Entrepreneurship and Innovation

The Role of Universities

Wolfhard Wegscheider

12 December 2013

Outline

- „Definition“
- Innovation: European Problems & Approaches
- Montanuniversitaet Leoben
- The Elements of an Innovation System
  - Boundary Conditions and Mechanisms
  - Specific Implementation and Operation
- European Institute of Technology (EIT) – Knowledge and Information Communities

„Definition“

- *"Innovation is the process of finding economic applications for inventions"*

Joseph A. Schumpeter, 1911 (Austrian)

- *Die Umwandlung von Geld in Wissen ist Forschung, die Umwandlung von Wissen in Geld ist Innovation*
- *The transformation of money to knowledge is research, the transformation of knowledge to money is innovation*
  Thomas Mirow (German)

Main factors hampering innovation
(in Europe)

- lack of access to finance,
- too high costs of innovation and
- lack of incentives facilitating cooperation between actors

To a lesser extent

- innovation efforts of enterprises are considered to be hampered by difficulties in finding partners for innovation and
- lack of knowledge about support instruments

http://ec.europa.eu/enterprise/policies/innovation/files/swd_effectiveness_en.pdf

Europe needs more entrepreneurs

- ***'Majorities in the US, the European Union, and China associate themselves with attitudes often ascribed to entrepreneurs. Americans, however, are more likely than those in the European Union and China to see themselves as risk takers, competitive, and confident they can accomplish difficult tasks.'*** (Gallup World, 2010)

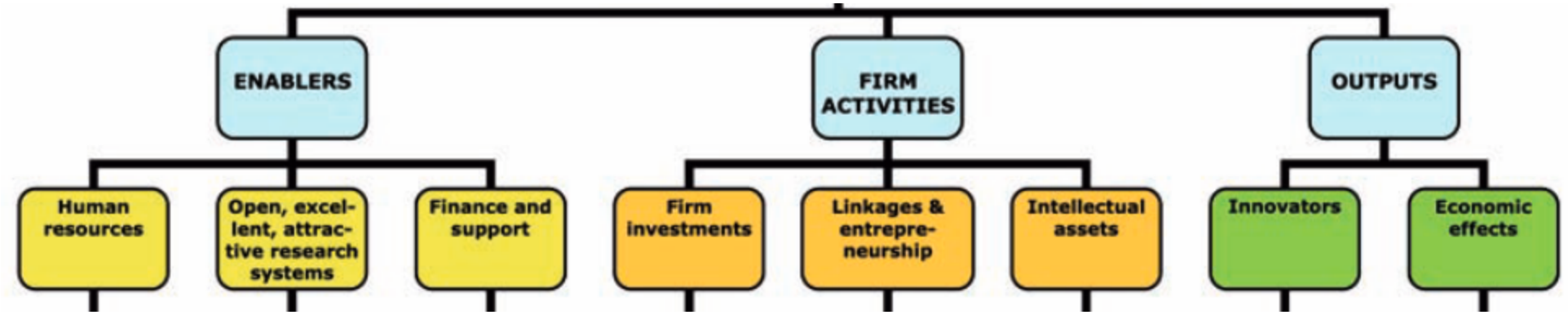
http://eit.europa.eu/entrepreneurship/

Innovation Union Scoreboard 2013

- **Ranks Member States**
  - **by 25 indicators**
  - **clustered in 8 innovation dimensions**
- **Compares performance to major global competitors**

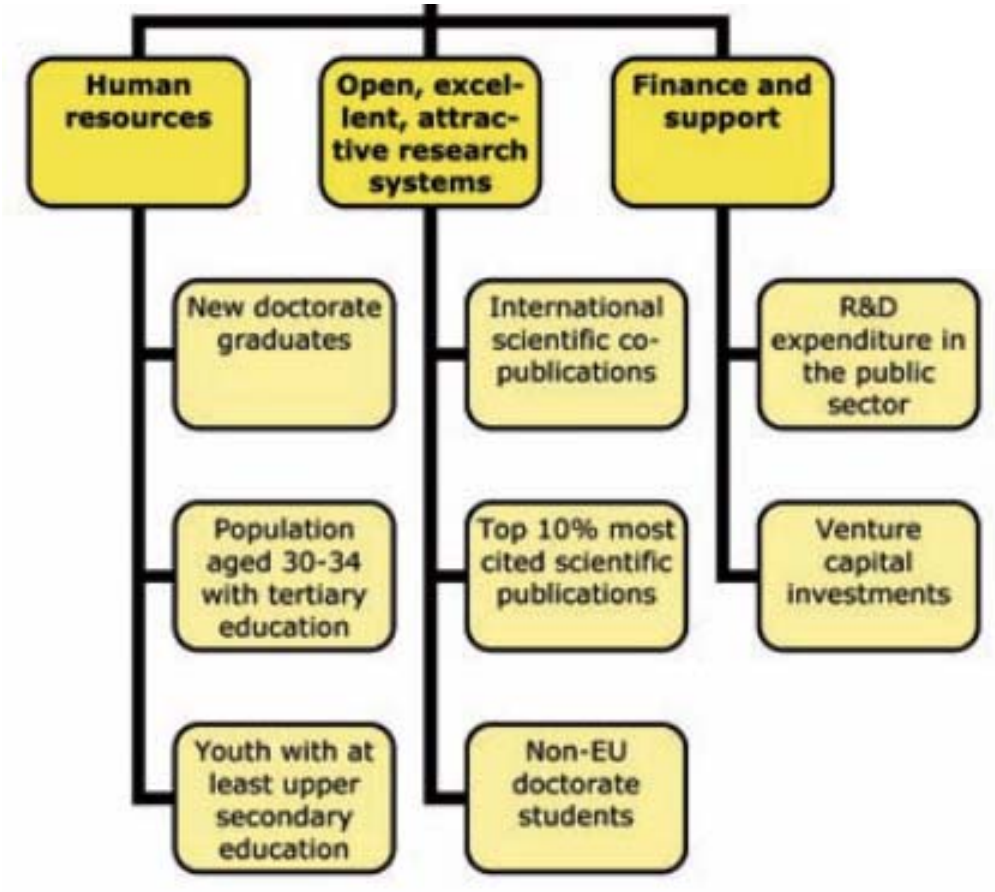
http://ec.europa.eu/enterprise/policies/innovation/files/ius-2013_en.pdf

