

Regional Innovation Impact Assessment Framework for universities: design and development of an evidence-based model

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Performance based funding of universities



JRC SCIENCE FOR POLICY REPORT

Research Performance Based
Funding Systems: a Comparative
Assessment

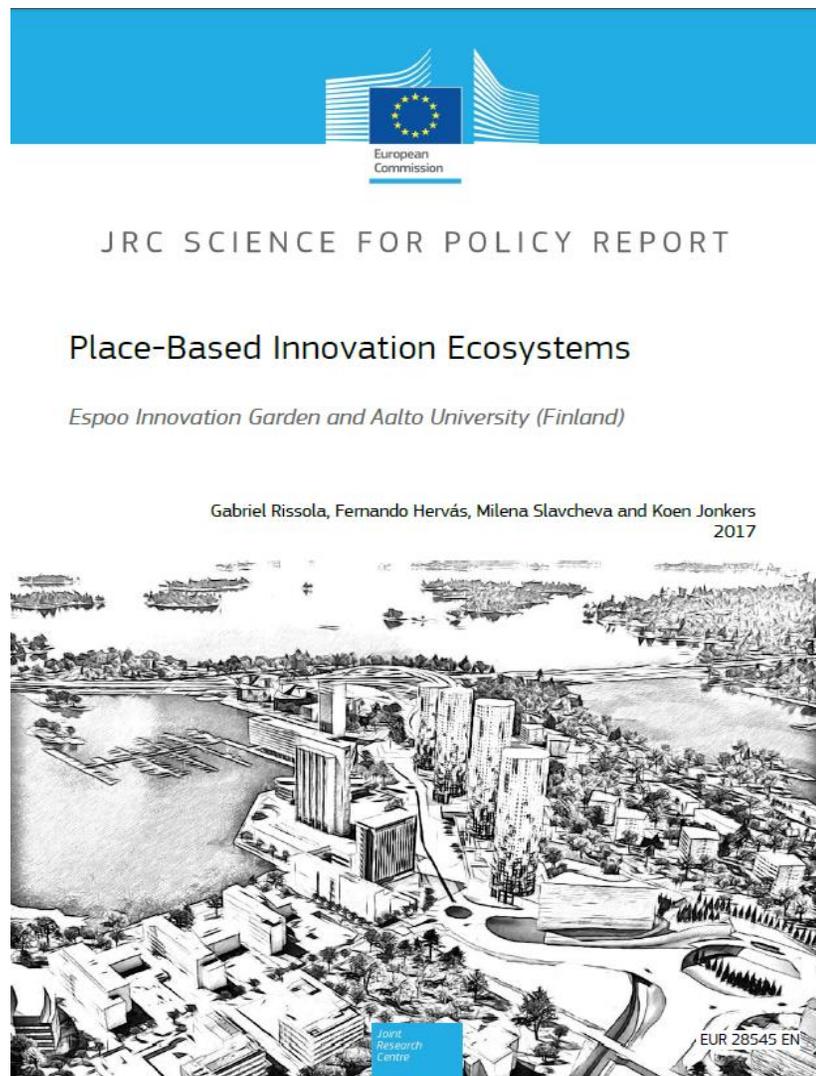
Koen Jonkers & Thomas Zacharewicz

2016



- Based on a comparative qualitative analysis of 35 national R&I systems.
- Fed into the H2020 PSF MLE on PBF

Aalto University: case study



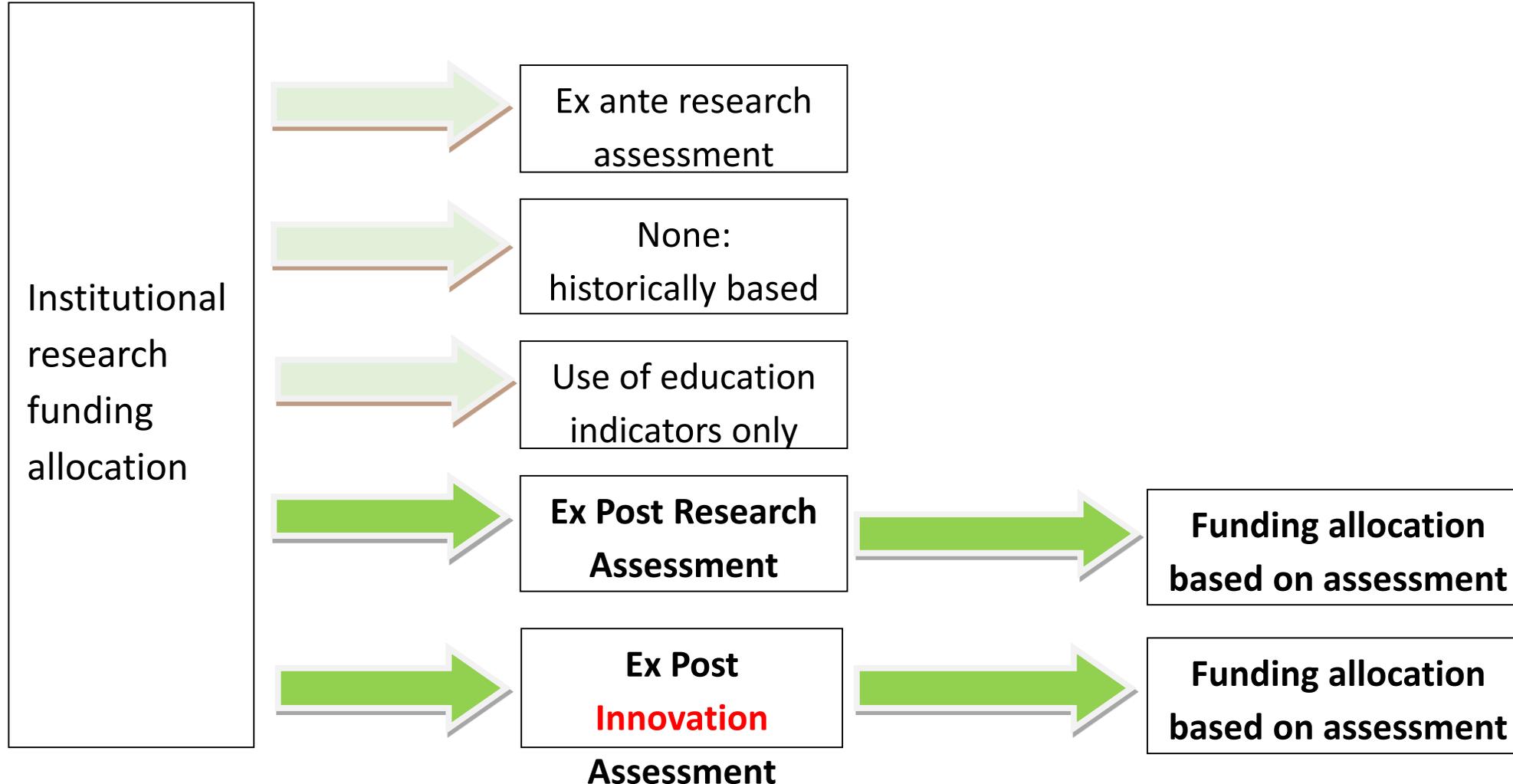
Success story of an entrepreneurial university orchestrating its innovation ecosystem

