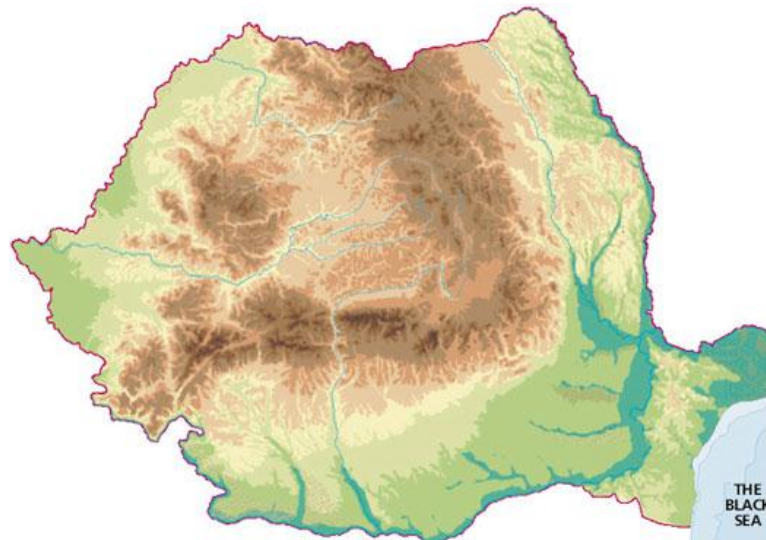


Romania: Towards an RDI strategy with a strong smart specialisation component



- Dublin, 3-4 July 2014
- Radu Gheorghiu

•Romanian Strategy for RDI 2014-2020

- The National Strategy for RDI 2014-2020 – currently in the approval stage

- A national RDI strategy with a strong smart specialization component*

- Vision:

"Underlying national competitiveness there is an innovation ecosystem where research and development support the advancement in the global value added chains. In this environment, excellence and an entrepreneurial spirit mobilize a critical mass of actors."

Vision's 3 pillars:

- Companies become key actors of innovation
- The RDI sector is an arena of opportunity
- Regional leadership at the frontier of science through breakthroughs in strategic fields

- Regional level – not a distinct level (Romania does not have either proper legal regions, or a proper regionalisation strategy); rather, considered in terms of local/regional concentrations of RDI activity and skills.*



Table 1: DOMAINS WITH SMART SPECIALISATION POTENTIAL

PREPARATORY JASPERS / ARUP STUDY



Economic sector	Specialisation area
Main domains	
Agriculture and Food Industry	Agro-Food, Biotechnology
IT&C	Telecommunication and Software / Computer Programming , Mechatronics, New Media, Application Development
Automotive Industry and Other Transport Equipment	Materials, Components and Fabrication, Ship Building, Aerospace, Agricultural machinery
Other domains with potential	
Tourism	Health Tourism, Wellbeing
Wood Industry	Wood Processing, Conversion of Waste
Energy	Renewable Energy, Wind Power, Solar Power, Green construction, Biomass, Ecological Services, Fossil Energy, Gas and Electricity, Maritime Oil Extraction
Machinery and Equipment	Intelligent Agriculture, Automation, Mechatronics
Textiles	Technical Textiles
Chemical and Pharma Industry	Cosmetics, Life Science, Health
Scientific domain	
IT&C	Networks of the future, internet and services, software and visualization, networked media and 3D internet, flexible organic and large area electronics, embedded system design, personal health system, ICT for energy efficiency and accessible and assistive ICT, Computer science and artificial intelligence.
Engineering and Technology	Electrical and electronic engineering, nanotechnology, materials (specifically electronic, optical and magnetic materials, materials chemistry, materials science and metals and alloys) and mechanical engineering, motor vehicle transport and other transport
Energy and Environment	Pollution, management and monitoring, environmental engineering, ecology and environmental science, network technologies, renewable energy and biofuels.
Agriculture and Food Industry	Agronomy, crop science, food science and agricultural and biological science, agricultural biotech
etc.	



•Exploration and discovery

•National level

•Main competitive advantages:

(1) ICT skills supported by STEM education; (2) Great agro-food potential (but currently under-utilised); (3) Transportation / motor vehicles

•Key challenges:

(1) Stimulating business investment in research; (2) Bridging business and public research; (3) Low technology transfer rates and a weak culture of entrepreneurship

•Main opportunities for future regional development:

(1) Large-scale infrastructures (e.g., ELI-NP) and associated hubs; (2) Danube Institute / Initiatives; (3) Competence poles (e.g., Cluj, Magurele)

•Main objectives of the strategy

- To increase the competitiveness of the Romanian economy through innovation
- To enhance the Romanian contribution to the progress of frontier knowledge
- To enhance the role of science in society

•Procedural principles:

- an evidence-based approach;
- responding to a broad range of relevant criteria, among which: proven scientific performance; the potential for adding value (in the economy, public services, public decision-making etc.) to the results of research; Romania's broader strategic interests.
- a flexible understanding of a "priority field" – not a scientific domain, but one at the intersection of science, technology, and societal needs and problems;
- future-oriented

•*Regional level -- not considered as such, except in terms of local/regional concentrations of RDI activity and skills.*



•Exploration and discovery

•National level

•Key stages in designing the smart specialization component of the RDI Strategy:

- ✓ Evidence-based *preliminary selection of candidate fields* of smart specialization based on current and future business potential and Romanian research specialisations at a national and international level (JASPERS/ARUP study, analyses of sectoral competitiveness on a national level, capability and competitiveness of clusters at a regional level, current R&D potential, analysis of national and international RDI collaborations etc.);
- ✓ Online consultation with RDI experts and stakeholders – *proposals of promising R&I programs* for each candidate field; arguments to back up proposals;
 - *Shortlisting of 13 fields* by large panel after consultations with key actors;
- ✓ Panel work (13 panels) to *flesh out the shortlisted fields* – elaboration of 6-8 R&I program fiches per field according to smart specialization-specific criteria;
- ✓ Large-scale online consultation of experts and stakeholders on the 90 R&I fiches – *quantitative evaluation, backed up by pro/con arguments*; estimate of necessary resources, incl. human, logistic, cost;
- ✓ *Selection of final smart specialization fields / R&I programs.*
 - *Key criterion (50%) – economic impact*; final fields – highest ranking fields that, together, reached the cost threshold of 5 billion lei (optimistic estimate of RDI budget over programming period).