Eight dimensions, 25 indicators

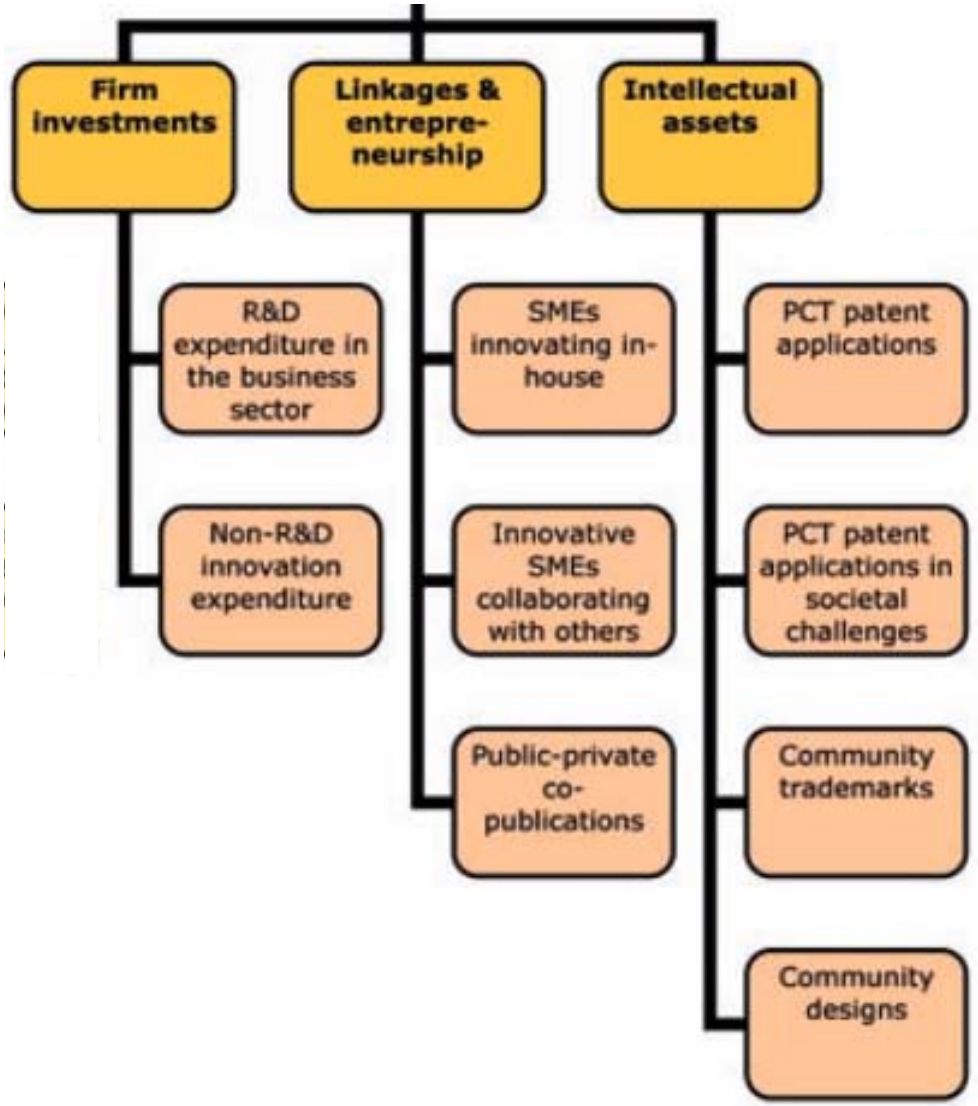


http://ec.europa.eu/enterprise/policies/innovation/files/ius-2013_en.pdf

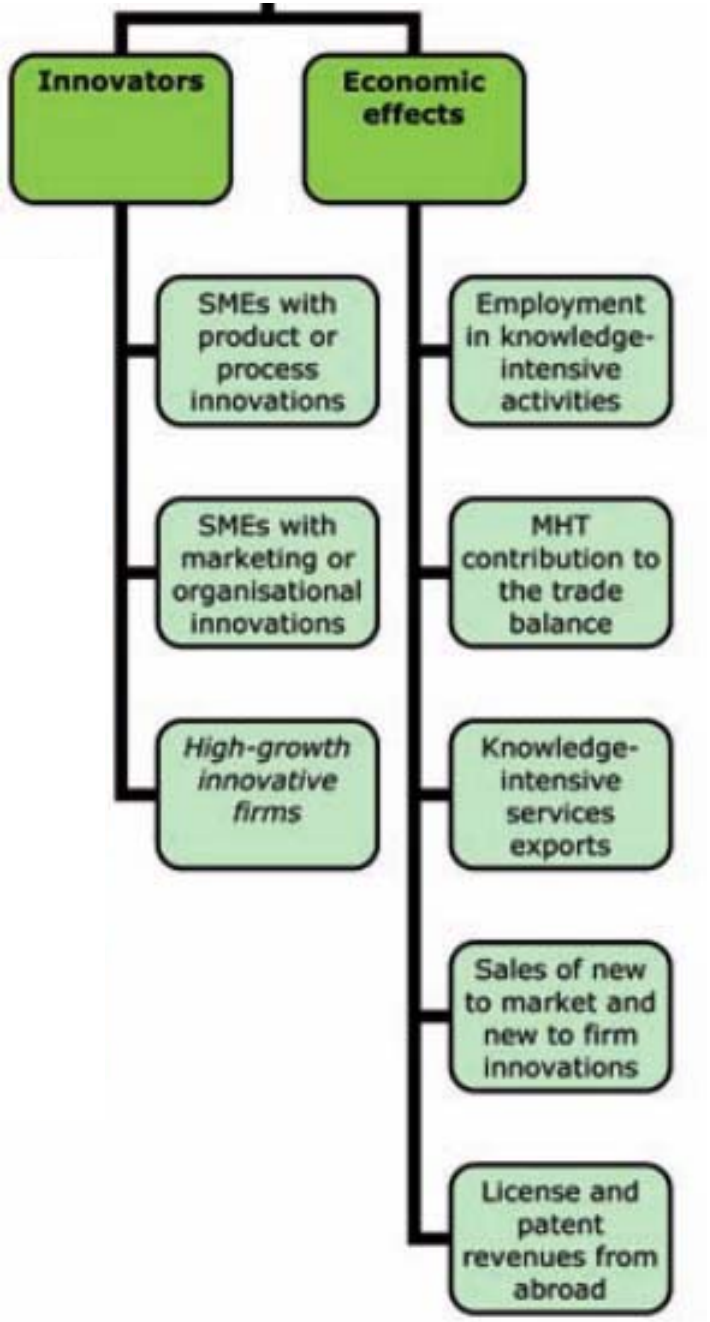
Innovation Enablers