Lamy Report: European university label

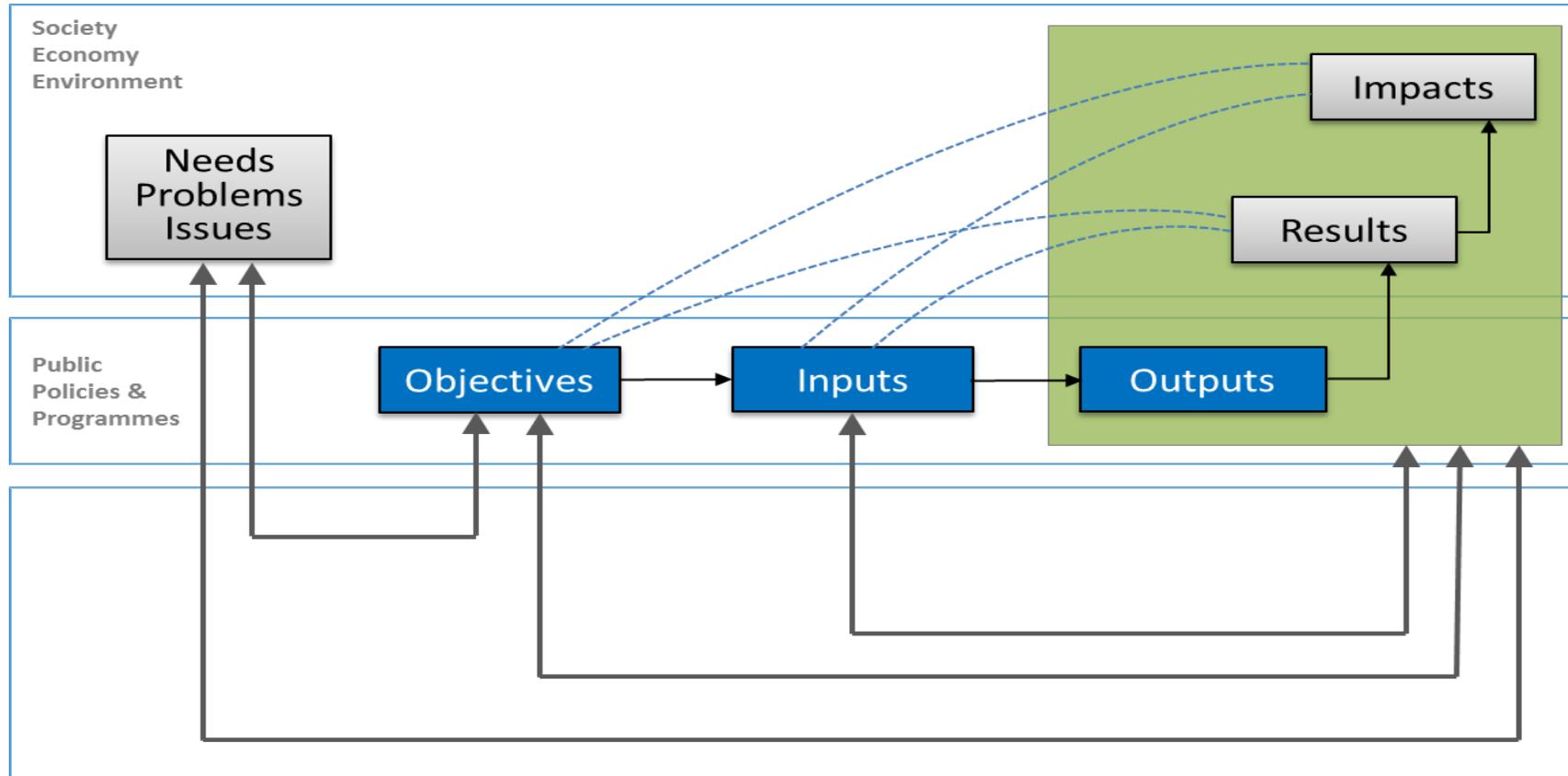


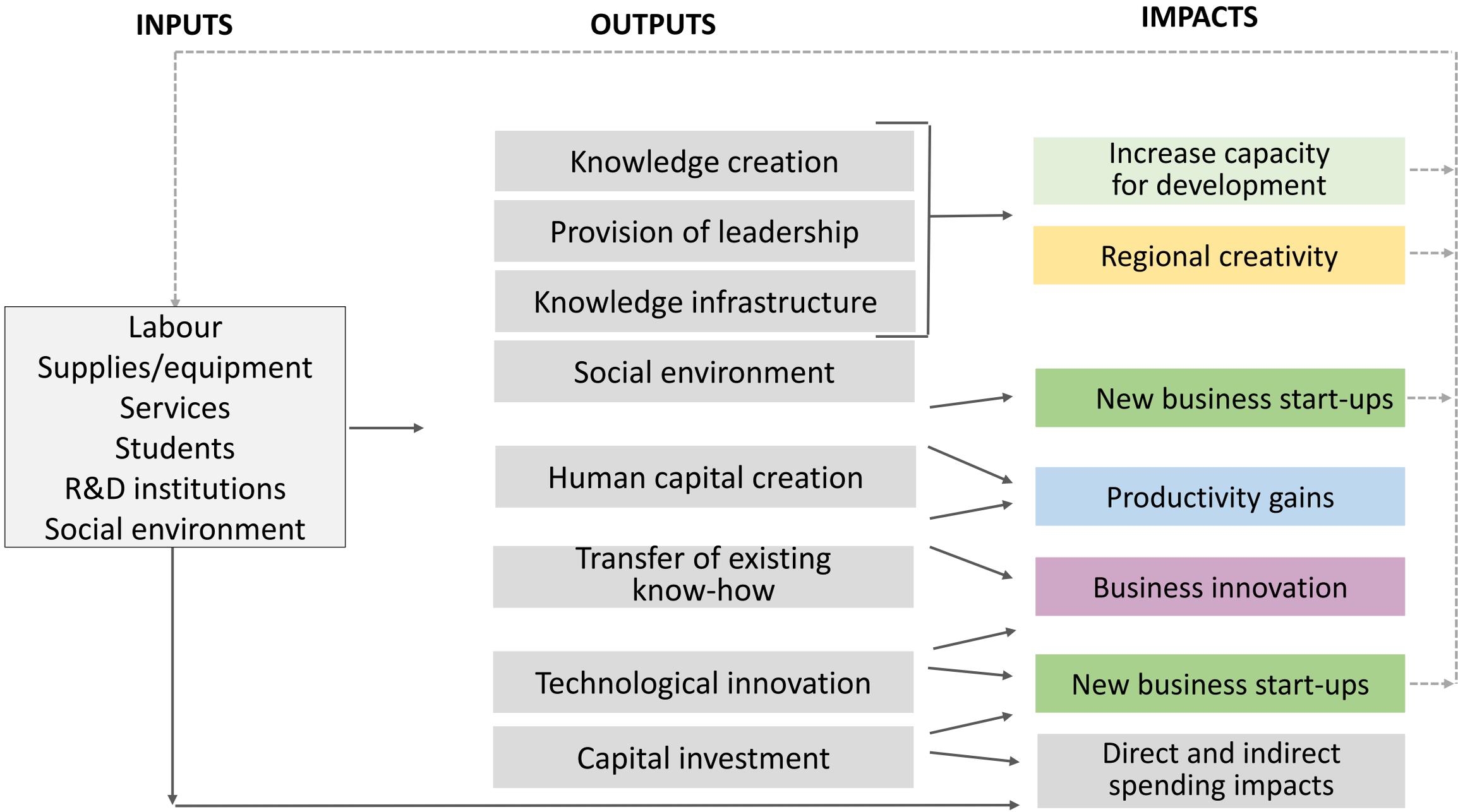
The EU could offer top-up institutional funding tied to modernization and innovation performance (Lamy et al, 2017)

