1. Manufacturing & industry	1. Manufacturing & industry	1. KETs 2. Advanced manufacturing systems
ICT (embedded systems; micro-electronics; visual computing; semantic systems; quantum informatics; opto-electronics)	1. Information & communication technologies (ICT)	1. Information & communication technologies (ICT)	1. Digital Agenda

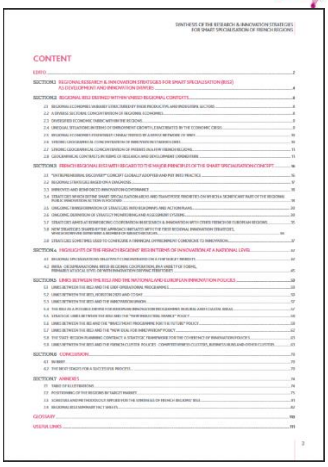
http://s3platform.jrc.ec.europa.eu/regions/at

NUTS 2:
(Oberösterreich)

Description	Capabilities	Target Markets	EU Priorities
Energy (energy efficiency in manufacturing, decentralised systems, smart grids, smart meters, smart village, monitoring energy supply, renewable energy, biogenic processes, building and construction technology)	1. Energy production & distribution	1. Energy production & distribution	1. Sustainable innovation 2. Sustainable energy & renewables
Health & ageing society (IT systems, e-Health, software, virtual surgery, imaging software, medical devices and materials, telemetric, human motion analysis, smart home, ambient assisted living, personalised diagnostics, prevention, therapy)	1. Human health & social work activities	1. Human health & social work activities	1. Public health & security 2. Ageing societies
Food & nutrition (ingredients and modification of food, materials, smart packaging, food quality, quality assurance, food production technologies)	1. Manufacturing & industry 2. Food, beverage & tobacco products	1. Manufacturing & industry 2. Food, beverage & tobacco products	1. Specific local policy priority
Industrial production processes (mechatronics, process automation, materials, ICT, lightweight construction, mathematical modelling, software, IT security, adaptive surface structures, material assessment, energy and resource efficiency)	1. Manufacturing & industry	1. Manufacturing & industry	1. KETs 2. Advanced manufacturing systems
Mobility & logistics (traffic, cross-channel logistics, adaptive supply networks, sensors, intelligent traffic system, supply chain management, engine and vehicle technologies, lightweight construction)	1. Transporting & storage	1. Transporting & storage	1. Sustainable innovation 2. Smart green & integrated transport systems

http://s3platform.jrc.ec.europa.eu/regions/AT31/tags/AT31?rel=1

France:



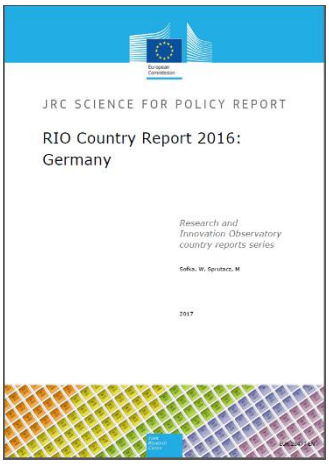
http://s3platform.jrc.ec.europa.eu/documents/20182/90637/cget_sri_si_en-12-2015.pdf/8d04fd5d-b087-4bbf-9abb-7671c9e899ca

NUTS 2:
(Île de France)

Description	Capabilities	Target Markets	EU Priorities
Optics, photonics, and robotics constitute a horizontal theme	1. Manufacturing & industry 2. Machinery & equipment n.e.c.	1. Manufacturing & industry 2. Machinery & equipment n.e.c.	1. KETs 2. Photonics
Intelligent transport without CO2 - simultaneously involving 3 target markets (i) mobility, (ii) health and (iii)energy/environment, this field (among 5) covers the research areas of light materials, mobility-related applications, infrastructures (charging station for electric cars, dynamic parking, intelligent roads, connected urban light).	1. Transporting & storage	1. Transporting & storage 2. Road transport & related services	1. Sustainable innovation 2. Smart green & integrated transport systems
Medical devices: Simultaneously involving 3 target markets (i) mobility, (ii) health and (iii)energy/environment, this field (among 5) deals with diagnosis, treatment and information of patients and surgery, and covers the research areas of handicap treatment and autonomy of the patient. medical devices for diagnosis and treatment of chronic diseases. bio markers. photonics and robotics (eg. robotised surgery)	1. Manufacturing & industry 2. Machinery & equipment n.e.c.	1. Human health & social work activities 2. Human health activities (medical services)	1. Public health & security 2. Public health & well-being
Eco construction - simultaneously involving 3 target markets (i) mobility, (ii) health and (iii)energy/environment, this field (among 5) covers the research areas of smart metering, materials, bio sourced materials, nanomaterials, modelisation, photonics, data acquisition, network management.	1. Manufacturing & industry 2. Nanotechnology & engineering	1. Construction 2. Construction of buildings	1. Sustainable innovation 2. Eco-innovations
Digital creation - simultaneously involving 3 target markets (i) mobility, (ii) health and (iii)energy/environment, this field (among 5) covers the research areas of imaging (3D, virtual imaging, augmented reality..), sound, but also their treatment and transmission (big data, cloud computing...).	1. Information & communication technologies (ICT) 2. Telecommunications	1. Information & communication technologies (ICT) 2. Motion picture, video & television programme production, sound recording & music publishing activities	1. Digital Agenda 2. New media & easier access to cultural contents (e.g. heritage)
Complex systems engineering and software - simultaneously involving 3 target markets (i) mobility, (ii) health and (iii)energy/environment, this field (among 5) covers the research areas of hardware (instruments, captors, optical measurements, industrial robotics) and software (cloud computing, big data, high performance computing, embarked arquitecture, free software, digital infrastructure, digital simulation, advanced manufacturing)	1. Manufacturing & industry 2. Machinery & equipment n.e.c.	1. Manufacturing & industry 2. Machinery & equipment n.e.c.	1. KETs 2. Advanced manufacturing systems

http://s3platform.jrc.ec.europa.eu/regions/fr10

Germany:



https://rio.jrc.ec.europa.eu/en/country-analysis/Germany/country-report

NUTS 0:

Description	Capabilities	Target Markets	EU Priorities
Digital economy & society (industry 4.0, smart services, smart data, cloud computing, digital networks, digital science, digital education & digital life worlds)	1. Information & communication technologies (ICT)	1. Information & communication technologies (ICT)	1. Digital Agenda
Civilian security (civilian security research, cyber-security, IT-security & secure identities)	1. Information & communication technologies (ICT)	1. Public administration, security & defence 2. Public administration, justice, judicial, public order, fire service & safety acitvities	1. Digital Agenda 2. ICT trust, cyber security & network security
Intelligent mobility (intelligent traffic infrastructure, innovative mobility concepts and networks, e-mobility, automotive technologies, aeronautics & maritime technologies)	1. Information & communication technologies (ICT)	1. Transporting & storage	1. Sustainable innovation 2. Smart green & integrated transport systems
Healthy life (combating common illnesses, individualised medicine, prevention and nutrition, innovative care, research on active substances & innovative medical technology)	1. Human health & social work activities	1. Human health & social work activities	1. Public health & security
Innovative work environment (work in a digitalised world, innovative services for future markets & e-Skills and digital competences)	1. Services	1. Services	1. Service innovation
Sustainable economy & energy (energy research - energy storage, electricity grids, photovoltaic construction & energy efficient cities, green economy, bio-economy, sustainable agricultural production, securing provision of raw materials, future city, future construction, sustainable consumption)	1. Energy production & distribution 2. Power generation/renewable sources	1. Manufacturing & industry	1. Sustainable innovation 2. Sustainable energy & renewables