29 domains

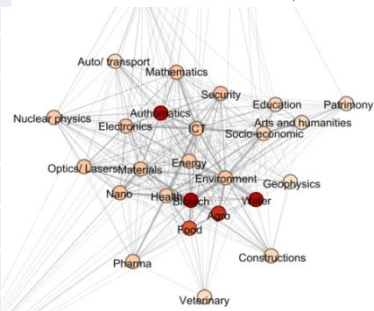
Aerospace
Agro
Food
Water
Arts & humanities
Auto/ transport
Automatisation
Biotech
Constructions
Education
Electronics
Energy
Pharma
Nuclear phys.
Geophysics
ICT
Mathematics
Materials (new)
Veterinarian
Environment
Nanotech
Naval
Optics
Patrimony
Health
Security
Socio-economic
Space
Textiles

13 Panels

Agro-Food
ICT
Intelligent sys.
Health
Energy
Pharmaceuticals
Environment
Security
Space
Materials
Biotechnologies
Transport
Socio-economic

+

Exploratory
Online consultation

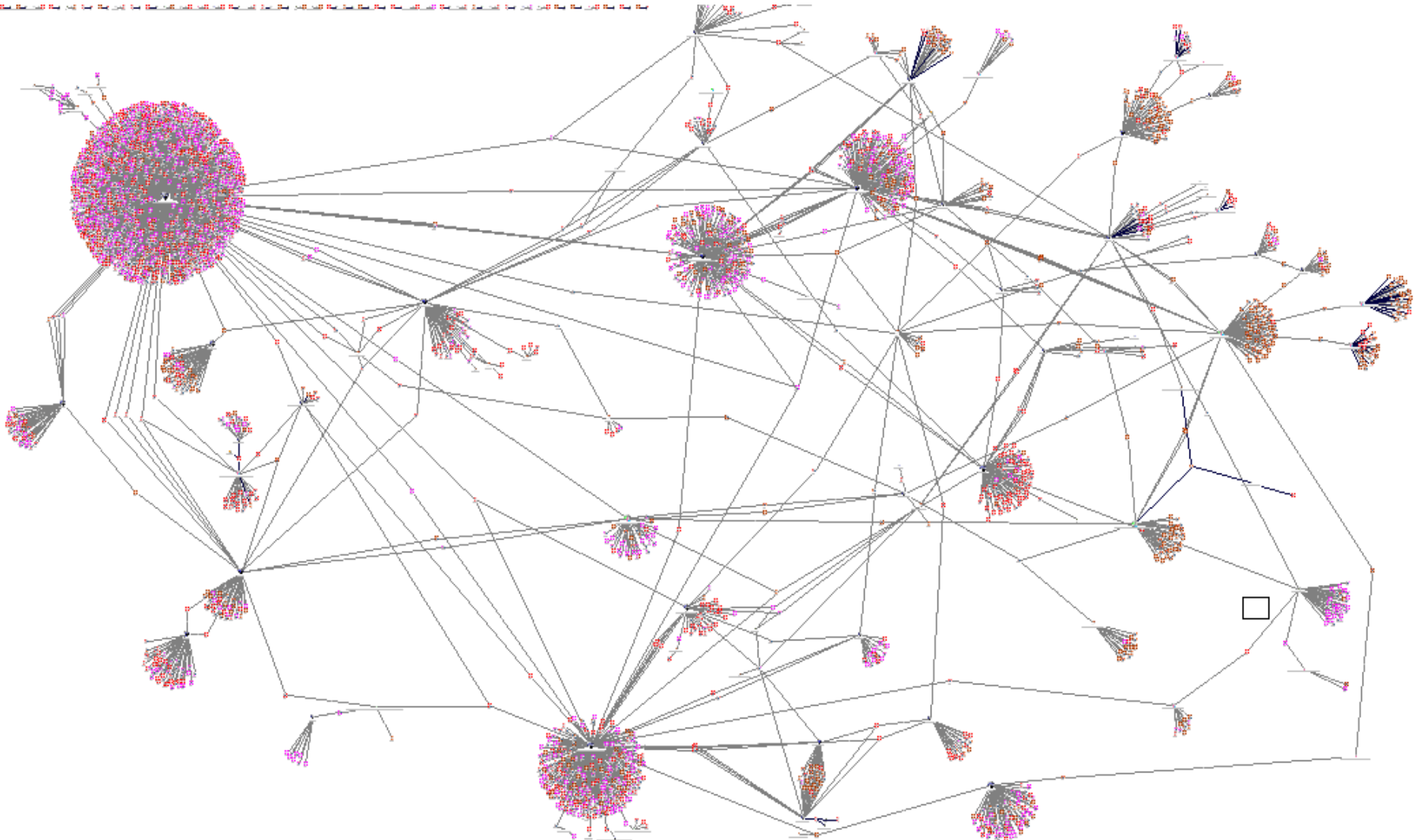


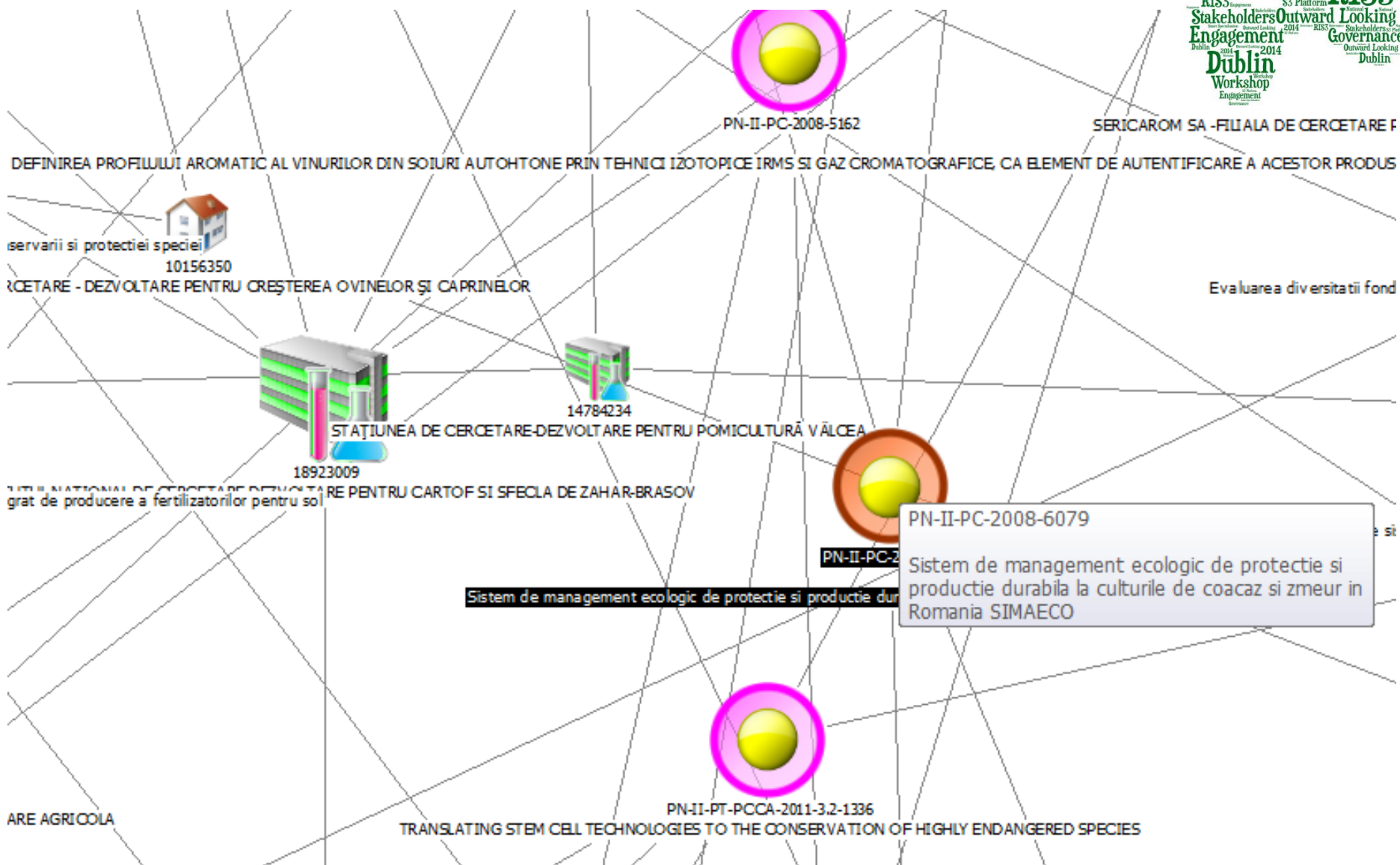
90
Micro-visions

Argumentative
online
consultation



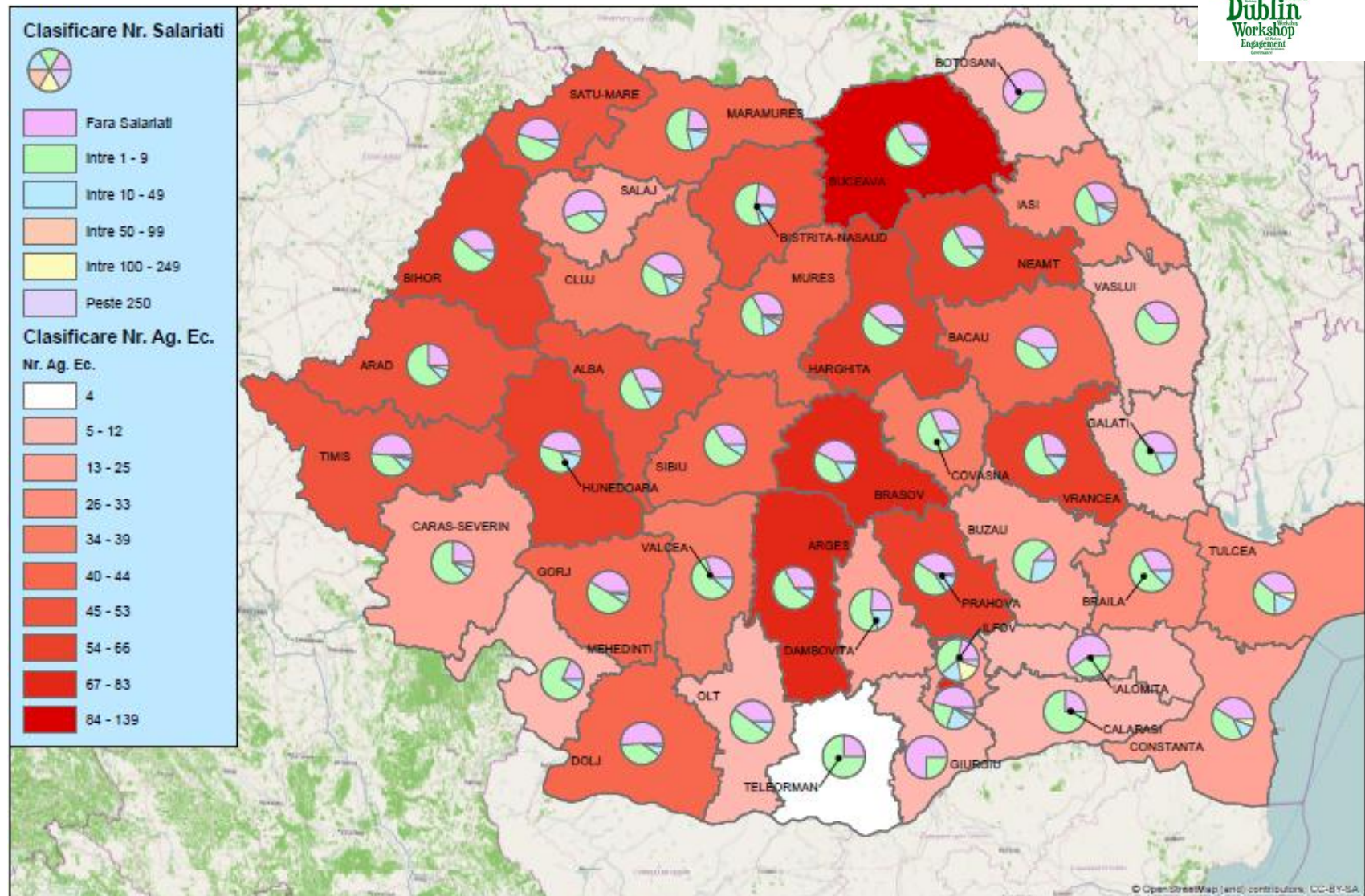
Example: Institutions with ISI publications in agro-food