Performance based funding of universities



Innovation Impact of Universities

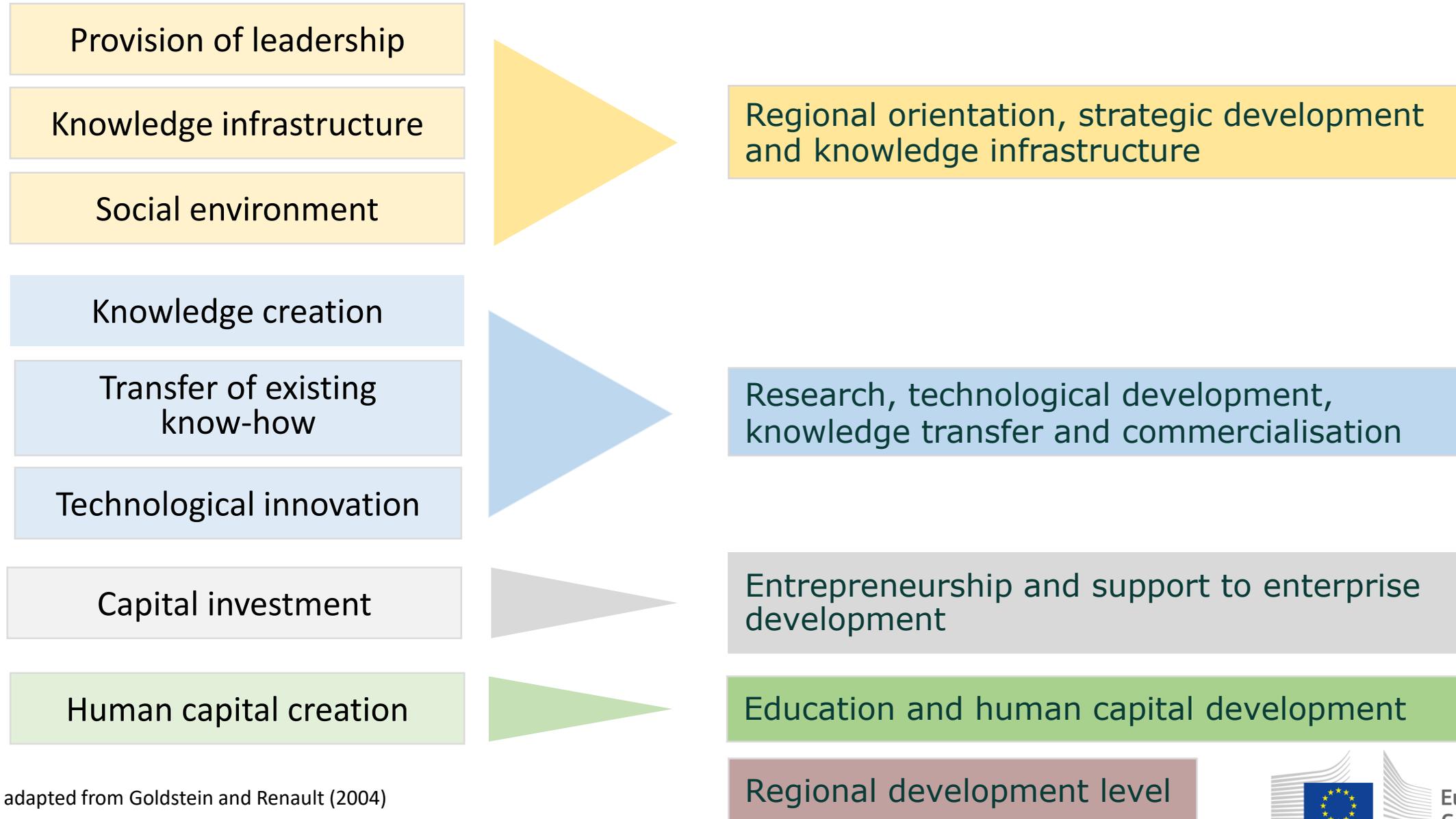




Source: adapted from Goldstein and Renault (2004)

OUTPUTS/IMPACTS

Indicator portfolio



Source: adapted from Goldstein and Renault (2004)

OUTPUTS/IMPACTS

Indicator portfolio

Provision of leadership

Knowledge infrastructure

Social environment

Regional orientation, strategic development and knowledge infrastructure

Tailor made RIA profile could feed into a university level case study: a "narrative with numbers"

Capital investment

Human capital creation

Entrepreneurship and support to enterprise development

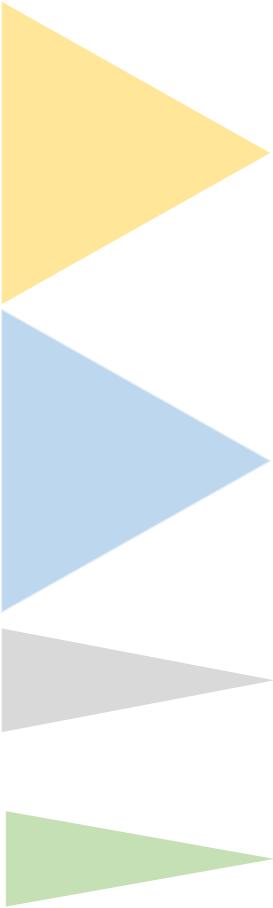
Education and human capital development

Regional development level

Source: adapted from Goldstein and Renault (2004)

Indicator boxes

University performance



Regional orientation, strategic development and knowledge infrastructure

examples

Profiling related to regional needs and specialisation

Research, technological development, knowledge transfer and commercialisation

R&D related income from private sector

Entrepreneurship and support to enterprise development

Student start ups / spin offs

Education and human capital development

% of students enrolled in entrepreneurship courses

context

Regional development level

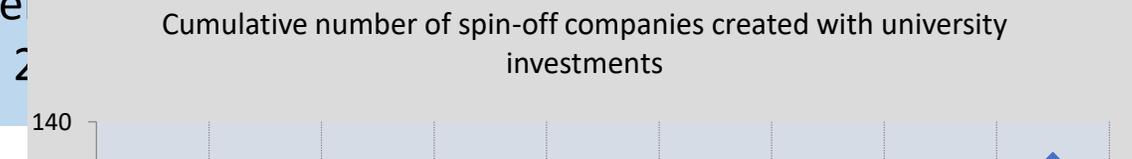
e.g. Regional Innovation Scoreboard

Case studies (1)

"The university generated 25% of the funding of its R&D through contracts with firms in 2010-2015 – up from 15% in 2005-2010"

"University Alpha's technology transfer office

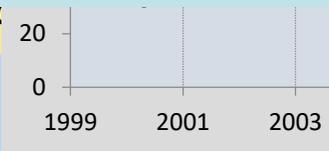
had a total turnover of €240 million euros in



"University Alpha led the development of the Alpha by government designing

Vision & Strategy: The university's most recent 'Strategic Plan 2016-2020' states: "... aims to become a global innovation leader by 2020, delivering world class solutions and providing a greater contribution to the economic growth of its region".