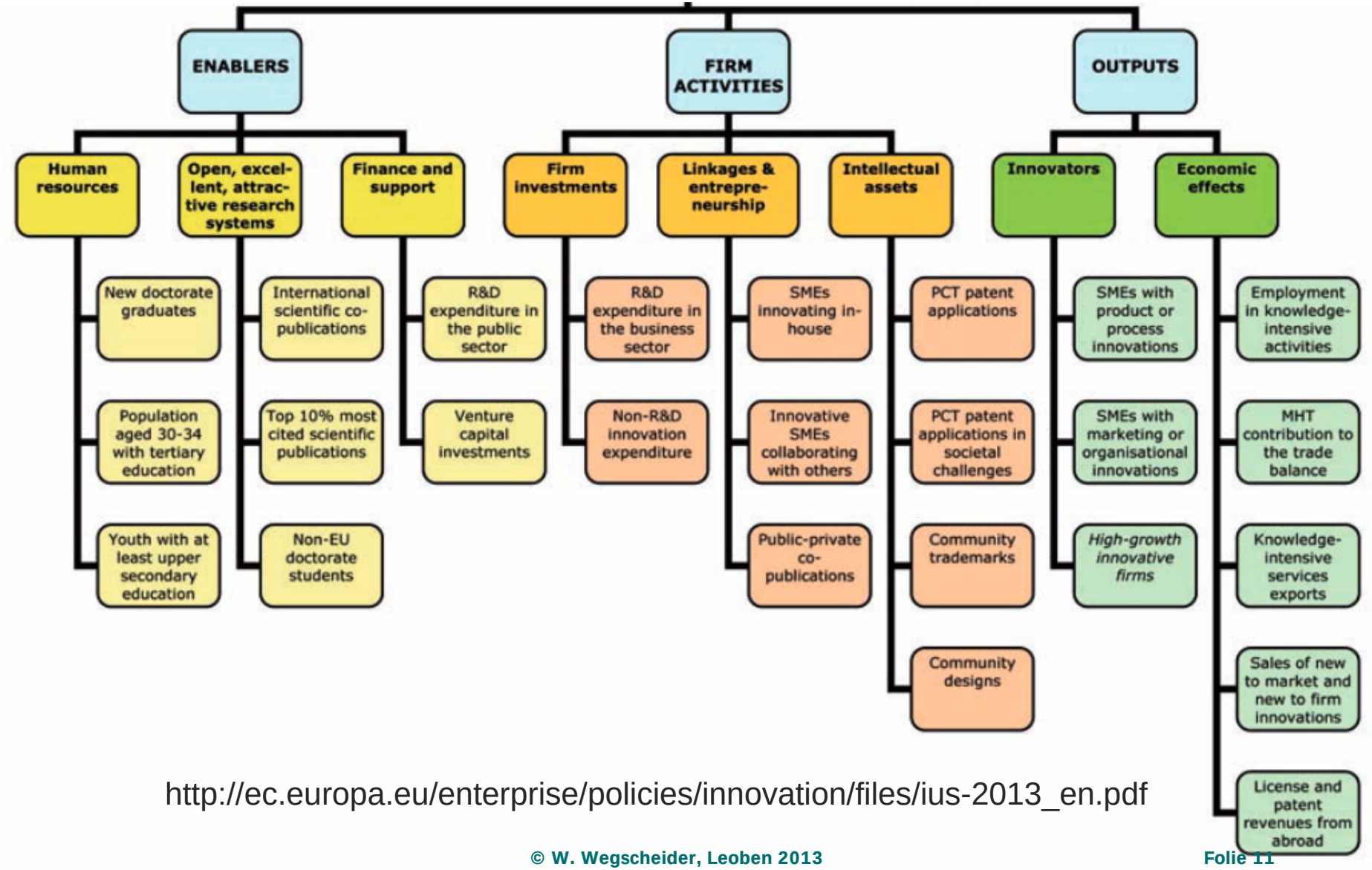
Innovation, Firm Activities



Innovation Output

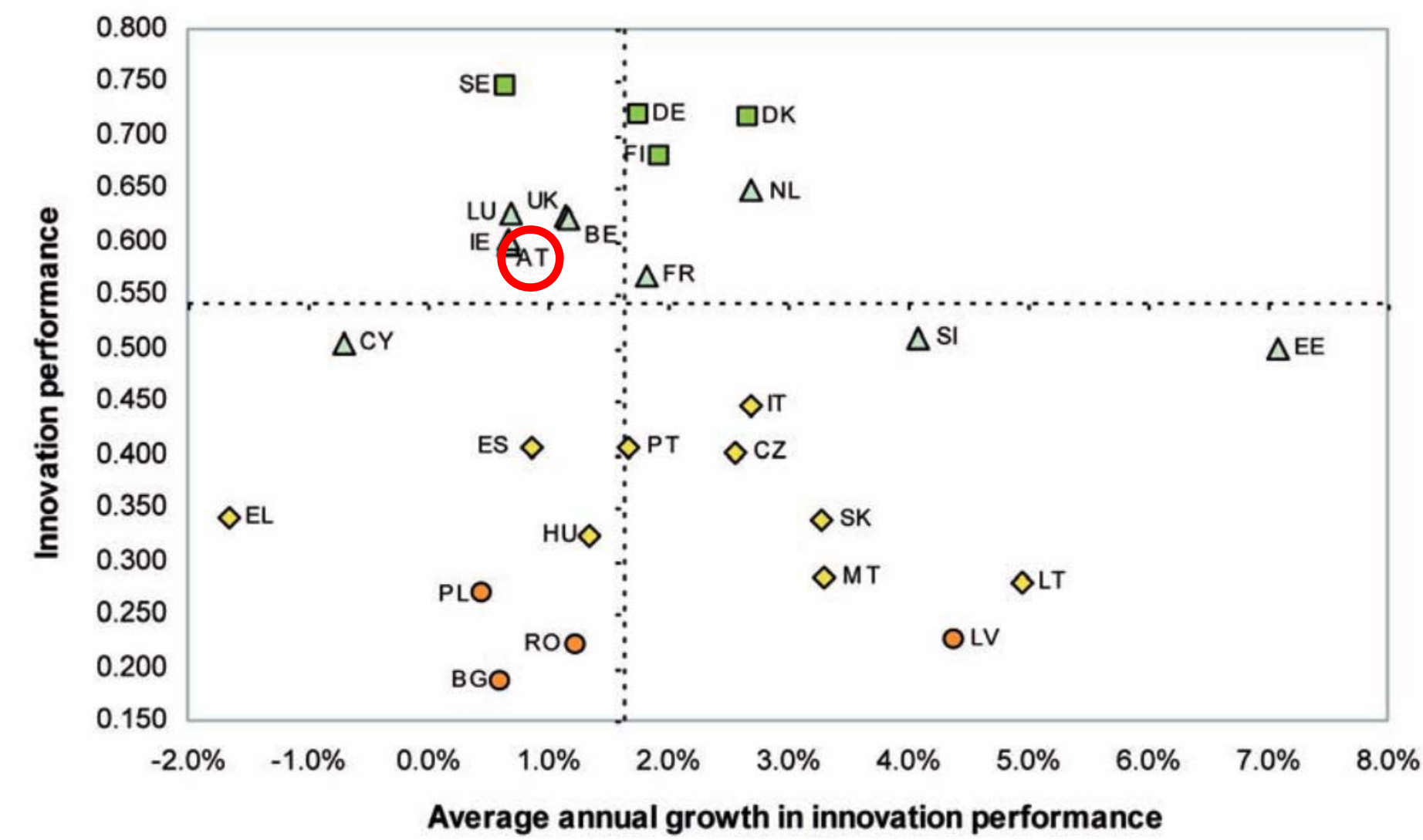


Eight dimensions, 25 indicators

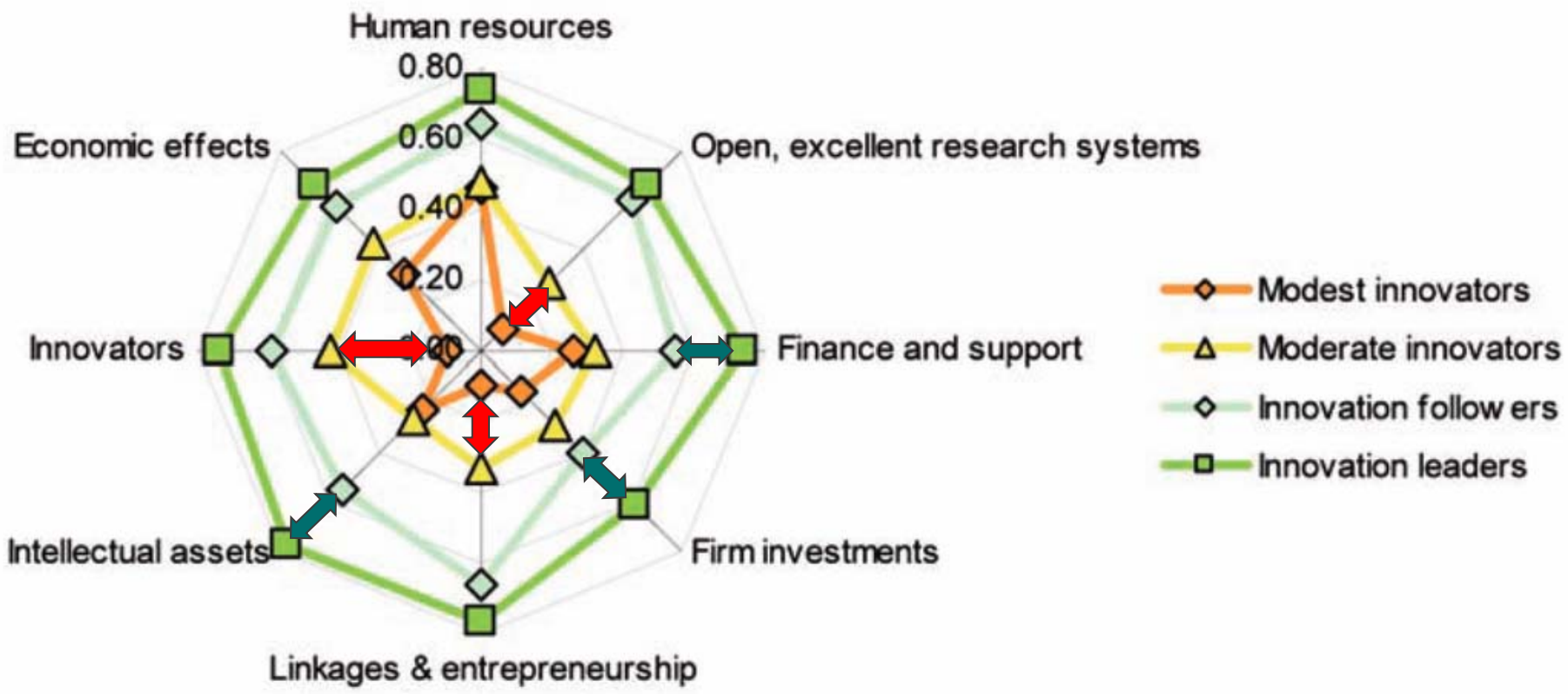