Knowledge maps

Example: Companies in Pharma



Source: UEFISCDI, based on NIS data

Example: Export and import countries for pharmaceuticals

Example: Export and import countries for pharmaceuticals



•Exploration and discovery

Exploratory online consultation (June 2013)



CUNOAȘTEREA ȘI INOVAREA CONTEAZĂ

CHESTIONAR DE NOMINALIZARE A EXPERTILOR ȘI DE IDENTIFICARE A SUBDOMENIILOR DE CERCETARE/ INOVARE ÎN CADRUL PROIECTULUI

ELABORAREA STRATEGIEI NAȚIONALE ÎN DOMENIUL CERCETĂRII, DEZVOLTĂRII TEHNOLOGICE ȘI INOVĂRII PENTRU PERIOADA 2014-2020

1. Lista de mai jos cuprinde titlurile celor 13 domenii strategice candidată pentru Strategia de CDI 2014-2020. Aceste domenii, menite să structureze dezbaterile privind prioritățile naționale de CDI, au fost selectate în urma unui proces complex, în funcție de oportunitățile pe care le deschid pe viitor și de impactul lor social potențial.

Va invităm să identificați domeniul în care vă considerați expert. Dacă experiența dvs. acoperă mai multe domenii, vă rugăm să selectați acel domeniu în care considerați că ați putea să aduceți contribuția cea mai semnificativă ca expert.

☐ Agro-alimentare ☐ Mediu ☐ Spațiu
☐ Biotehnologii ☐ Sănătate ☐ Știința medicamentului
☐ Energie ☐ Securitate ☐ Transporturi
☐ ICT ☐ Sisteme inteligente
☐ Materiale ☐ Socio-Economice

2. Va rugăm să propuneți, în vederea Strategiei de CDI 2014-2020, principalul subdomeniu de cercetare/ inovare (din cadrul domeniului candidat selectat mai sus) care considerați că ar putea, în mod realist, să contribuie la competitivitate pe lanțurile globale de valoare și la creșterea bunăstării pe termen mediu și lung.

Va rugăm să oferiți informații cât mai concrete și mai specifice pentru a vă susține propunerea.

Subdomeniile au natura unui set de teme de cercetare înrudite și trebuie definite nu doar în termenii relevanței lor strict științifice, ci și în funcție de problemele tehnologice și sociale asupra cărora vor avea impact la orizontul 2020. Subdomeniul propus va fi înaintat panelului de experți pe domeniul respectiv și, apoi, supus consultării largite pentru a fi dezbătut, analizat, rafinat și, eventual, adoptat ca subdomeniu prioritar.

Exemplul de formulare a subdomeniilor poate fi consultat în subsolul casetei, este pur orientativ și aparține domeniului tehnologiei informației și comunicării (ICT).

Introduceți aici denumirea subdomeniului propus:

Răspuns:

Exemplu: Reducerea amprentei ecologice în tehnologia informației și comunicărilor (ICT)

2.1. Provocarea

Exemplu: În viitorul imediat, un număr urias de persoane și obiecte vor fi conectate la internet. Va crește nu doar numărul de produse electronice utilizate constant, ci și traficul de date, care vor trebui stocate și procesate permanent. Amprenta de carbon lăsată de aceste evoluții va fi tot mai importantă. Deja în 2007, amprenta atribuită domeniului ICT era de 2% din toate emisiile de carbon - echivalentă celei asociate industriei aviației la nivel mondial. Este de așteptat ca această să crească la 4% până în 2020 (The Climate Group, G8&I Report, Smart 2020, 2008).

2.2. Nevoia de cercetare/ inovare

Sectiunea descrie pe scurt modul în care cercetarea/ inovarea românească poate răspunde, în intervalul 2014-2020, tendințelor, provocărilor sau problemelor identificate anterior.

(maxim 1200 caractere)

Răspuns:

Exemplu: Cercetarea în domeniul reducerii amprentei ecologice a ICT poate acoperi un spectru larg de teme, de la produsele electronice cu consum redus, arhitecturi și protocoale verzi, sau managementul inteligent și optimizarea serviciilor și rețelelor, până la noi modele de inovare și de afaceri în domeniul ICT care să sporească economia de energie (de ex., prin introducerea unor informații sau opțiuni privind amprenta energetică în designul produselor). Cercetarea/ inovarea în domeniu poate beneficia și de analiza socială (de ex., privind comportamentul consumatorilor) sau de studii de planificare urbană (de ex., privind orașele inteligente).

2.3. Precondiții

Sectiunea descrie premisele care pot favoriza succesul subdomeniului de cercetare propus: existența unui mediu de cercetare favorabil (masa critică de cercetători, portofoliu de cercetări și publicații etc.), oportunități de parteneriat cu mediul de afaceri s.a.m.d.

(maxim 1200 caractere)

Răspuns:

Exemplu: Sectorul ICT din România este deja unul foarte dezvoltat, cu o forță de muncă bine pregătită și certificată în mod adecvat și, cu toate acestea, încă sub-utilizată. România ocupă o poziție strategică în raport cu piața europeană de produse și servicii ICT și are o tradiție în cercetarea în acest domeniu. Aproape toate multinaționalele din branșă, pentru care tema identificată în această propunere constituie deja o prioritate, sunt actualmente prezente în țară, iar unele dintre ele au și centre de cercetare-dezvoltare. În plus, subtemele amintite au făcut subiectul unui număr considerabil (n) de proiecte de cercetare, iar cercetătorii români au o prezență vizibilă în publicatiile relevante. Există deja o colaborare solidă cu un important producător de semiconductori pe această temă.