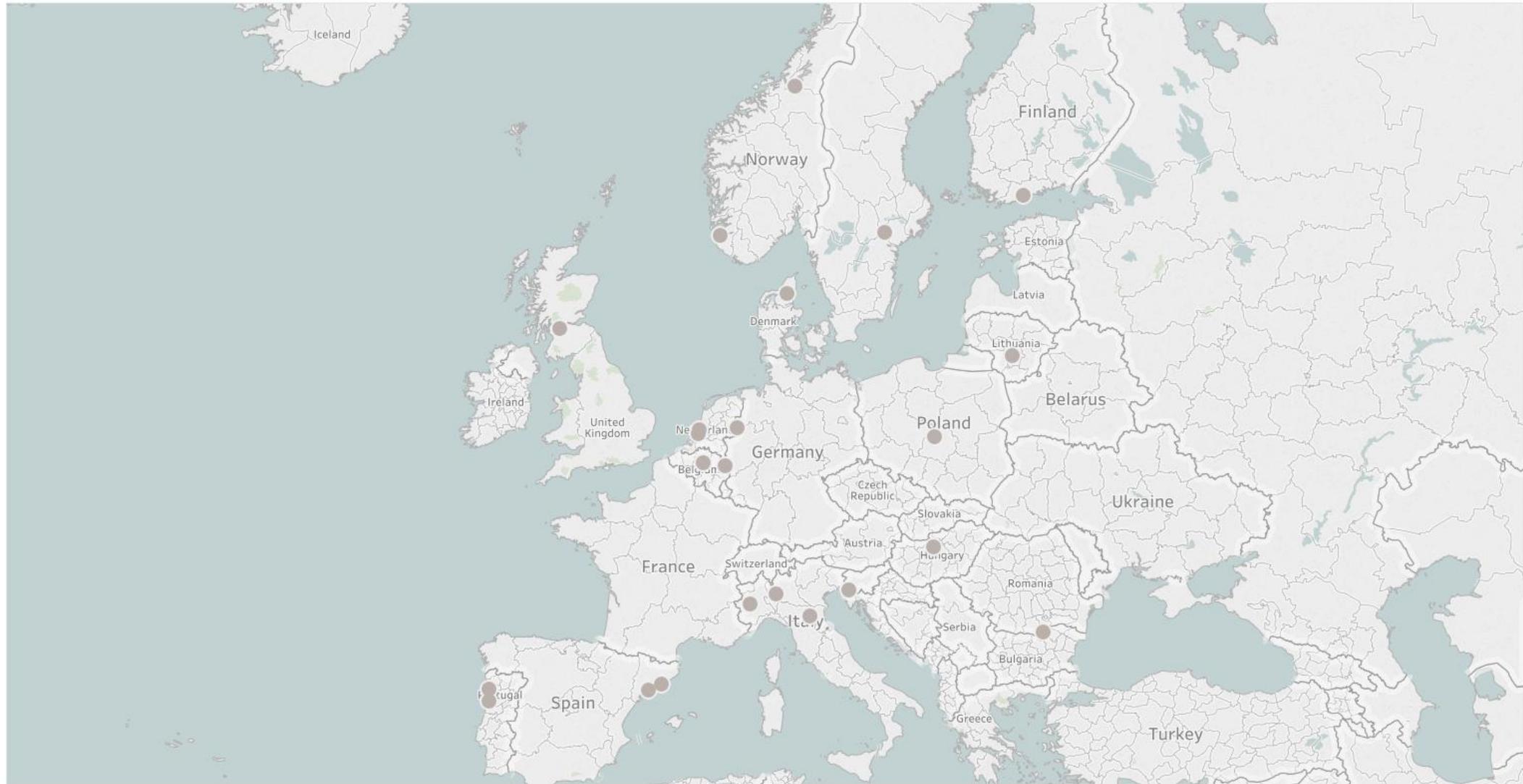
Transferred technology for innovation and growth
Research in the Department of Engineering, made it possible to design a 3D compressor blade as a single component. Blades designed using the research results yielded fuel efficiency improvements of about 1% when deployed in aircraft engines manufactured by a worldwide known company. The efficiency improvements in the engine delivered significant savings in CO₂ emissions and in fuel costs. The demand for this new technology engines increased in recent years. The orders the company received during the assessment period are estimated to be worth more than 20 billion Euros at list prices.



"In the period 2010-2015, University Alpha trained 40 industrial PhDs - 10 % of all graduated PhDs "