http://ec.europa.eu/enterprise/policies/innovation/files/ius-2013_en.pdf

Innovation Performance

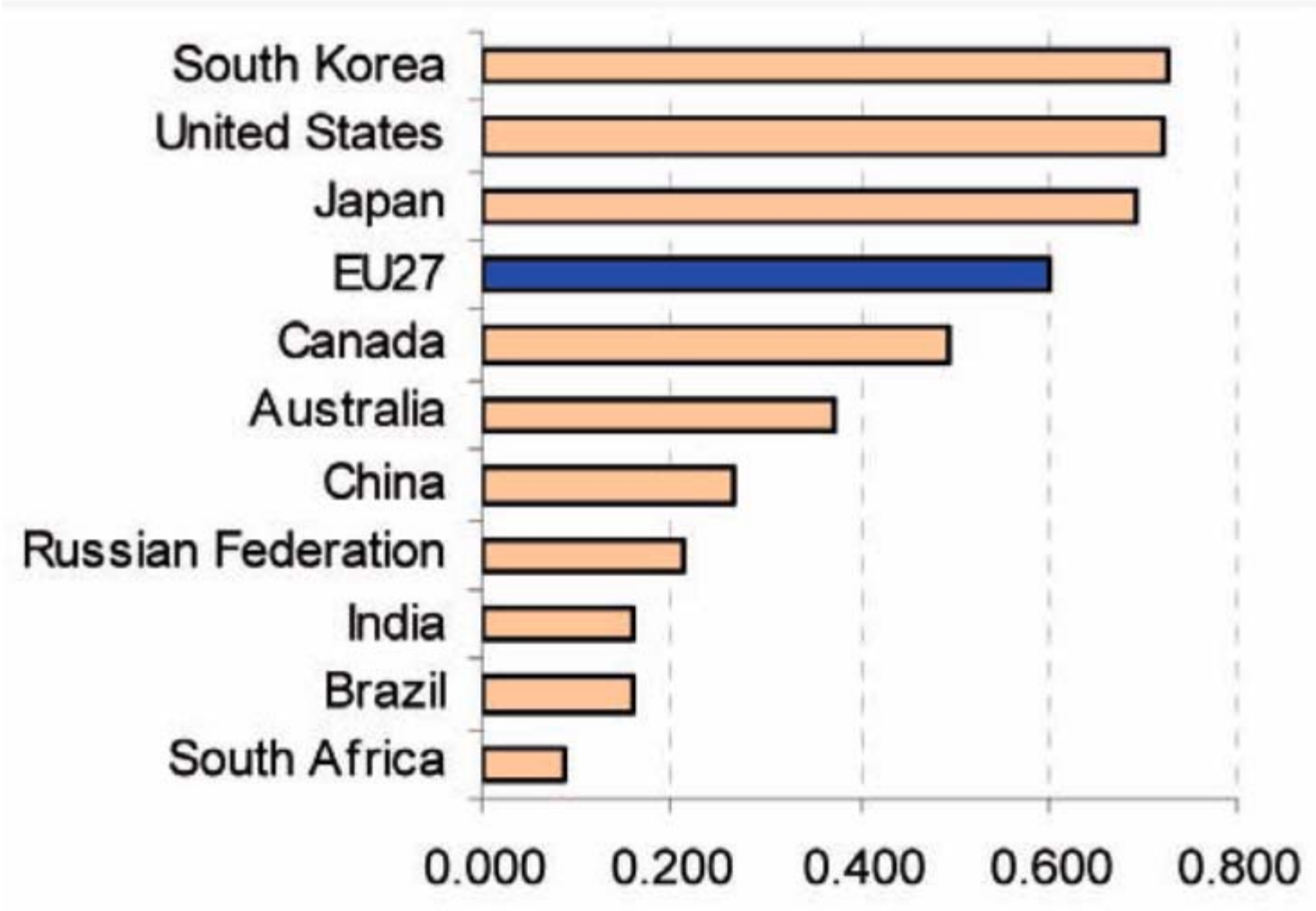


Innovation Performance in each Dimension