2.4. Perspective și potențial

Ce așteptați, în mod concret, în urma prioritizării subdomeniului de cercetare? Care sunt efectele (locale și/sau globale) anticipate de dvs.? Cum arată succesul subdomeniului propus?

(maxim 1200 caractere)

Răspuns:

Exemplu: Explorarea de noi tehnologii în domeniul semiconductoarelor pentru energie verde va crește gradul de utilizare a acestora în industria automobilelor; se vor dezvolta noi tehnologii curate, în special în domeniul senzorilor pentru aplicații inteligente și al tehnologiilor pentru reciclarea deșeurilor ICT.

vor fi derulate, în colaborare cu producători de echipamente electronice, cercetări privind ecologic al utilizatorilor de ICT;

- se vor lansa pe piața noi produse ICT verzi (de ex. ...);
- administrațiile locale din principalele centre urbane ale României vor beneficia de studii de investiția publică în clădirile verzi;
- se vor dezvolta standarde de achiziție de echipamente ICT verzi pentru administrația locală

2.3. Resurse și rezultate

În această secțiune, va rugăm să estimați, pe baza opiniei dvs. de expert, resursele actuale, resursele necesare și rezultatele anticipate în urma implementării subdomeniului propus.

Resursele și rezultatele trebuie să fie adecvate în raport cu anvergura subdomeniului, dar și cu potențialul real de cercetare românească pentru intervalul 2014-2020.

numarul de cercetatori disponibili în momentul de fata pentru subdomeniul propus: Vă rugăm alegeți...

numarul de cercetatori necesari pentru succesul subdomeniului propus la orizontul 2020: Vă rugăm alegeți...

fondurile necesare pentru succesul subdomeniului propus, pentru intervalul 2014-2020: Vă rugăm alegeți...

principalele tipuri de rezultate anticipate în urma prioritizării subdomeniului propus, până în 2020 (alegeți una sau mai multe opțiuni și estimați o valoare numerică):

	publicații științifice	brevete	infintarea de firme inovative noi	vanzari de produse dezvoltate (Euro)
Expert 1				
Expert 2				
Expert 3				
Expert 4				
Expert 5				
Expert 6				
Expert 7				
Expert 8				
Expert 9				
Expert 10				

3. Va rugăm să recomandați în tabelul de mai jos experți care, în opinia dumneavoastră, pot aduce o contribuție semnificativă la procesul de explorare a domeniului strategic candidat selectat anterior și a subdomeniului propus.

Va invităm să recomandați specialiști atât din instituția dumneavoastră, cât și din alte instituții. De asemenea, va rugăm să recomandați, pe cât posibil, experți din mai multe medii de activitate: universități, institute de cercetare, organizații de consultanță, firme, asociații profesionale și organisme decizionale relevante.

	Nume	Prenume	Email	Instituție	Competența specifică relevantă
Expert 1					
Expert 2					
Expert 3					
Expert 4					
Expert 5					
Expert 6					
Expert 7					
Expert 8					
Expert 9					
Expert 10					

28000+ persons invited

1500+ responses

2000 new persons have been nominated
As relevant

•Exploration and discovery

Extended online
consultation, Aug-Sept 2013



- An R&I program fiche (ICT/Big Data) in the online real-time Delphi consultations.

Criteriul 5. Economia relevanta pe plan national 5th criterion: capacity of the national economy to absorb the results of the R&I program

In ce masura considerati ca exista, la nivel national, un **potential real de absorbtie si valorificare economica a rezultatelor cercetarii** din subdomeniul propus?

Mai jos gasiti o serie de afirmatii prin care alti experti si-au sustinut raspunsul la intrebarea din partea stanga.

Va rugam sa justificati raspunsul dvs. selectand cel mult 3 afirmatii dintre cele de mai jos si/sau introducand o afirmatie noua.

Nota: Cifra din paranteza care apare dupa fiecare afirmatie indica numarul de experti participanti la consultare care au selectat deja afirmatia respectiva

Va rugam evaluati

Quantitative estimate of the economic potential of the R&I program.

Telefonia mobilă, rețelele sociale, tranzacțiile online, activitățile de marketing și promovare, rețelele de senzori, industria de petrol și gaze, energetica (smart grid), etc. au o dinamica pozitivă, ceea ce generează un potențial uriaș de dezvoltare și valorificare a beneficiilor Big Data. (121)

Sectorul asigurărilor publice de sanatate din Romania, odata cu implementarea dosarului electronic al pacientului (proiect in curs de implementare), poate aplica conceptele Big Data pentru optimizarea cheltuielilor, politici proactive de prevenire a maladiilor, monitorizarea de la distanta a pacientilor, etc. In linie cu activitatile similare mentionate pe plan mondial. (86) **Backing up the estimate with pro/con arguments.**

Monitorizarea proceselor si fenomenelor cu impact economic si social (proces de fabricatie, procese de poluare a mediului, retele hidrografice, evolutia stari ide sanatate a pacientilor, trafic de transport auto sau aerian etc.) beneficiaza de capabilitatile de filtrare, stocare si analiza oferite de Big Data. (75)

Serviciile si (open) datele din domeniul public (e-administrare, e-guvernare etc) (31)

Securitatea cibernetica reprezintă o preocupare prioritara la nivelul statului si metodele moderne bazate pe Big Data încep sa fie considerate ca soluții viabile pentru implementare. (24)

doar in zona solutiilor autohtone de securizare a datelor. Banuiesc ca orice privind Big Data va fi de import. Povestile Cloud/HPC sunt la alt domeniu, nu aici. (13)

marile aplicatii ce trebuie implementate in viitor opereaza eficient numai in conditii de maxima securitate a bazelor foarte mari de date, costurile trebuind controlate strict. (6)