of specific occurrences

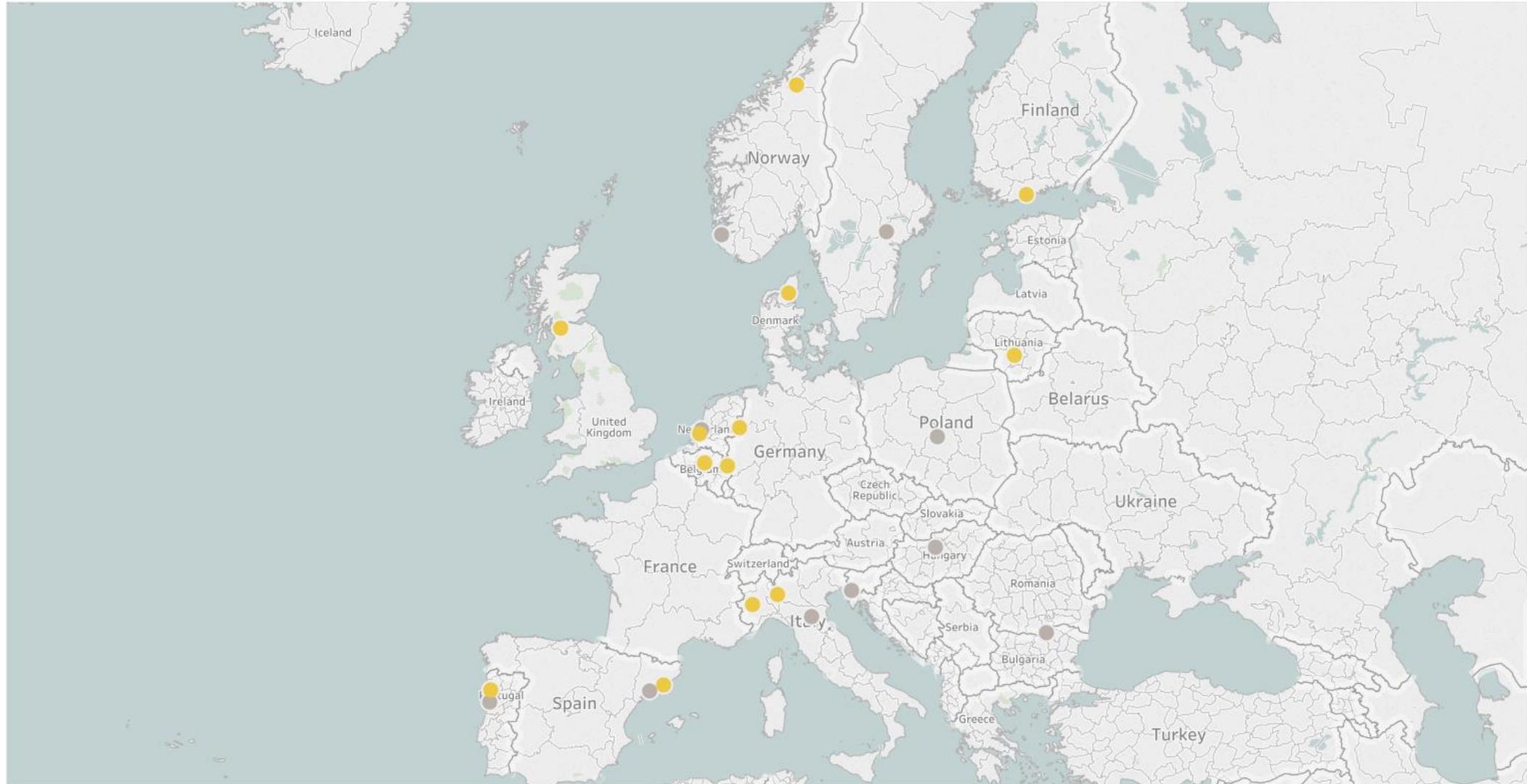
JRC case studies



Map based on average of lon and average of lat. Color shows details about Category JRC study. Details are shown for country, City and University. The view is filtered on Category JRC study, which keeps JRC case study.