http://ec.europa.eu/enterprise/policies/innovation/files/ius-2013_en.pdf

Europe´s International Performance



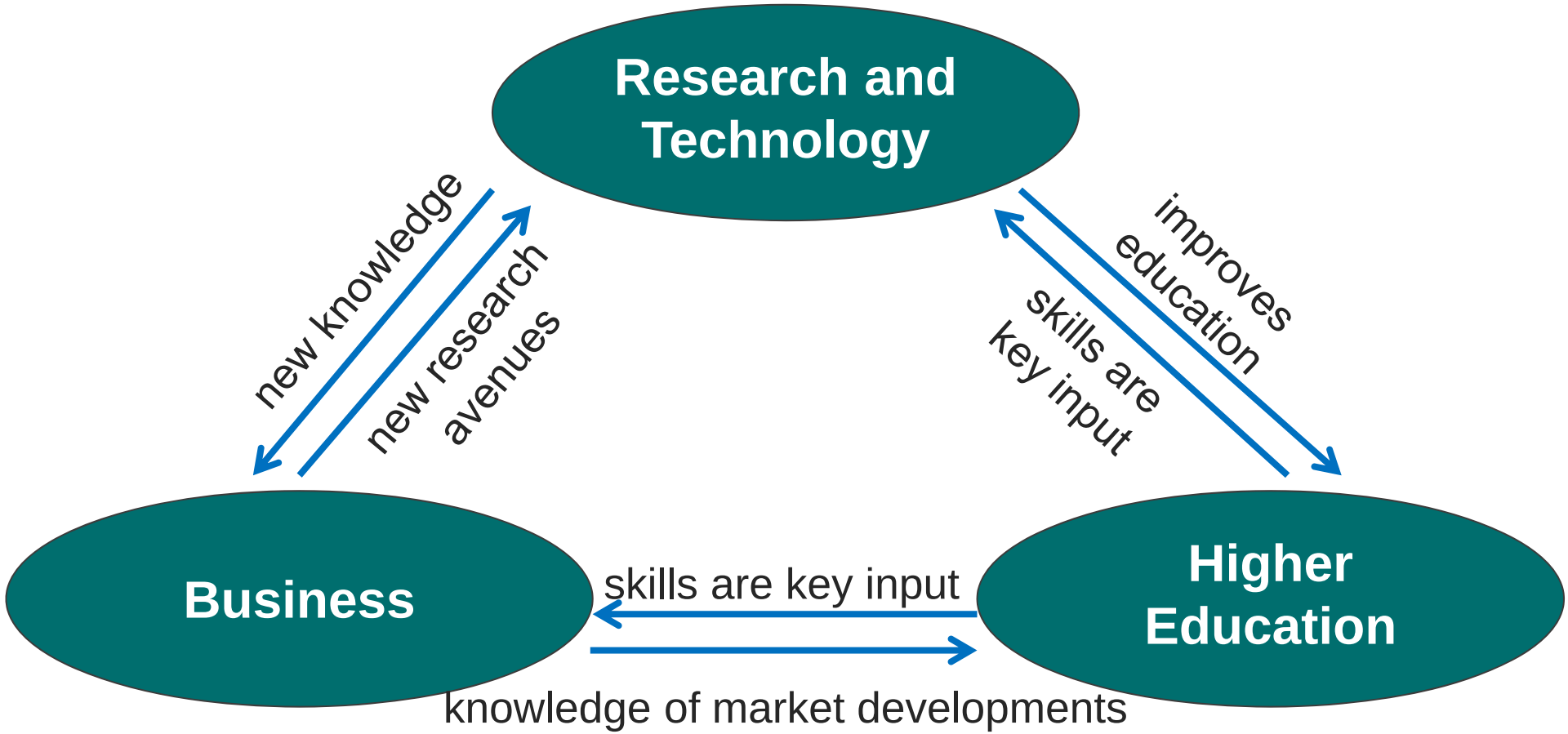
http://ec.europa.eu/enterprise/policies/innovation/files/ius-2013_en.pdf