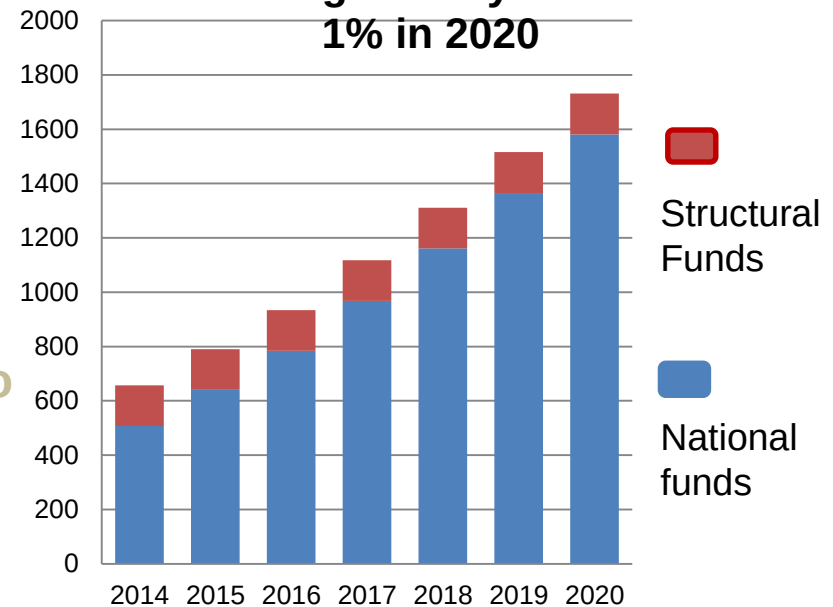
Critical mass

Rank	Micro-vision	Required investment for reaching critical mass
1		
2		
3		
90		

5 billion Euro

24 billion Euro

**Precondition: public R&D
increase gradually and reach
1% in 2020**





Smart specialisations identified in the foresight exercise include:

A1. BIOECONOMY

- Safe, accessible, nutritionally optimized food
- Sustainable development in forestry
- Zootechnics, veterinary medicine, fishing and aquaculture
- New products, practices, processes and technologies in horticulture
- Sustainable development of fields crops
- Bioenergy – biogas, biomass, biofuels
- Biotechnologies for agro-food
- Nanobiotechnology
- Environmental biotechnologies
- Industrial biotechnologies
- Bioanalysis
- Medical and pharmaceutical biotechnologies
- In vitro/ in vivo assessment for generic drugs
- Systemic, local and targeted drug delivery and technologies to optimize the biopharmaceutical and pharmacokinetic profile
- Molecular design, (bio)synthesis, semisynthesis, high-performance screening

A2. ICT

- Analysis, management and security of big data
- Future internet
- Software development technologies, instruments, and methods
- High performance computing and new computational models

A3. ENERGY AND ENVIRONMENT

- Increasing end-use energy efficiency
- Optimizing the use of conventional and non-conventional water resources
- Substitution of critical materials and functional covering
- The intelligent city

A4. ECO-TECHNOLOGIES

- New-generation vehicles and ecological and energy-efficient technologies
- Innovative technologies, equipment and technical systems for the generation of bioresources
- Depolluting and waste reuse technologies

In addition to the four smart specialisations, the foresight exercise identified three national priorities: **Health, Space and Security**, and **Heritage and cultural identity**.

•RIS3 Priorities

Process: <http://www.poscce.research.ro/ro/node/node/nid/2438>



- Project ➡ version Dec. 2013

Smart specialization fields

- Bioeconomy
- ICT
- Energy & Environment
- Eco-technologies

Public interest priorities

- Health
- Security & Space
- National heritage & identity, cohesion and cross-cultural linkages

- Public debate (mandatory according to the law of transparency) ➡ version Apr. 2014

Smart specialization fields

- Bioeconomy
- ICT, Security & Space
- Energy, Environment & Climate changes
- Eco-nano-technologies & Advanced Materials

Public interest priorities

- Health
- National heritage & identity
- Emerging technologies

- Feedback from relevant stakeholders and political decision ➡ version July (?) 2014

•RIS3 Priorities



Focus on changes related to [Smart Specialization](#) so far

Micro-vision fiches after refining (see the Annex for the full process): [Agro-food](#);

[Bio-technology](#); [Energy](#); [ICT](#); [Materials](#); [Environment](#); [Health](#); [Security](#); [Intelligent Systems](#); [Socio-economics](#); [Space](#); [Medicine Science](#); [Transport](#)

ICT $\longrightarrow$ ICT, [Security & Space](#)

Rationale: ICT prioritized for [information security & space security](#) because of new info regarding the sectoral strategies (not available at the time of the first version); RO is external border of UE.

Energy & Environment $\longrightarrow$ Energy, Environment & [Climate change](#)

Rationale: Environment focus on Climate Change; the *Danubius* Center will be operational by 2018.

Eco-technologies $\longrightarrow$ Eco-[nano-technologies](#) & [Advanced Materials](#)

Rationale: specific request of Renault Romania Group, the Romanian Academy, and of several elite National institutes – given the opportunities in the automotive industry, textiles, and KET development (subject to further debate).

•Looking beyond the boundaries



•The smart specialization-aware National RDI Strategy has taken into account the external context in the following ways:

- Through comparative analyses of relative specialization in research and development sectors in Europe.
- One of the key inputs in the work of panels fleshing out the shortlisted smart specialization fields were analyses of global drivers of change.
- Global relevance was among the explicit criteria for panels selecting and describing the most promising R&I programs.

- Strategy supports measures for international openness of Romanian research market. External knowledge should be used to improve level of R&I by supporting the participation of high level international researchers as project directors in host institutions in Romania (enterprises or research institutes or universities)

•Global Value Chain analysis

The panels working on candidate smart specialization fields followed a set of criteria in choosing the most promising R&I programs.

Key among these were criteria related to the current state of the envisaged economic subsector, the economic impact of the program, existing R&D-business collaborations etc.

•A brief overview of transnational/transregional cooperation activities



- As far as transnational/transregional collaboration on RDI is concerned, Romania sees itself as a hub in such projects as ELI-NP and the Danube Institute. [Is this supposed to be about the past, the present, the future?]
- As far as RDI is concerned, Romania participates in 6 JPIs (“Healthy and Productive Seas and Oceans”, “Cultural Heritage”, “Agriculture, Food Security and Climate Change”, “A Healthy Diet for a Healthy Life”, “Antimicrobial Resistance”, “Water Challenges for a Changing World”) and 5 JTIs (“Clean Sky”, ENIAC, “Fuel Cells”, ARTEMIS, IMI).
- Other transnational programs: the Danube Innovation Partnership (launched at the end of 2013); the Switzerland-Romania Cooperation Programme, 2011-2016; the Romania-Norway, Iceland, Liechtenstein Cooperation Programme, under the SEE Financial Mechanism 2009-2014; the Romania-France framework for research collaboration (joint research in Physics, Environment, Chemistry, Mathematics). Also, ERA.Nets (such as ERA.Net RUS).
- What are advantages and disadvantages of collaboration? Can you describe bottlenecks/obstacles in collaboration? [The advantages and disadvantages in general / in specific cases? The obstacles encountered in specific circumstances / contemplated for the future?]