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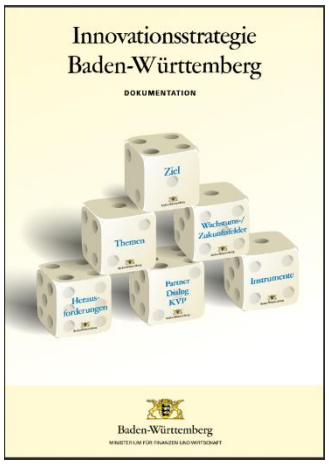
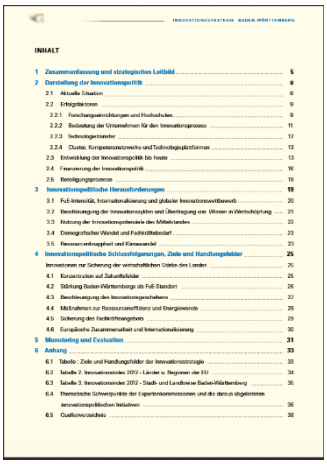
NUTS 1:

(Baden-Württemberg)




INHALT

https://www.efre-bw.de/wp-content/uploads/2015/03/2013-07-15_Innovationsstrategie_Baden-Wuerttemberg.pdf

Description	Capabilities	Target Markets	EU Priorities
Sustainable mobility	1. Manufacturing & industry	1. Transporting & storage	1. Sustainable innovation 2. Smart green & integrated transport systems
Photonics	1. Manufacturing & industry 2. Computer, electronic & optical products	1. Manufacturing & industry	1. KETs 2. Photonics
Biotechnology	1. Manufacturing & industry 2. Biotechnology	1. Manufacturing & industry 2. Basic pharmaceutical products & pharmaceutical preparations	1. KETs 2. Industrial biotechnology
Micro- and nano-technology	1. Manufacturing & industry 2. Nanotechnology & engineering	1. Manufacturing & industry	1. KETs 2. Micro/Nano-electronics
Logistic	1. Transporting & storage	1. Transporting & storage	1. Specific local policy priority
Creative industry	1. Creative, cultural arts & entertainment	1. Creative, cultural arts & entertainment	1. Cultural & creative industries 2. Development of regional cultural & creative industries
Aerospace	1. Manufacturing & industry	1. Manufacturing & industry	1. Aeronautics & space
ICT (green IT; intelligent products; cloud computing; open source software; energy & resource efficiency; sustainable mobility; e-health)	1. Information & communication technologies (ICT)	1. Information & communication technologies (ICT)	1. Digital Agenda 2. Cleaner environment & efficient energy networks (e.g. smart grids)
Health & care	1. Human health & social work activities	1. Human health & social work activities	1. Public health & security 2. Ageing societies
Environmental technologies, renewable energies & resource efficiency	1. Manufacturing & industry	1. Energy production & distribution	1. Sustainable innovation 2. Sustainable energy & renewables

http://s3platform.jrc.ec.europa.eu/regions/DE1/tags/DE1

NUTS 2:
(Thuringia)

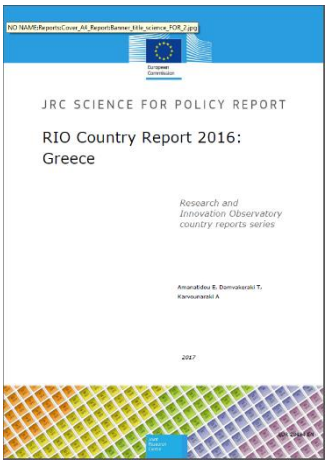
http://www.thueringen.de/th6/tmwwdg/wirtschaft/ris3/

Description	Capabilities	Target Markets	EU Priorities

none

http://s3platform.jrc.ec.europa.eu/regions/DEG0/tags/DEG0

Greece:



http://ec.europa.eu/research/era/pdf/era_progress_report2014/country_fiches/era-el.pdf

https://rio.jrc.ec.europa.eu/en/country-analysis/Greece/country-report

NUTS 0:

Strategic choices for RIS3	1. Investment in creating and disseminating New Knowledge	2. Investment in research and innovation	3. Development of culture and institutions for interconnections between research, technological development and innovation with society
Intervention Axes	**Intervention Categories**		
a. Capacity building	1.a Capacity building in fields of specialisation	2.a Incubation of new business players	3.a Strengthening the mechanisms and institutional framework
b. Strengthening research, technological development and innovation activities	1.b Strengthening research, technological development and innovation activities and excellence islands	2.b Strengthening intrinsic research and innovation in business	3.b. Strengthening demand for innovation in public administration
c. Support mechanisms and structures	1.c Strengthening networking (infra)structures	2.c Innovative entrepreneurship infrastructure and mechanisms	3.c Discovery and Documentation Entrepreneurial Mechanisms
d. Extroversion and networking	1.d. Interconnection and collaboration in research, technological development and innovation	2.d. Entrepreneurial extroversion	3.d Development of an innovation culture

https://www.espa.gr/en/Pages/staticRIS3.aspx

NUTS 2:

Description	Capabilities	Target Markets	EU Priorities
Agricultural-food (production, packaging, food processing, Mediterranean diet)	1. Manufacturing & industry 2. Food, beverage & tobacco products	1. Manufacturing & industry 2. Food, beverage & tobacco products	
Culture and tourism (hospitality, travel agencies, cultural capital, cultural activities)	1. Creative, cultural arts & entertainment	1. Tourism, restaurants & recreation	
Technology and education (research centres, universities, technology park) and especially for agro-food and culture and tourism	1. Services 2. Scientific research & development	1. Services 2. Scientific research & development	

(Kriti)

http://s3platform.jrc.ec.europa.eu/regions/EL43/tags/EL43

Ireland:

http://s3platform.jrc.ec.europa.eu/documents/20182/89527/WEB_Ireland+RIS3+Presentation+3+July+2014+draft+27June.pdf/9e2f0751-7192-41f1-aca6-8d106da53209

NUTS 0:

Description	Capabilities	Target Markets	EU Priorities
Future Networks & Communications	1. Manufacturing & industry 2. Computer, electronic & optical products	1. Manufacturing & industry 2. Computer, electronic & optical products	1. Digital Agenda
Innovation in Services & Business Processes	1. Services	1. Services	1. Service innovation
Processing Technologies & Novel Materials	1. Manufacturing & industry	1. Manufacturing & industry	1. KETs 2. Advanced materials
Manufacturing Competitiveness	1. Manufacturing & industry	1. Manufacturing & industry	1. KETs 2. Advanced manufacturing systems
Smart Grids & Smart Cities	1. Energy production & distribution 2. Energy distribution	1. Energy production & distribution 2. Energy distribution	1. Digital Agenda 2. Cleaner environment & efficient energy networks (e.g. smart grids)
Marine Renewable Energy	1. Energy production & distribution	1. Energy production & distribution	1. Blue growth 2. Blue renewable energy
Sustainable Food Production & Processing	1. Manufacturing & industry 2. Food, beverage & tobacco products	1. Manufacturing & industry 2. Food, beverage & tobacco products	1. Sustainable innovation 2. Sustainable agriculture
Food for Health	1. Human health & social work activities 2. Human health activities (medical services)	1. Manufacturing & industry 2. Food, beverage & tobacco products	1. Public health & security 2. Public health & well-being
Therapeutics – Synthesis, Formulation, Processing & Drug Delivery	1. Manufacturing & industry 2. Basic pharmaceutical products & pharmaceutical preparations	1. Manufacturing & industry 2. Basic pharmaceutical products & pharmaceutical preparations	1. Public health & security
Diagnostics	1. Human health & social work activities 2. Human health activities (medical services)	1. Human health & social work activities 2. Human health activities (medical services)	1. Public health & security 2. Public health & well-being
Medical Devices	1. Manufacturing & industry 2. Electrical equipment	1. Manufacturing & industry 2. Electrical equipment	1. Public health & security
Connected Health & Independent Living	1. Information & communication technologies (ICT)	1. Human health & social work activities	1. Digital Agenda 2. e-Health (e.g. healthy ageing)
Digital Platforms, Content & Applications	1. Information & communication technologies (ICT)	1. Information & communication technologies (ICT)	1. Digital Agenda
Data Analytics, Management, Security & Privacy	1. Information & communication technologies (ICT)	1. Information & communication technologies (ICT)	1. Digital Agenda

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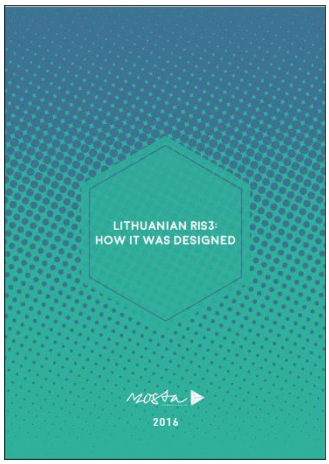
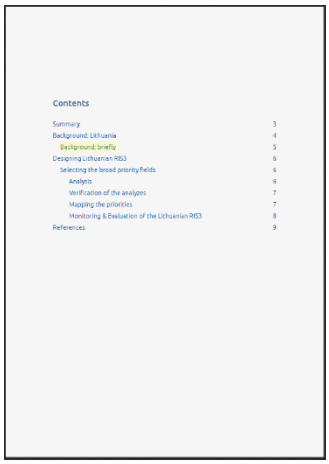
NUTS 2: (Border, Midland and Western; Southern and Eastern) no further S3 priorities

Lithuania:

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http://sumani2020.lt/documents/tyrimai_ir_ataskaitos/sumani2020_tyrimai_ir_ataskaitos_10.pdf

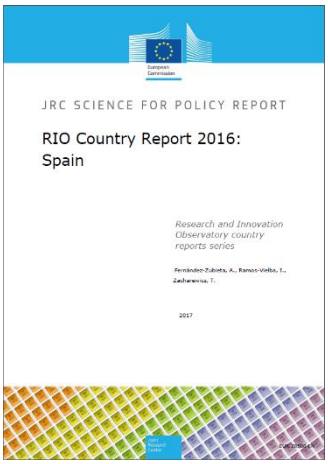
NUTS 0:

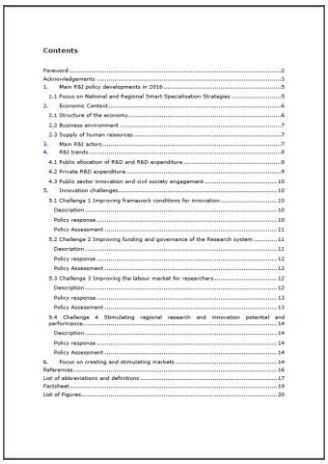
Description	Capabilities	Target Markets	EU Priorities
Energy and sustainable environment: smart systems for energy efficiency, diagnostic, monitoring, metering and management of generators, grids and customers; energy and fuel production using biomass/waste and waste treatment, storage and disposal; technology for the development and use of smart low-energy buildings - digital construction; solar energy equipment and technologies for its use for the production of electricity, heat and cooling	1. Energy production & distribution 2. Power generation/renewable sources	1. Energy production & distribution 2. Power generation/renewable sources	1. Sustainable innovation 2. Sustainable energy & renewables
Health technologies and biotechnologies: molecular technologies for medicine and biopharmaceutics; advanced applied technologies for individual and public health; advanced medical engineering for early diagnostics and treatment	1. Manufacturing & industry 2. Biotechnology	1. Manufacturing & industry 2. Basic pharmaceutical products & pharmaceutical preparations	1. Public health & security 2. Public health & well-being
Agricultural innovations and food technologies: sustainable agri-biological resources and safer food; functional food; innovative development, improvement and processing of biological raw materials (biorefinery)	1. Manufacturing & industry 2. Food, beverage & tobacco products	1. Manufacturing & industry 2. Food, beverage & tobacco products	
New production processes, materials and technologies: photonic and laser technologies; functional materials and coatings; structural and composite materials; flexible technological systems for product development and fabrication	1. Manufacturing & industry 2. Other manufacturing	1. Manufacturing & industry 2. Other manufacturing	1. KETs 2. Advanced materials
Transport, logistics and ICT: smart transport systems and information and communication technologies; technologies/models for the management of international transport corridors and integration of modes of transport; advanced electronic contents, content development technologies and information interoperability; information and communications technology infrastructure, cloud computing solutions and services	1. Information & communication technologies (ICT)	1. Transporting & storage	1. Digital Agenda 2. Intelligent inter-modal & sustainable urban areas (e.g. smart cities)
Inclusive and creative society: modern self-development technologies and processes; technologies and processes for the development and implementation of breakthrough innovations	1. Information & communication technologies (ICT) 2. Computer programming, consultancy & related activities	1. Creative, cultural arts & entertainment	1. Digital Agenda 2. e-Inclusion (e.g. e-Skills, e-Learning)

http://s3platform.jrc.ec.europa.eu/regions/lt/tags/lt?rel=1

NUTS 2: no further S3 priorities

Spain:





https://rio.jrc.ec.europa.eu/en/country-analysis/Spain/country-report

http://s3platform.jrc.ec.europa.eu/documents/20182/111599/The+Spanish+RIS3.pdf/063e4c25-205b-494b-ad03-d5a3990e424f