Europe is „reinventing innovation“

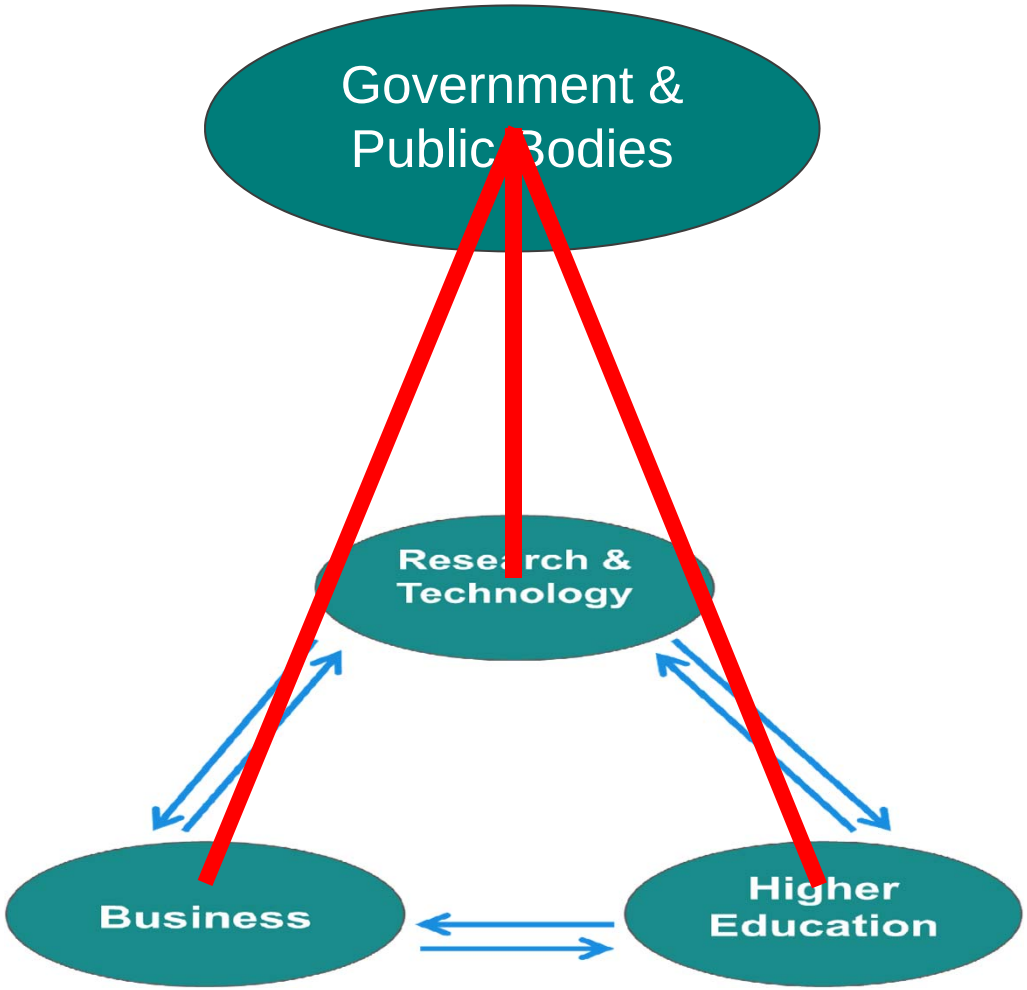
- by coupling academic research and knowledge production with an enterpreneurial spirit and
- a greater interdisciplinary focus on social and organisational practices and innovation end-users

Source: ESF and COST, RESCUE (2011)

The Knowledge Triangle



Innovation Pyramid: programs and measures



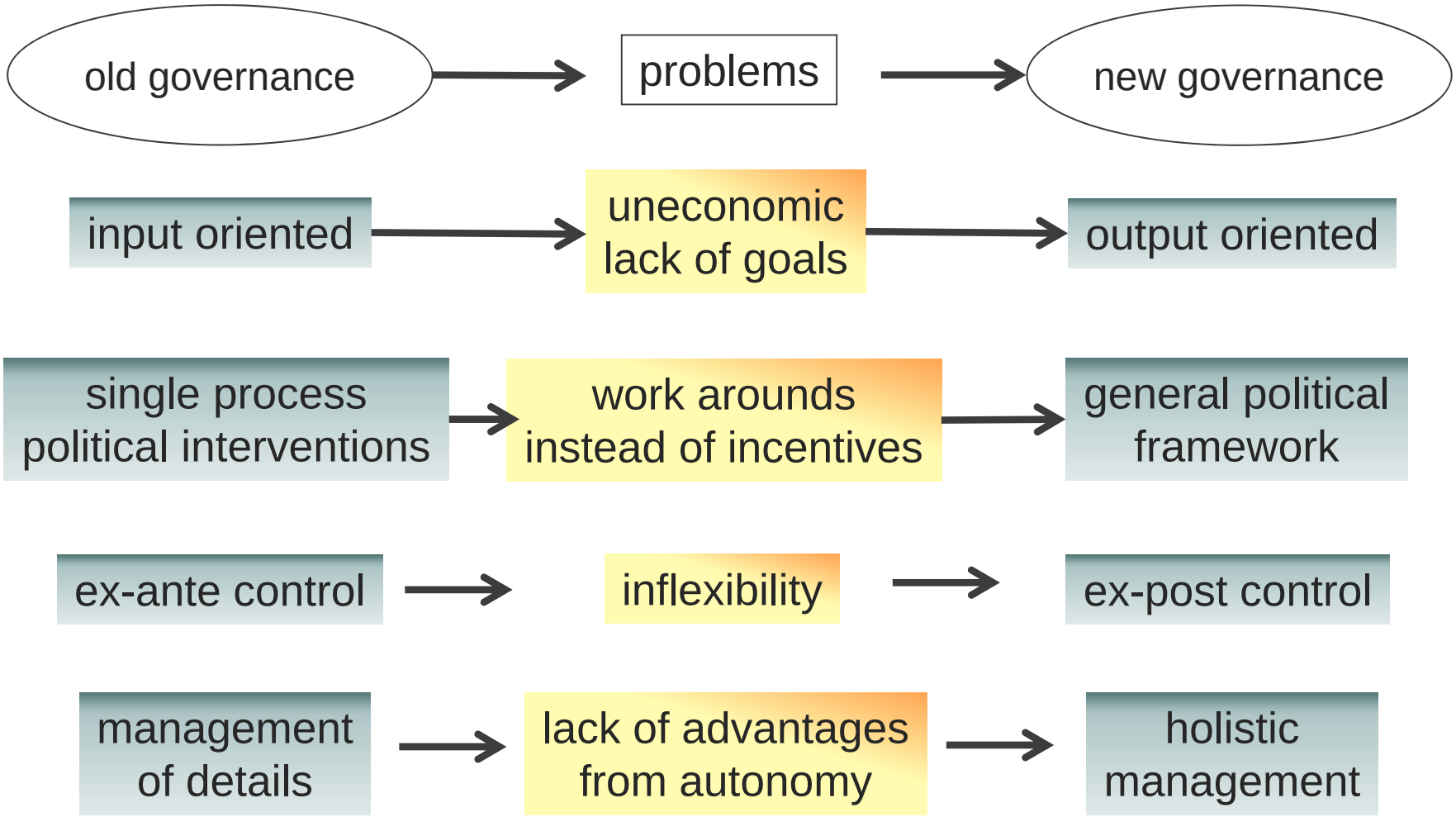
Outline

- „Definition“
- Innovation: European Problems & Approaches
- **Montanuniversitaet Leoben**
- The Elements of a
  - Boundary Conditio
  - Specific Implemen
- European Institute
  Knowledge and In