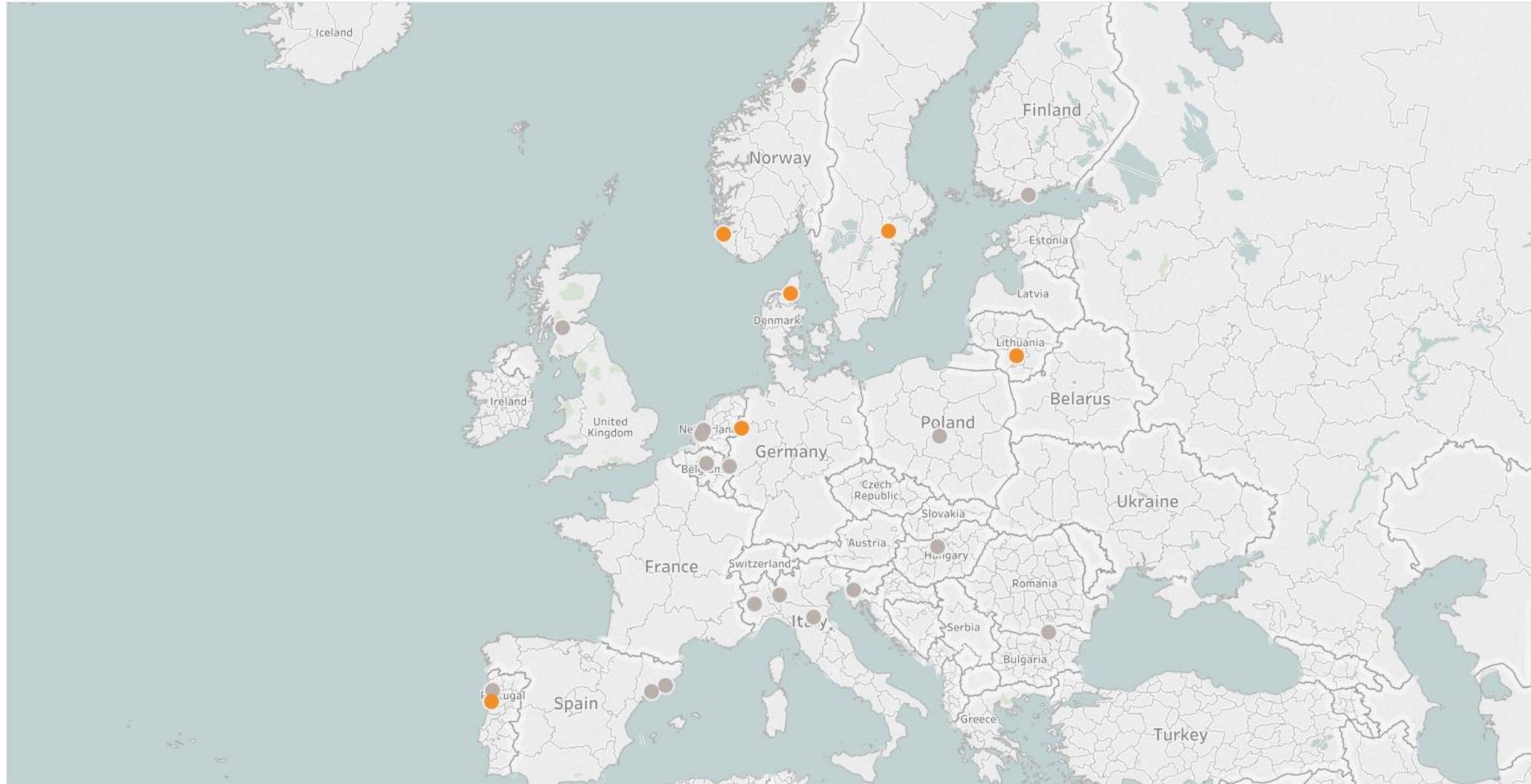
JRC case study and CESAER universities



Map based on average of lon and average of lat. Color shows details about Category CESAER. Details are shown for country, City and University. The view is filtered on Category CESAER, which keeps CESAER member in JRC case study and JRC case study.