NUTS 0: no S3 priorities

NUTS 2:
(Castilla-La Mancha)

Description	Capabilities	Target Markets	EU Priorities
Agrofood (e.g. meat, cheese, wine, oil, barley, saffron) gastronomic production, hunting industry	1. Manufacturing & industry 2. Food, beverage & tobacco products	1. Manufacturing & industry 2. Food, beverage & tobacco products	
Traditional manufactures such as footwear, textile, and ceramic materials	1. Manufacturing & industry 2. Textiles, wearing apparel & leather & related products	1. Manufacturing & industry 2. Textiles, wearing apparel & leather & related products	
Aeronautics	1. Manufacturing & industry 2. Motor vehicles & other transport equipments	1. Manufacturing & industry 2. Motor vehicles & other transport equipments	1. Aeronautics & space 2. Aeronautics
Tourism	1. Tourism, restaurants & recreation	1. Tourism, restaurants & recreation	
ICT	1. Information & communication technologies (ICT)	1. Information & communication technologies (ICT)	1. Digital Agenda
Health	1. Human health & social work activities 2. Human health activities (medical services)	1. Human health & social work activities 2. Human health activities (medical services)	1. Public health & security 2. Public health & well-being
Biotechnology (Bioeconomy)	1. Manufacturing & industry 2. Biotechnology	1. Manufacturing & industry 2. Biotechnology	1. KETs 2. Industrial biotechnology
Renewable energies	1. Energy production & distribution 2. Power generation/renewable sources	1. Energy production & distribution 2. Power generation/renewable sources	1. Sustainable innovation 2. Sustainable energy & renewables

http://s3platform.jrc.ec.europa.eu/regions/ES42/tags/ES42

NUTS 2:
(Cataluña)

Description	Capabilities	Target Markets	EU Priorities
Energy and resources (Management of energy and natural resources, the water cycle and waste treatment and recycling, energy saving and efficiency, new, more efficient materials, CHP, automation, energy control and management, renewable energy, organic chemistry, nuclear fusion, innovative materials, construction of buildings and the management of cities)	1. Energy production & distribution 2. Power generation/renewable sources	1. Water supply, sewerage, waste management & remediation activities	1. Sustainable innovation
Cultural and experience based industries (creative and cultural industries and key services for Catalonia, such as tourism and sport)	1. Creative, cultural arts & entertainment 2. Creative, arts & entertainment activities	1. Creative, cultural arts & entertainment 2. Creative, arts & entertainment activities	1. Cultural & creative industries 2. Development of regional cultural & creative industries
Health industries (fine chemicals, pharmaceutical preparations, medical technology industry, insurance industry and hospital system)	1. Human health & social work activities 2. Human health activities (medical services)	1. Human health & social work activities 2. Human health activities (medical services)	1. Public health & security 2. Public health & well-being
Agri-food industry and other links in the value chain (primary industry, distribution, packaging, machinery for the food&drink industry, additives and raw materials, cuisine and restaurants)	1. Agriculture, forestry & fishing 2. Agricultural services	1. Agriculture, forestry & fishing 2. Agricultural services	
Industries based on Sustainable mobility (Management systems for mobility, public transport and infrastructure. automobile industry and related activities. electrochemistry, nanomaterials, Internet, mobile telephony)	1. Transporting & storage	1. Transporting & storage	1. Sustainable innovation 2. Smart green & integrated transport systems
Design-based industries (industries closely linked to design as a key cross-cutting factor: textiles, garment making, leather, footwear, jewellery, furniture, and perfume and cosmetics, amongst others)	1. Manufacturing & industry 2. Textiles, wearing apparel & leather & related products	1. Manufacturing & industry 2. Textiles, wearing apparel & leather & related products	1. Cultural & creative industries 2. Support to link cultural & creative industries with traditional industries
Industrial systems (activities focused on the management and development of efficient industrial systems (plant and machinery, robotics, data-processing, electronic and optical products, and electrical material and equipment), particularly related to process engineering and advanced manufacturing, in which ecodesign plays a key role)	1. Manufacturing & industry 2. Other manufacturing	1. Manufacturing & industry	1. Sustainable innovation 2. Eco-innovations

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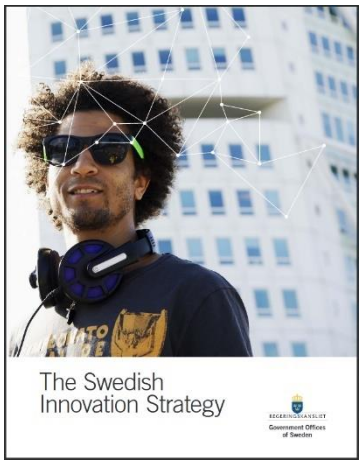
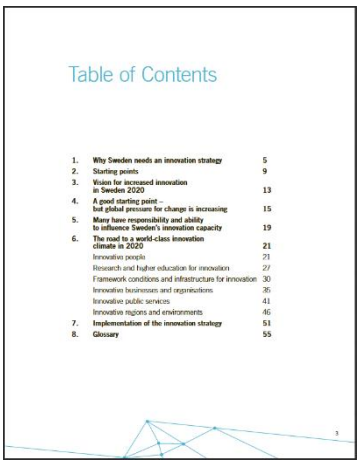
Sweden:

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http://www.government.se/49b758/contentassets/cbc9485d5a344672963225858118273b/the-swedish-innovation-strategy

NUTS 0:

Description	Capabilities	Target Markets	EU Priorities
New bio based materials, products and services	1. Manufacturing & industry 2. Biotechnology	1. Manufacturing & industry 2. Biotechnology	1. KETs 2. Industrial biotechnology
Internet of things	1. Information & communication technologies (ICT)	1. Information & communication technologies (ICT)	1. Digital Agenda
ICT - electric components and systems	1. Manufacturing & industry 2. Computer, electronic & optical products	1. Manufacturing & industry 2. Computer, electronic & optical products	1. Digital Agenda
Graphene - industrial use	1. Manufacturing & industry 2. Other non-metallic mineral products	1. Manufacturing & industry 2. Other non-metallic mineral products	1. KETs 2. Advanced materials
Innovair - aeronautics	1. Manufacturing & industry 2. Motor vehicles & other transport equipments	1. Manufacturing & industry 2. Motor vehicles & other transport equipments	1. Aeronautics & space
Endemic diseases	1. Manufacturing & industry 2. Basic pharmaceutical products & pharmaceutical preparations	1. Manufacturing & industry 2. Basic pharmaceutical products & pharmaceutical preparations	1. Public health & security 2. Public health & well-being
Production 2030 - advanced manufacturing	1. Manufacturing & industry	1. Manufacturing & industry	1. KETs 2. Advanced manufacturing systems
Metallic materials	1. Manufacturing & industry 2. Basic metals & of fabricated metal products	1. Manufacturing & industry 2. Basic metals & of fabricated metal products	1. KETs 2. Advanced materials
Lightweight - materials and constructions	1. Manufacturing & industry 2. Basic metals & of fabricated metal products	1. Manufacturing & industry 2. Basic metals & of fabricated metal products	1. KETs 2. Advanced materials
ICT and automation for industrial processes	1. Information & communication technologies (ICT) 2. Computer programming, consultancy & related activities	1. Manufacturing & industry	1. KETs 2. Advanced manufacturing systems
Mining and metal extraction	1. Mining & quarrying 2. Mining of metal ores	1. Mining & quarrying 2. Mining of metal ores	1. Sustainable innovation 2. Sustainable land & water use