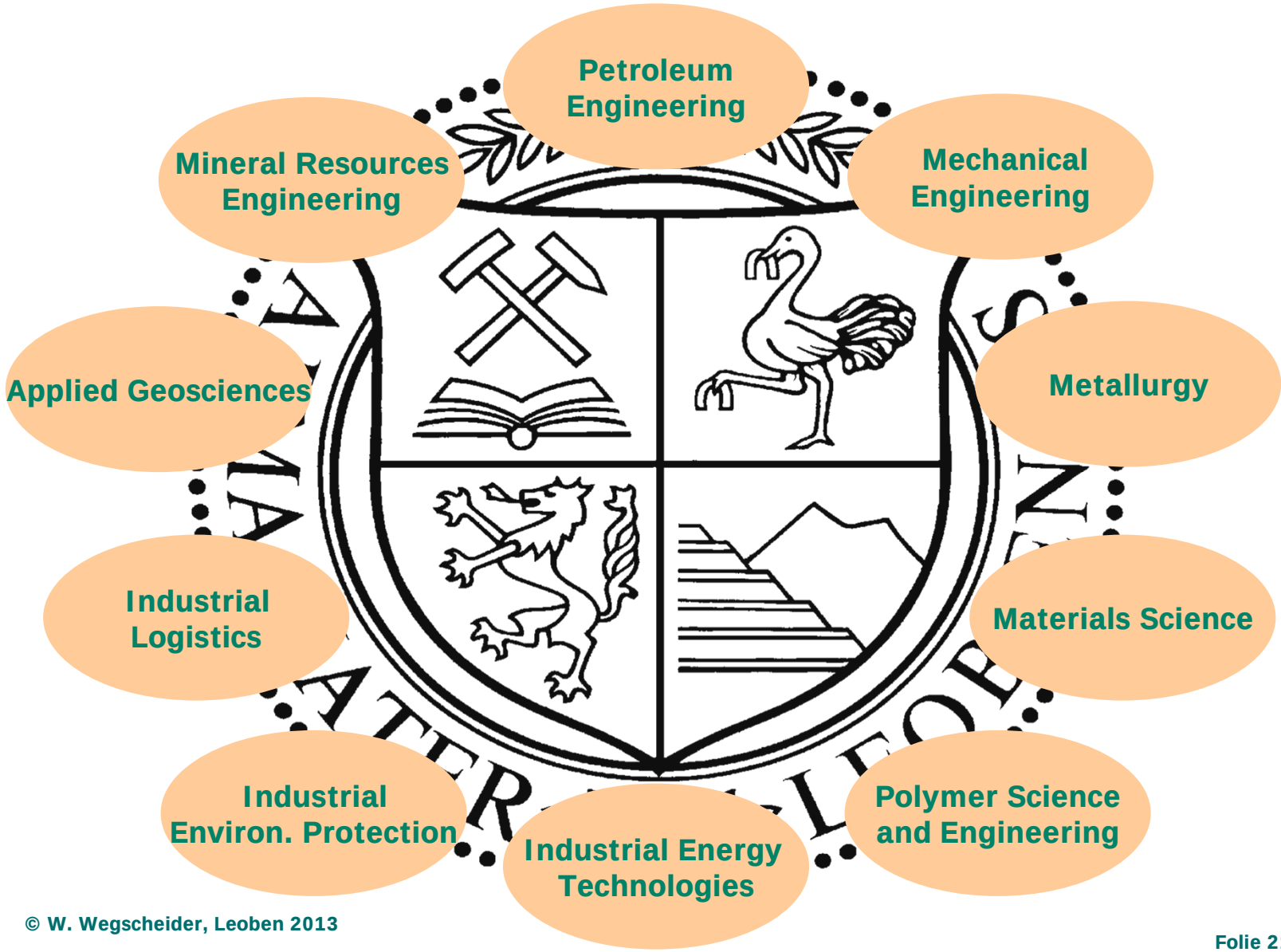
Short History of Montanuniversität

- 1840: established in Vordernberg as „Steiermärkisch-Ständische Montanlehranstalt“ under the auspices of Archduke John of Austria for metallurgy and mining
- 1849: Transfer to Leoben
- 1904: Start of doctoral program
- Since 1955: Broadening of the fields of studies
- 1975: Montanuniversität Leoben
- 2003: (New) Universities Act: „New Public Management“

New Public Management (after Ziegele)



Montanuniversität: Fields of studies



Numbers, Figures and Facts

- Enrollment: ~ 3500 students
  (women ~ 23 %)
- Winter semester 2013/14: ~ 500 beginners
- ~ 13 % students from abroad
- ~ 350 graduates per year (Bachelor, Master, Doctorate)
- Federal funds 45 Mio €, additionally 26 Mio € from fees, contracts and grants per year