•Entrepreneurial dynamics

•Assessing entrepreneurial dynamics in Romania:

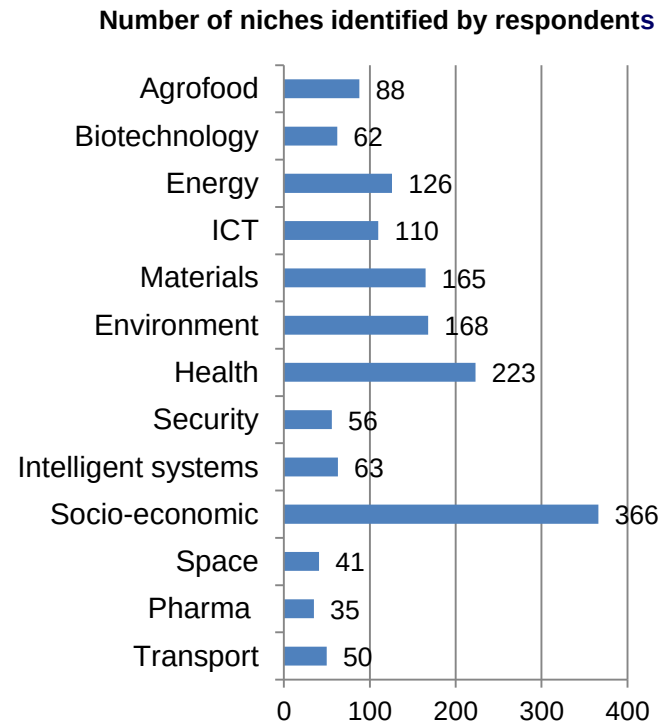
–Smart specialization was conceived of as a process of gradual learning, iterative and dynamic, involving constant gathering and analysis of data at local and national level.

–Given the RDI-focus of the Strategy, the latter focused primarily on *enabling innovation-driven entrepreneurship* (e.g., through fiscal and financial mechanisms, support for firm-initiated RDI projects). The *response of the private sector will be a key form of feedback* in re-defining and re-designing smart specialization priorities.

–A related goal – to *catalyse entrepreneurial behaviour in the public sector*, through programs aimed at increasing the public sector's capacity to formulate its innovation needs (incl. monitoring of emergent technologies); public procurement of innovative products and services; pre-commercial public procurement.

•Involvement of entrepreneurial actors:

First online consultation



13 panels elaborated 90 microvisions/fiches

Second online consultation

- 44,000+ invited
- 4,091 respondents
- Average of 161 respondents per fiche

•Governance of RDI strategy



•National level

- The smart specialization-aware RDI strategy design process was outsourced by the Ministry of National Education to a consortium of 11 partners and 142 supporting organizations in R&D&I.
- The consortium involved policy-makers, a variety of types of research institutes (including private ones), universities, strong business innovators, regional development agencies, and even a few business angels.
- Actors were identified through ‘knowledge maps’ (social network analyses of the Romanian RDI ecosystem based on data collected from projects, publications, patents); the list was further extended through nomination and co-nomination.
- Although there was no official interministerial collaboration in designing the strategy, informal discussions were held with teams in the Ministry of the Economy.
- The design of the strategy involved a number of collaborative procedures, from work in relatively large and diverse panels to participative online consultations.
- At key junctures, proposals were debated with an extended group of key actors.
- The project team was counselled by a High-Level Expert Group, which also provided oversight of the project.

•Digital Growth Priorities

- National level
- Romania has a distinct strategy for digital growth.
- In the context of this RDI Strategy, ICT was identified as a smart specialisation field.



•KET-related Priorities



Several smart specialization fields and R&I programs include/assume KETs – Biotech, ICT (Big data, future internet etc.), Advanced and nano-materials

The R&I program fiches in the smart specializations fields provide – where pertinent – arguments pro / against the relevant KETs.

Arguments for KETs were also provided in the consultations on the Strategy package – from Renault Group, the Romanian Academy, National R&D Institutes IFIN-HH, INFLPR, Materials Phys. and Micro-technology. The proposals considered included the following:

- The proposals made in the panels working on the draft strategy (July 2013);
- The proposals advanced during the consultations with SMEs on the RDI Strategy document, the implementation plan and the Competitiveness sectoral program (December 2013);
- Results of the NANOPROSPECT prospective study (2010-2011), available at www.imt.ro/NANOPROSPECT;
- The “Clara” cluster initiative;
- The conclusions of the *Innovation Union Competitiveness Report*, 2013, which states:

"In terms of technological capability Romania has the potential for regional clusters in ICT, nano-sciences and nanotechnologies, automotive, security and new production technologies".