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NUTS 2:

Description	Capabilities	Target Markets	EU Priorities
Sustainable cities	1. Water supply, sewerage, waste management & remediation activities	1. Energy production & distribution 2. Power generation/renewable sources	1. Sustainable innovation

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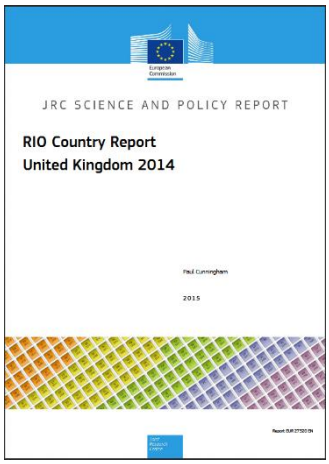
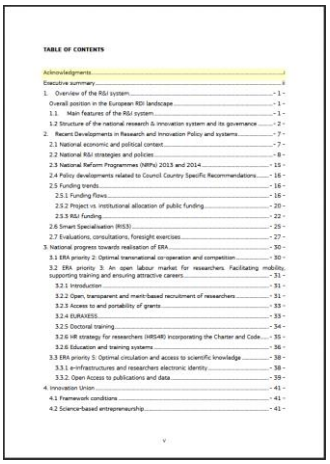
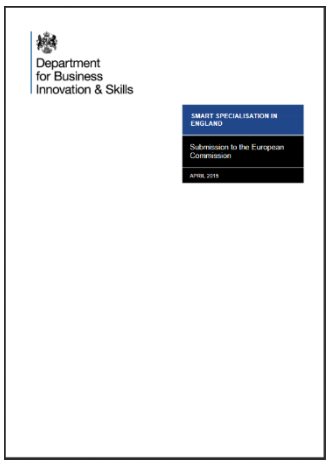
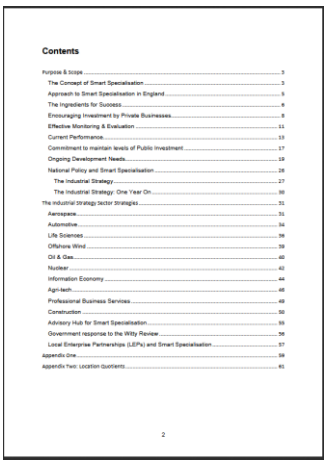
United Kingdom:





https://rio.jrc.ec.europa.eu/sites/default/files/riowatch_country_report/RIO%20Country%20Report%202014-UK_0.pdf





https://www.gov.uk/government/publications/smart-specialisation-in-england

http://gov.wales/docs/det/publications/140313innovationstrategyen.pdf

http://www.gov.scot/Topics/Business-Industry/support/17404/europeanstructuralfundsstateaid/stateaidsmart

https://www.economy-ni.gov.uk/sites/default/files/publications/deti/framework-for-smart-specialisation.pdf

NUTS 0: no S3 priorities

NUTS 1:
(England)

Description	Capabilities	Target Markets	EU Priorities
Aerospace	1. Manufacturing & industry 2. Motor vehicles & other transport equipments	1. Manufacturing & industry 2. Motor vehicles & other transport equipments	1. Aeronautics & space
Automotive	1. Manufacturing & industry 2. Motor vehicles & other transport equipments	1. Manufacturing & industry 2. Motor vehicles & other transport equipments	
Life sciences	1. Human health & social work activities 2. Human health activities (medical services)	1. Human health & social work activities	1. Public health & security
Offshore wind	1. Energy production & distribution 2. Power generation/renewable sources	1. Energy production & distribution 2. Power generation/renewable sources	1. Blue growth 2. Blue renewable energy
Oil and Gas	1. Energy production & distribution 2. Power generation/renewable sources	1. Mining & quarrying 2. Extraction of crude petroleum & natural gas	
Nuclear	1. Energy production & distribution 2. Power generation/renewable sources	1. Energy production & distribution	1. Sustainable innovation 2. Sustainable energy & renewables
Information economy	1. Information & communication technologies (ICT)	1. Information & communication technologies (ICT)	1. Digital Agenda
Agricultural technologies	1. Agriculture, forestry & fishing	1. Agriculture, forestry & fishing	
Professional business services	1. Services	1. Services	1. Service innovation
Construction	1. Construction	1. Construction	

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NUTS 2:
(Greater Manchester)

Description	Capabilities	Target Markets	EU Priorities
Digital economy	1. Information & communication technologies (ICT)	1. Information & communication technologies (ICT)	1. Digital Agenda
Advanced manufacturing	1. Manufacturing & industry	1. Manufacturing & industry	1. KETs 2. Advanced manufacturing systems
Advanced materials	1. Manufacturing & industry	1. Manufacturing & industry	1. KETs 2. Advanced materials
Financial & professional services	1. Services 2. Financial service activities, except insurance & pension funding	1. Services	1. Service innovation
Manufacturing services	1. Services 2. Architectural & engineering activities, technical testing & analysis	1. Manufacturing & industry	1. Service innovation
Connected e-Health & graphene	1. Human health & social work activities	1. Human health & social work activities	1. Social innovation 2. Social innovation with regard to health, well-being & elder care

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NUTS 1:
(Wales)

Description	Capabilities	Target Markets	EU Priorities
Low carbon energy. Smart Living. Eco innovation	1. Energy production & distribution 2. Power generation/renewable sources	1. Energy production & distribution 2. Power generation/renewable sources	1. Sustainable innovation 2. Eco-innovations
ICT trust and cyber security	1. Information & communication technologies (ICT)	1. Information & communication technologies (ICT)	1. Digital Agenda 2. ICT trust, cyber security & network security
Wound healing. Neuroscience. Medical devices	1. Human health & social work activities 2. Human health activities (medical services)	1. Human health & social work activities 2. Human health activities (medical services)	1. Public health & security 2. Public health & well-being
e-health. Health informatics	1. Human health & social work activities	1. Human health & social work activities	1. Digital Agenda 2. e-Health (e.g. healthy ageing)
Drug discovery	1. Manufacturing & industry 2. Basic pharmaceutical products & pharmaceutical preparations	1. Manufacturing & industry 2. Basic pharmaceutical products & pharmaceutical preparations	1. Public health & security 2. Public health & well-being
Food security	1. Services 2. Scientific research & development	1. Services 2. Scientific research & development	1. Public health & security 2. Public health & well-being
Advanced materials. Photonics. Compound semi conductors	1. Manufacturing & industry 2. Computer, electronic & optical products	1. Manufacturing & industry 2. Computer, electronic & optical products	1. KETs 2. Photonics
Materials evaluation and testing. Maintenance, Repair and Overhaul (MRO)	1. Manufacturing & industry 2. Motor vehicles & other transport equipments	1. Manufacturing & industry 2. Motor vehicles & other transport equipments	1. KETs 2. Advanced materials

http://s3platform.jrc.ec.europa.eu/regions/UKL/tags/UKL

NUTS 1:
(Scotland)