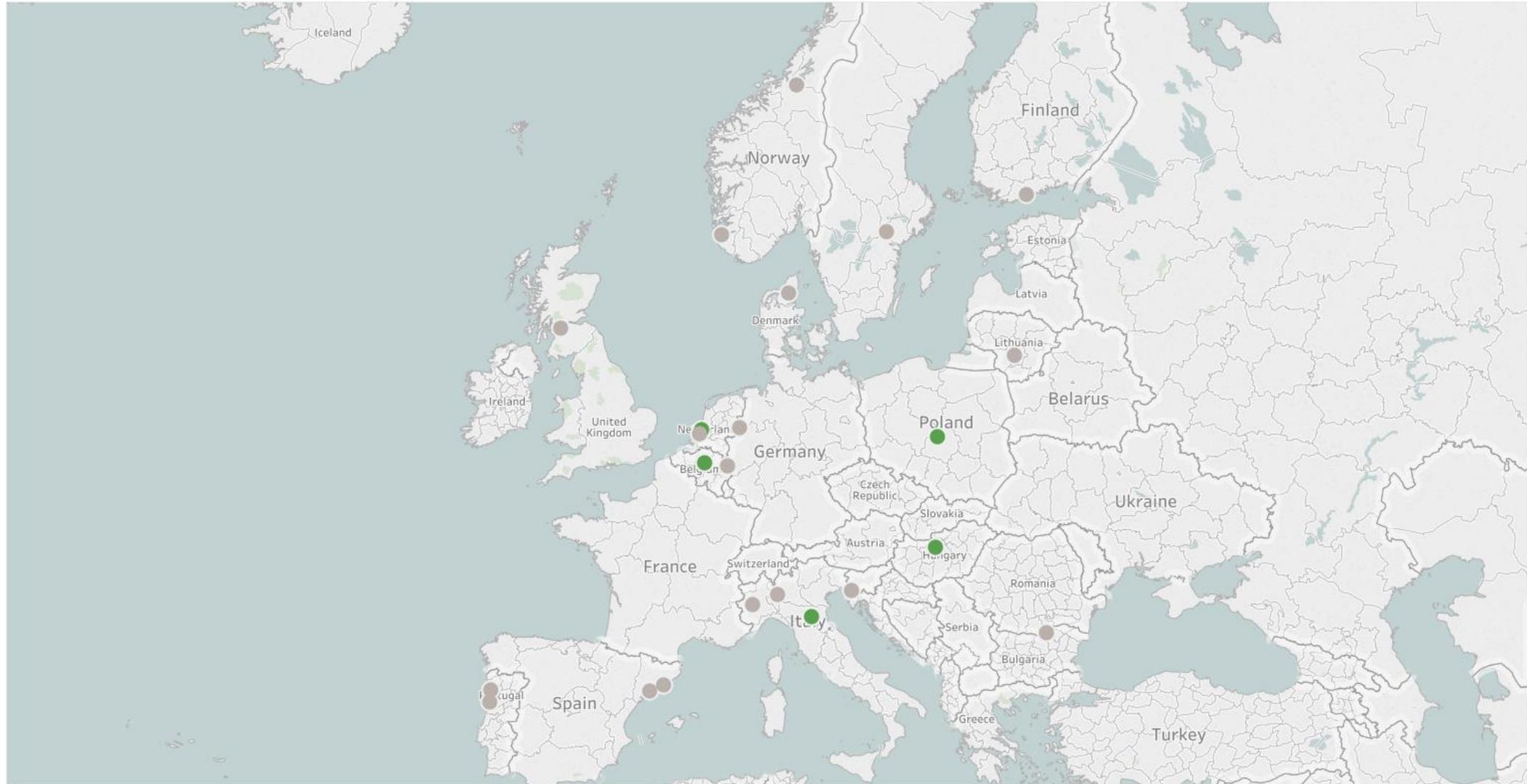
JRC case study and ECIU universities



Map based on average of lon and average of lat. Color shows details about Category ECIU as an attribute. Details are shown for country, City and University. The data is filtered on Category ECIU, which excludes dng.



JRC case study and comprehensive research universities



Map based on average of lon and average of lat. Color shows details about Category GREEN. Details are shown for country, City and University. The view is filtered on Category GREEN, which keeps JRC case study and legend label to be defined.



Human Capital and Entrepreneurship Education

"Universities including Aalborg, Aalto and KU Leuven integrate entrepreneurship education throughout their curricula by making students work in teams on real life projects in active collaboration with companies"

"Universities throughout Europe engage with regional employers to enhance the employability of graduates"

Regional leadership, strategic development and knowledge infrastructure

"Universities, including Rovira I Virgili and Ruse Universities play an active role in helping their regions or subregions develop Smart Specialisation strategies"

"Innovative Universities, such as Aalborg, have been very successful in making their less developed regions more dynamic and attractive to R&D related Foreign Direct Investment"

Research, technological development, knowledge transfer and commercialisation

Bologna, ELTE and Leiden University show that also non-technical, comprehensive universities can be successful in setting up formal knowledge transfer infrastructures

Aalto University argues "that in an integrated co-creation model the focus should be on the achievements of the ecosystem as a whole", " by not focussing on maximising its own technology transfer indicator values Aalto University facilitates the success of the other ecosystem members".