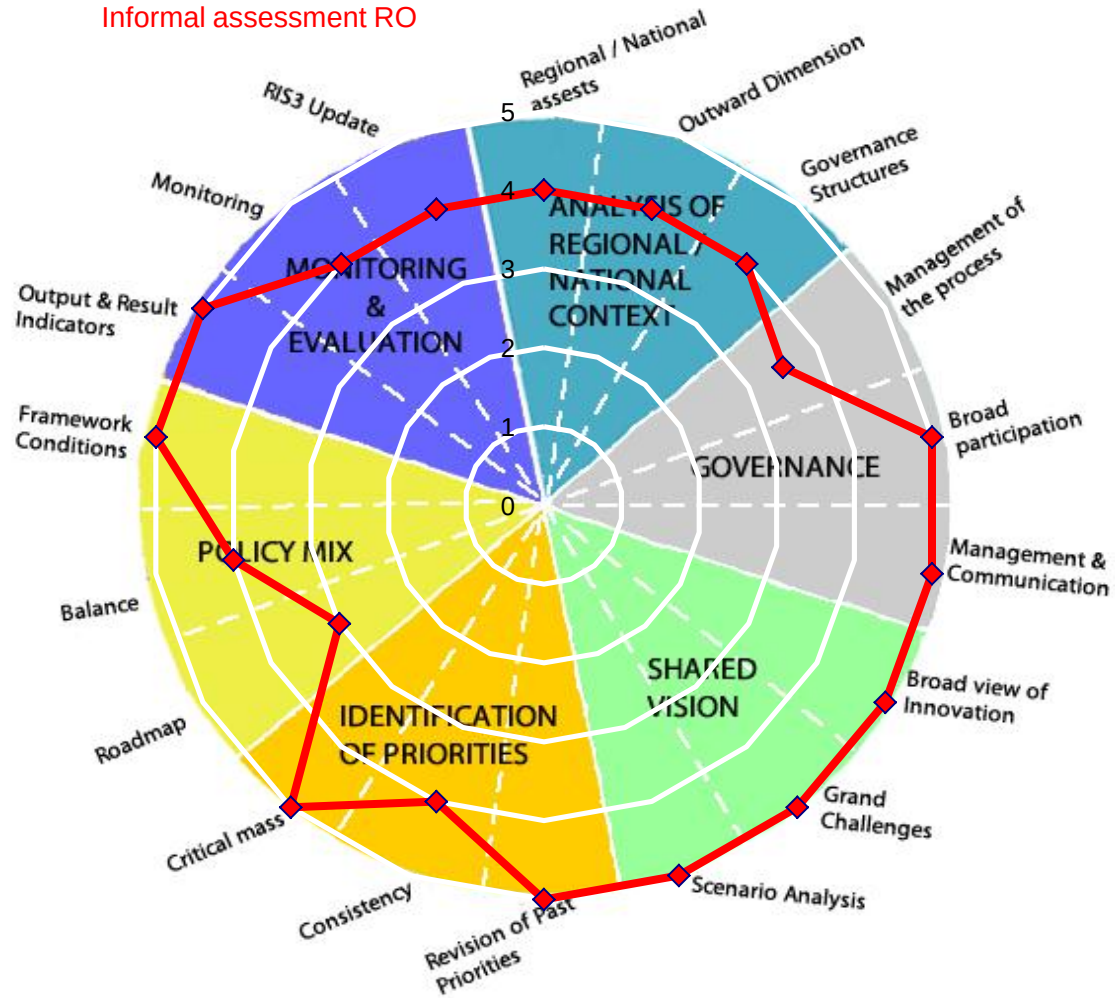
•Measuring the progress



	Last value (year)	Target 2017	Target 2020
Premises			
Public expenditures for research and development, as a share of GDP	0.31 (2011)	0.61	1.0
Number of doctorate graduates (ISCED 6) per 1000 inhabitants, 25-34 y.o.	1.4	1.5	1.5
Number of researchers in the public sector (full-time equivalent)	12409 (2011)	15000	17000
Scientific publications in the top 10% of the most quoted publications worldwide, as % of the total scientific publications in the country	3.8 (2011)	5	7
International scientific co-publications for 1 mil. inhabitants	148	200	300
Venture capital as % of GDP	0.033	0.06	0.09
Spill-over in the private sector			
Research and development spending of the business sector as a share of GDP	0.17 (2011)	0.6	1.0
Number of researchers in the private sector (full-time equivalent)	3518 (2011)	7000	14500
Public-private co-publication for 1 mil. Inhabitants	8.3	12	16
Innovative SMEs cooperating with others (%)	2.93	3.5	6
EPO patent applications / year	40	80	120
USTPO patent applications / year	17	30	60
Community trade mark applications / EUR 1 billion GDP adjusted to the purchasing power parity	2.14	3	4
Economic impact			
Innovative companies with rapid growth	-	50	150
SMEs introducing innovative products and services (%)	13.7 (2011)	16	20
Revenue from licences and patents from abroad as % of GDP	0.13 (2011)	0.15	0.17

Driving economic change through smart specialisation/RIS3

Informal assessment RO



A word cloud for the RIS3 2014 Dublin Workshop. The words are arranged in a circular pattern, with 'RIS3' and '2014' being the largest. Other prominent words include 'Dublin', 'Workshop', 'Engagement', 'Stakeholders', 'Outward Looking', 'Governance', 'Smart Specialisation', 'S3 Platform', 'Peer Review', 'National', 'RIS3', '2014', 'Dublin', 'Workshop', 'Engagement', 'Stakeholders', 'Outward Looking', 'Governance', 'Smart Specialisation', 'S3 Platform', 'Peer Review', 'National'.

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Annex – procedure description



Assistance to identifying national priorities as regards the Smart Specialisation in the next national strategy for research and innovation 2014-2020

- Jaspers Report (<http://www.poscce.research.ro/uploads/programare-2014-2020/final-report-12-aprilie.pdf>)
- Recommendations report (<http://www.poscce.research.ro/uploads/programare-2014-2020/jaspersrecommendations.pdf>)
- Maps of knowledge (<http://www.cdi2020.ro/pachete-de-lucru/panel-prioritati/>)

Foresight

- Expert pannels (<http://www.cdi2020.ro/wp-content/uploads/2013/09/Componenta-paneluri-prioritati.pdf>)
- Methodology (<http://www.cdi2020.ro/pachete-de-lucru/panel-prioritati/>)
- “Online” questionnaire (<http://www.cdi2020.ro/wp-content/uploads/2014/02/Raportul-chestionarului-identificare-expertilor-si-prioritatilor-candidate.pdf>)
- Refining (fiches on: [Agro-food](#); [Bio-technology](#); [Energy](#); [ICT](#); [Materials](#); [Environment](#); [Health](#); [Security](#); [Intelligent Systems](#); [Socio-economics](#); [Space](#); [Medicine Science](#); [Transport](#))
- Prioritization and version Dec. 2013.

Public debate

- National R&D institutes
- Romanian Academy
- Private companies
- Changes as for version Apr. 2014.



Feedback & political decision

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- Version July 2014