Description	Capabilities	Target Markets	EU Priorities
Food & beverages	1. Agriculture, forestry & fishing 2. Crop & animal production, hunting & related service activities	1. Manufacturing & industry 2. Food, beverage & tobacco products	
Energy	1. Energy production & distribution 2. Power generation/renewable sources	1. Energy production & distribution 2. Energy distribution	
Universities	1. Services 2. Education	1. Services 2. Education	
Tourism	1. Tourism, restaurants & recreation	1. Tourism, restaurants & recreation	1. Specific local policy priority
Life sciences	1. Manufacturing & industry 2. Basic pharmaceutical products & pharmaceutical preparations	1. Human health & social work activities 2. Human health activities (medical services)	1. Public health & security 2. Public health & well-being
Creative industries	1. Creative, cultural arts & entertainment	1. Creative, cultural arts & entertainment	1. Cultural & creative industries 2. Development of regional cultural & creative industries
Marine energy	1. Energy production & distribution 2. Power generation/renewable sources	1. Energy production & distribution 2. Power generation/renewable sources	1. Blue growth 2. Blue renewable energy
Financial & business services	1. Services 2. Financial service activities, except insurance & pension funding	1. Services 2. Financial service activities, except insurance & pension funding	1. Service innovation 2. New or improved service products (commodities or public services)

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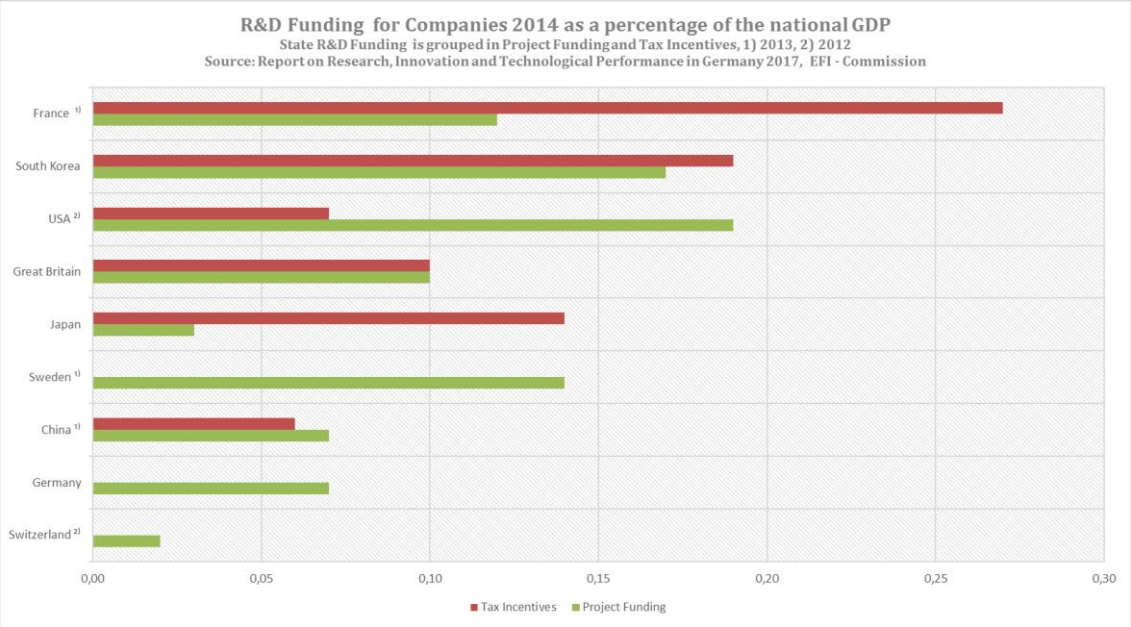
Experiences in the Regions

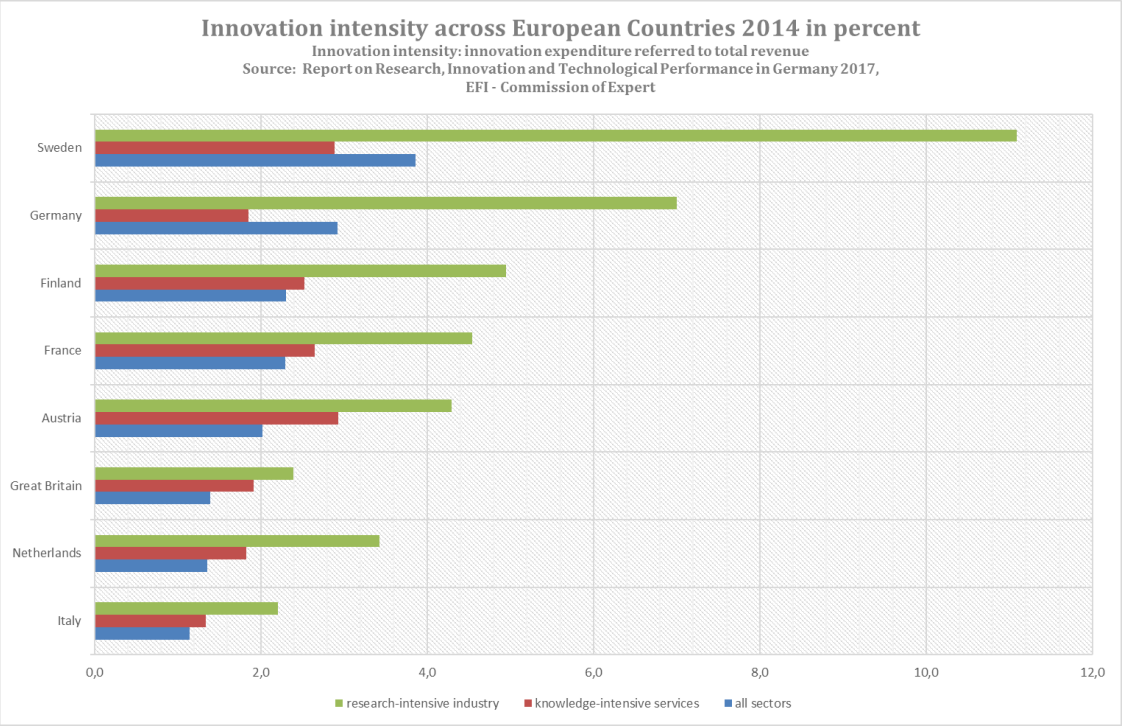
The smart specialization strategy is normally included in a national or regional research and innovation strategic policy framework which can be quite different in the countries. The wide range of specific federal and state programmes makes the funding options complex for companies applying for subsidies.