Thanks

Questions and inputs/feedback?

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Indicator Box A: Education and human capital development

Inputs	'Results' indicators and 'Impact' indicators
<ul style="list-style-type: none">• Grants and scholarships for students from local/regional private sector• Credit bearing courses established through a direct request or with the involvement from non-academic local/regional organisations;• Tailor-made academic programs in partnership with businesses• Participation non-academic agents in curricula design• Joint PhD Programmes and industry sponsorship of post graduate education• Entrepreneurship teaching and learning; skills development• Inter-sectorial mobility of teaching staff• Labour outcomes and student satisfaction post-graduation• Regional student retention• Life-long learning and non-academic education• Graduate tracking of salaried employment	<ul style="list-style-type: none">• Entrepreneurship education: number of students enrolled in entrepreneurship courses as % of total students• the number of students attending internship• Number of faculty members taking a temporary position in a non-academic organisations;• Number of employees from non-academic organisations taking temporary teaching and/or research positions at university• Labour outcomes and postgraduate labour surveys that measure satisfaction with knowledge gained at university• Student internships in the local region: out of the students who did an internship, the percentage where the internship was with a company or organisation located in the region• BA theses with local/regional organisations: degree theses of bachelor graduates done in cooperation with organisations (industry, public, non-profit organisations) in the region• MA theses with local/regional organisations: degree theses of master graduates done in cooperation with organisations (industry, public, non-profit organisations) in the region• % academics teaching in courses required by local/regional firms; or income received from non-credit bearing teaching and associated activities for local/regional clients• Graduate employment: percentage of graduates working in the region after graduation• Wages of university graduates (3-5 years after graduation)

Box B: Research, technological development, knowledge transfer and commercialisation (with involvement of local or regional partners)

Inputs	'Results' indicators and 'Impact' indicators
<ul style="list-style-type: none">• Research activities• Knowledge and technology transfer• Consultancy and contract research• Collaboration with regional private partners• Inter-sectorial mobility of research/teaching staff• Industry funded research positions• Shared R&D facilities• International staff	<ul style="list-style-type: none">• R&D related income from local/regional private sector• Resources generated from contract research and consultancy work local/regional industry• Strategic research partnerships in the region• Regional partnerships of the Tech Transfer Office• Patent (applied/granted), licensing income from local/regional industry• Regional joint research publications within local/regional industry• Shared R&D facilities with local/regional industry• Mobility of university staff to or from local business enterprises• Research staff with a dual affiliation at local/regional business enterprise• Industrial PhDs that involve local/regional industry; % of PhDs undertaken jointly with private actors or the number of postgraduate students directly sponsored by local/regional industry R&D prizes and innovation prizes awarded by local/regional industry• Professorships or other university positions (partially) funded by local/regional industry• Public private co-publications

Indicator Box C: Entrepreneurship and support to enterprise development (within the local region or with involvement of local or regional partners)

Inputs	'Results' indicators and 'Impact' indicators
<ul style="list-style-type: none">• Industry liaison offices, knowledge and technology transfer offices;• Business incubators, and accelerators• Access to seed funding and venture capital• Science park, technology park or innovation hub• Other business-related infrastructure, facilities and services	<ul style="list-style-type: none">• University spin-off and start-up companies (number of, employment generated, turnover)• Student start-ups (number of, employment generated, turnover, private funding raised, nature of university support)• Investments of industry or public sector partners

Indicator Box D: Regional orientation, strategic development and knowledge infrastructure (with involvement of local, regional, national or foreign partners)

Inputs	'Results' indicators and 'Impact' indicators
<ul style="list-style-type: none">• Profiling to reflect regional specialisation and objectives• Involvement in regional innovation strategy setting• Regional knowledge infrastructure;• Capacity for regional socioeconomic development	<ul style="list-style-type: none">• Income from regional sources: proportion of external research revenues – apart from government or local authority core/recurrent grants – that comes from local/regional sources (i.e. industry, private organisations, charities).• Joint agenda setting with regional partners• Profiling strategies (PR and marketing) related to regional needs and specialisations• HRM and staff performance assessment related to regional needs and specialisations• Formation of social ties and networks with local/regional stakeholders and partners• Contributions to the creation of a local/regional entrepreneurial ecosystem• Contribution to embedding the regional innovation system in international R&D networks (international co-publications; participation in international research projects; attraction of foreign staff)• Contribution to the investment climate (attraction of private investments in the region e.g. by foreign or national firms)

Regional context indicators

Inputs	'Results' indicators and 'Impact' indicators
<ul style="list-style-type: none">• Framework conditions (human resources, attractive research systems, innovation friendly environment)• Investments (finance and support; firm investments)• Innovation activities (innovators, linkages and intellectual assets)• Employment and sales impacts	<ul style="list-style-type: none">• Percentage population aged 30-34 having completed tertiary education• Percentage population aged 25-64 participating in lifelong learning• International scientific co-publications per million population• Scientific publications among the top-10% most cited publications worldwide as percentage of total scientific publications of the country• R&D expenditure in the public sector as percentage of GDP• R&D expenditure in the business sector as percentage of GDP• Non-R&D SME innovation expenditures as percentage of total turnover• SMEs introducing product or process innovations as percentage of SMEs• SMEs introducing marketing or organisational innovations as percentage of SMEs• etc