In the framework of Deliverable D3.5 a list of best practices of how policy supports enterprises and clusters was compiled. Experiences show that the amount of work associated with applications for subsidies is harder to shoulder for small businesses than for larger corporations. That's why most of the (European) countries use a combination of R&D funding and special project funding to support companies in smart specialization. However, this is not true for Germany and Sweden. The following picture illustrates this situation.



The promotional effects of R&D funding through tax incentives are particularly remarcable in the case of SMEs and have to be taken into account in an analysis of the budgetary resources planned in the RIS3 strategy process. This approach is taken on in Great Britain, France and other OECD countries. Instead, public support strategies in Germany and Sweden rely more on project funding.

The photonics industry is a research-intensive industry and needs a lot of resources to perform successfully on the markets. Within the German photonics industry the average reinvestment in R&D is 10% of the annual turnover. In the partner regions of the RespiceSME project the situation is similar as shown in the following graph.



Having this in mind it is very important for photonics SMEs to use the possibilities a smart specialization process in the particular regions offers.

But the experiences in the project partner´s regions concerning the involvement of SMEs in the RIS3 process are very diverse, ranging from being strongly involved to being involved only marginally. This is true for photonics SMEs as well as for photonics clusters.

From the photonics clusters point of view a few examples may explain this in more detail:

1. In **Austria** the photonics cluster was involved in the RIS3 process, especially through the EuroPho21 project and is currently involved in the monitoring process as well. In contrast, the photonics SMEs are not involved. Photonics doesn't occur as a RIS3 priority directly, but is virtually included in the field of ICT. Currently there are discussions of possible cooperation in photonics with other European regions under the framework of RIS3 supported by the federal ministry of transport, innovation and technology.
   At the moment it is very difficult to assess how the results of the RIS3 process support the SMEs innovation performance and how the process supports the cluster.

2. In **France**, the cluster Opticsvalley (OV) was highly involved in the RI3S process: during summer 2016, the cluster issued a strategic document about Photonics in the Paris region. OV took part of 4 working groups set up by the Paris region authority (Conseil Régional d'Ile de France - CRIF), with photonics SMEs members of the

cluster. OV's board of directors (composed of 13 SMEs and 13 academic representatives) validated this strategic document and submitted it officially to the CRIF.
Regarding the R&D strategy in the Paris region, Photonics has not been identified as a sector of major interest, so OV is managing a strategic committee composed of industrial leaders (such as Thales, PSA and a Safran subsidiary company…) to work on the redefinition of the research strategy of the region.
One of OV's success within this regional lobbying was to obtain a one-stop-shop for Photonics at the CRIF.
Finally, OV has been coordinating an ERDF project in 2016 & 2017, providing financial support for SMEs in the Photonics sector (50% of co-financing for participating in international exhibitions & access to counseling).

At a national level, OV is working on a roadmap in 2017 for Manufaturing, together with the French National Committee of Photonics (CNOP), and is setting up working groups with representative companies from the sector.

3. In **Germany** the grade of photonics SME participation in the RIS3 process is quite diverse in the different states.
   Although Germany has a strong photonics industry with 31 bill. Euro annual turnover the KET "Photonics" doesn't occur on the national RIS3 priority list (NUTS 0).
   If one looks closer at the strategies in place in the different states and the role photonics SMEs and clusters play in the RIS3 process one can find regions with marginal involvement and others with strong participation.
   In case of **Baden-Wurttemberg**, like in other states, too, the cluster wasn't involved in the smart specialization process, but is currently contributing to the process. For instance, the indicators of the Photonics BW project "Photonics Innovation Booster" (EFRE) are taken into account as well as input from dialogue and expert forums, in which the cluster participates. However, photonics SMEs are not the primary actors in the process.
   Baden-Wurttemberg identified several areas of growth including photonics (NUTS1). Identified KETs to support are: micro and nano technology, biotechnology and photonics.
   As a result of this process the areas of growth, innovative key areas, KETs and core sectors will be supported in R&D, new market and product field development in the framework of the RIS3 strategy.

   SMEs benefit from the strategical development of the regional research infrastructure and the improvement of access to regional research capacity for SMEs as well as from increased networking between science and industry and the improvement of the economic technology transfer. The targeted promotion of scientific and entrepreneurial talent, time and other resources for researchers and an increased permeability between the professional and the academic field are sustainable support for SMEs.
   Baden-Württemberg advocates for the expansion of research in the growth areas, as well as with regard to innovative cores and in the KETs. This comprises the support

of SME-specific technology transfer formats to strengthen the innovation capacity of the middle class, sustainable support of application-oriented and business-related science and research, strengthening Baden-Wurttemberg as a country of inventors and entrepreneurs, the establishment and development of regional cluster initiatives and nationwide networks, securing skilled employees, support of European and international cooperation, accelerating innovation cycles and transferring knowledge to value creation. To achieve these objectives funding programmes for regional SMEs and clusters as well as political and economic incentives are installed.
In this context funding programmes for the establishment and development of regional cluster initiatives and nationwide networks constitute the largest part.

In case of **Thuringia** the photonics cluster and selected photonic SMEs were involved in the RIS3 process from the very beginning.
More than 500 stakeholders representing the business sector, the scientific community, and various intermediaries took part in the process of identifying the region's most promising areas of growth and using these findings as a basis to develop a shared vision for Thuringia. The result is "RIS3 Thuringia," a Thuringian Innovation Strategy comprising five fields of innovation.
Five working Groups - one for each of the innovation fields defined by the topics it addresses - play the central role in implementing the innovation strategy. These working groups meet regularly in order to identify new focuses for development and to kick-start various projects.
Photonics is a major part of the field of specialization "Industrial production and systems".
Photonics Cluster and photonics SMEs are still involved in the monitoring system and in the creation of a master action plan, constituting the framework for local project calls.

4. In **Ireland,** the different educational, industrial and research developmental government agencies, local authorities, representative bodies and regional experts contributed to the development and review of the Smart Specialisation strategies. The participation of individual researchers or SMEs were not encouraged to contribute on their own but could participate indirectly by more established representative bodies.

5. In **Greece** and specifically in the region of **Crete** the presence of the Foundation for Research and Technology-Hellas (FORTH) and top level universities with internationally acclaimed research and educational potential, strongly influenced the adoption of the Knowledge Complex as a priority for the region. Within this priority, Photonics is one of the suggested technologies but is also indicated as an enabling technology for the other identified priorities e.g. agro-alimentary, cultural-touristic and environmental. One of the main aims of the Knowledge Complex priority is that regional Research and technology Organizations (RTOs) could, under the right conditions, support the development of new entrepreneurial activities in

emerging sectors and expand Crete's productive base in terms of competitiveness. Senior executives of the regional RTOs along with prominent representatives of the general business sector were actively involved in the identification of the above priorities.
The program is now at the phase of entrepreneurial discovery where input is gathered from all relevant stakeholders (Including SMEs) in order to narrow the focus of interventions and enhance the specifications of the actions.

6. In **Lithuania** the cluster was not directly involved in the national RIS3 process, but the representatives of the laser companies which are members of the cluster were. They took an active part in defining one of the thematic priorities "Photonic and laser technologies". The priority covers research and development in different areas, e.g. short pulse lasers, optics and optomechanical components or LEDs of special purpose. An extensive action plan to carry out R&D activities in these areas has been developed with the contribution of the SMEs.
However, the photonics SMEs are not involved in the current monitoring of the smart specialization process at this point.
In Lithuania photonics is one of the smart specialization priorities under the priority area "New production processes, materials and technologies".
As a result of the RIS3 process the photonics SMEs are able to access ERDF funding for R&D projects. The cluster also got access to ERDF funding to support the smart specialization process.

7. In **Spain** the cluster SECPhO is involved in the RIS3 process. The development performed in 2014 took into account 6 different parameters: EC's methodology, evidences and previous consens, government leadership and interdepartmental coordination, collaboration with other regions, coordination with national and European policies and participation of the key players in the research, development and innovation (R+D+i) system
Users, R+D+i, companies and administration participated in a bidirectional and iterative manner to the elaboration of RIS3CAT guidelines in a public consultance in which SECPhO toke part. According to the data provided by the Catalan government, the participants of the public consultance in proportion of data comprised unversities (28%), Research Centers (19%), Technology centers (7%), Companies (21%), Public administration (5%), others (20%).

8. In **Sweden** the photonics cluster was involved in the new industrialization strategy (innovation bill 2016) as one of the KET partners.

   The Stockholm region asked PhotonicSweden explicitly for expert input for their strategy. In the framework of the EU projects Europho21 and EPRISE, PhotonicSweden is in contact with the regions, expecially Stockholm, Skania (Lund, Malmö) and Västra Götaland (Gothenburg) in order to lobby for photonics and life sciences. PhotonicSweden is not involved in the monitoring process this is done by other representative bodies. Photonic SMEs were not asked for input to the smart specialization strategy. Photonics is not chosen as a priority in the RIS3 process, but,

as in other regions as well, hidden in the “advanced manufacturing field, ICT and Life Sciences”.

9. Further to the Smart Specialisation reports in the **UK** a Smart Specialisation Hub http://smartspecialisationhub.org was established led by the KTN. A process for Science and Innovation Audits (SIAs) was carried out to identify and validate areas of potential globally competitive advantage across the UK to help underpin future investment decisions, foster local collaboration and strengthen future bids for local investment. To achieve this, the Government invited consortia of universities, research and innovation organizations, Local Enterprise Partnerships (LEPs) and their equivalents in the Devolved Administrations, and businesses to work with the Government to map the science and innovation strengths of their areas.

   SIAs involve combining national data sets with a “grass roots” view based on local data, knowledge and experience to examine an area’s strength in science and innovation and relate these to a national and international context. The data and analysis generated by the SIAs is aligned with the work of the Smart Specialisation Hub, which has been tasked with building the evidence base and developing a community of best practice around smart specialisation in England.

   There are at least 3 waves of reports planned for the SIAs. Wave 1 report is available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/565261/science-innovation-audits-wave-1-summary-report.pdf

CONCLUSIONS and RECOMMENDATIONS

The RIS3 smart specialization process is a very important measure for photonics SMEs and photonics clusters to find themselves in an appropriate strategic position to promote photonics and in getting access to ERDF funding.

On the other hand our analysis showed clearly that the whole smart specialization process – from the definition of the specialization fields through the implementation of the actions to the monitoring – is very complex and time consuming.
Because of this, especially smaller SMEs avoid to be involved in the process over a long time. Photonics clusters along with RTOs and policy makers can support their members in this process, ensuring that their smart specialization strategies are implemented for maximum economic development.

The experiences in France and Germany (Thuringia) can serve as a best practice example for regions where Photonics is not an explicit RIS3 priority area.

In France (Paris region), there has been very important work done by Opticsvalley for promoting the Photonics sector, showing its potential and the various applicative markets it

can nourish. This has led to a closer cooperation with the regional representative authority, which is now more aware of the Photonics industry potential, and thus more open to provide financial support.
Within the scope of its participation in the "National Committee of Optics-Photonics" and its collaboration with the French photonics cluster "Route des Lasers", Opticsvalley was at the initiative of creating a committee composed of 5 academic and industrial representatives in charge of defining a regional roadmap for industrial applications of lasers and very large research infrastructures (ELI type). The committee held trimestral meetings during which proposals were made by its members. Opticsvalley's actions were financed by Ile-de-France Region, the academic and industrial members volunteered for this initiative and were financed by their own structures. The committee was established in the last trimester of 2015 and held regular meetings ever since. Other commissions on photonic markets analysis, key success factors for start-up development and private investment opportunities are planned.

In Germany (Thuringia) the cluster OptoNet was involved in the RIS3 process from the very beginning. However, it turned out that photonics is not a direct priority field in the region. Instead, four fields of specialization serve as the main pillars of RIS3 Thuringia:

- Industrial production and systems
- Sustainable and smart mobility & logistics
- Healthy living and the healthcare sector
- Sustainable energy supply and resource management

Photonics as an enabling technology is present in all these areas and especially well established in the area "Industrial production and systems". The cluster OptoNet is still a main partner in the area related working group. In this working group the concrete action plans are prepared creating the strategic framework for the fields of specialization and are the basis for local project calls. Being present in the working groups and panels the cluster can support the regional photonics SMEs in an effective way. As an output of this work the regional technology platform "Tailored optical fibers" was launched as well as an innovation center "Sensor technology and Optics/Photonics".

For optics clusters it is therefore highly recommended

- to be involved in the RIS3 process from the very beginning
- to keep involved in the process via working groups and panels because strategic frame works are refined continuously
- to assist in elaborating field specific indicators
- to support the RIS3 evaluation process

with the general goal to support their regional photonics SMEs.

Furthermore European cluster projects can help to share the specific smart specialization strategies and support the cluster managers, SMEs and policy makers in joint activities.

This report advises SMEs to become familiar with smart specialization strategies of their region and to work closely with larger regional entities to affect change where needed. In

any case it is the first choice for SMEs to take part in the smart specialization process directly and keep involved despite its time-consuming procedure.

This is especially advisable for partner regions with R&D funding without tax incentives but via special project funding (see also list of best practices in Deliverable D3.5).

APPENDIX

Abbreviations:

NUTS 0,1,2,3	*Nomenclature des unités territoriales statistiques, Classification/Level of Administration units*
RIS3	*National/Regional Innovation Strategies for Smart Specialisation*