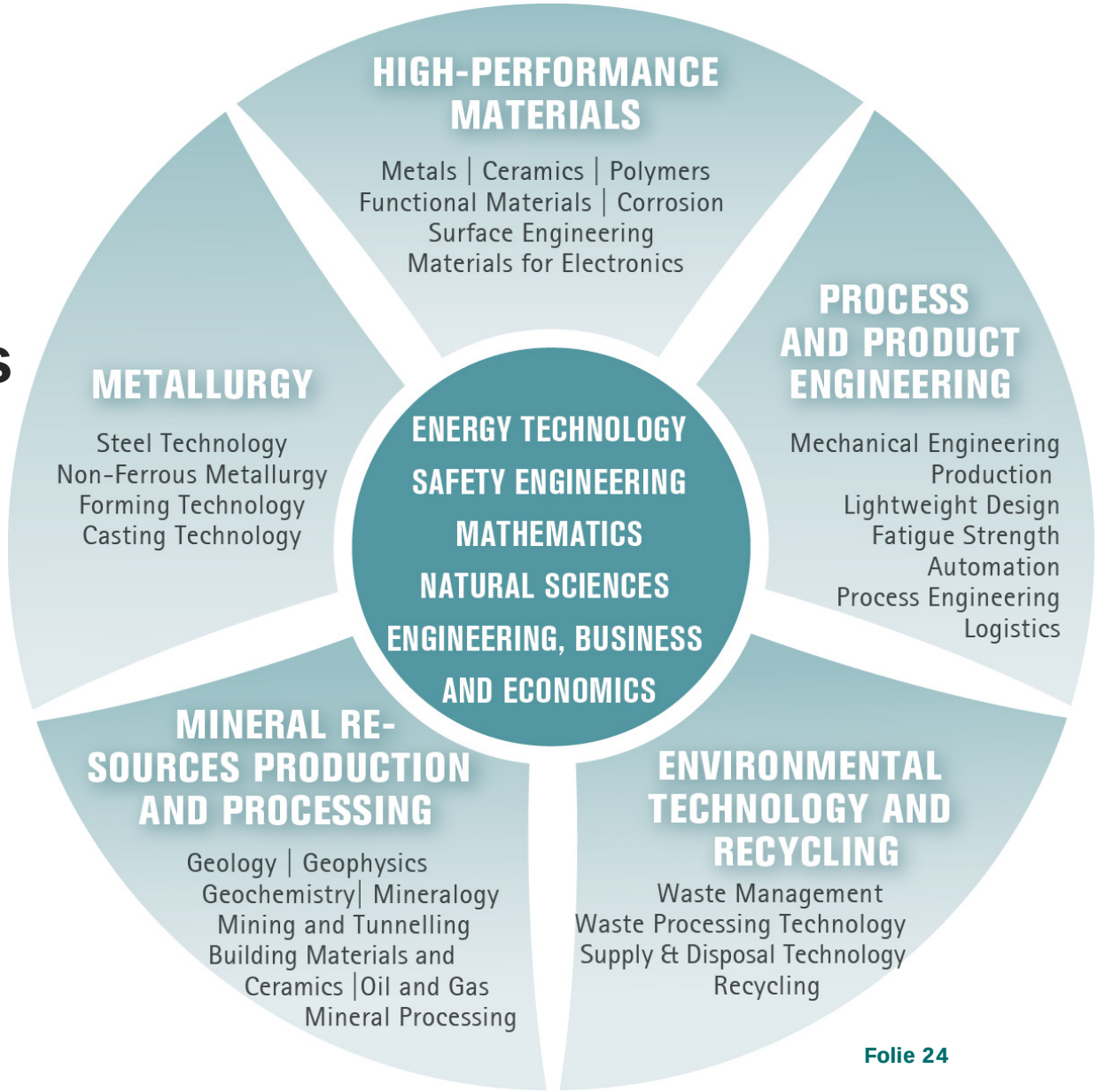
Numbers, Figures and Facts

- 1052 employees, of which 44 full professors, 712 scientific staff, 404 general employees

- About 55000 m^2 floor space
- 5 Christian-Doppler Laboratories
- 3 Competence Centers in COMET-Program
- 1 Spin-out center ZAT
- 1 Center for Technology Transfer
- More than 300 industrial partners worldwide

Leitmotiv of Montanuniversität

Research establishment with the highest aims and a focus along the industrial chain of added value



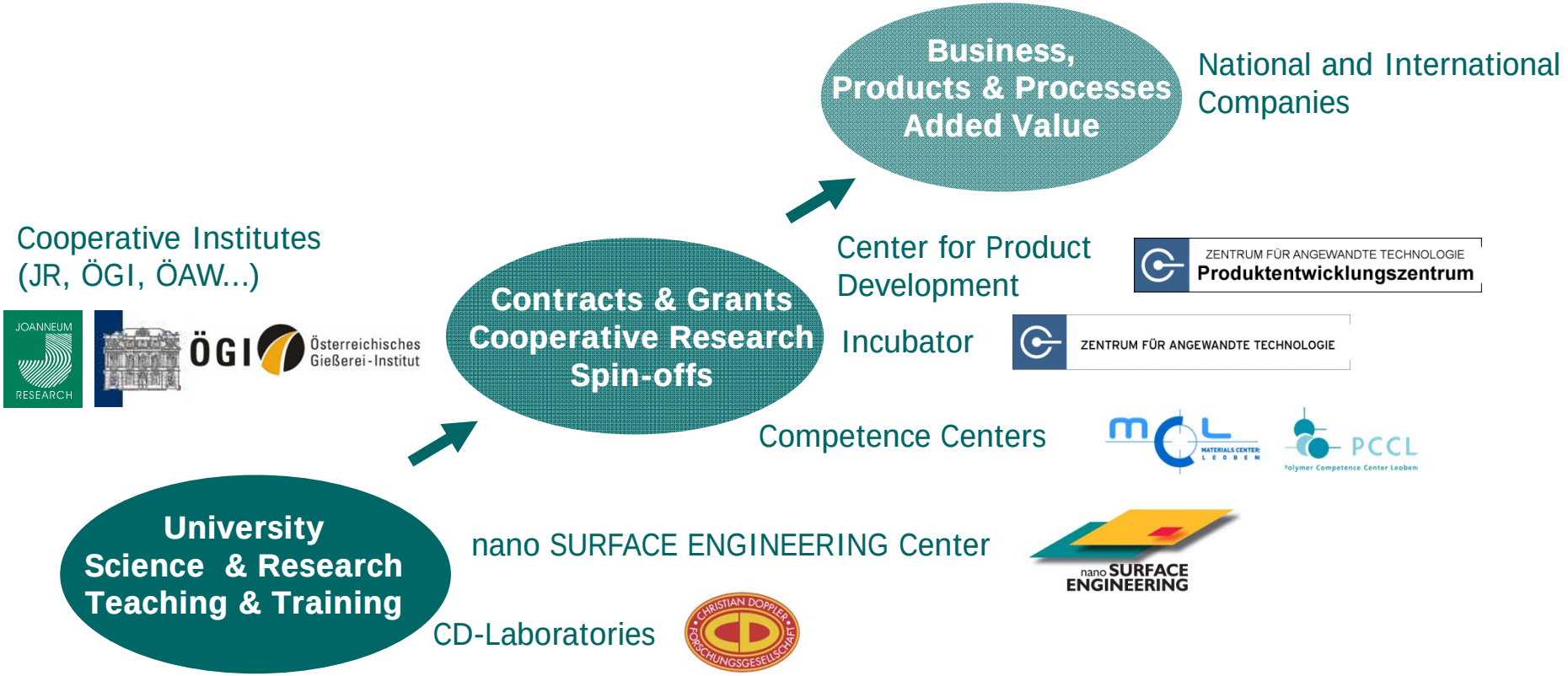
Outline

- „Definition“
- Innovation: European Problems & Approaches
- Montanuniversitaet Leoben
- **The Elements of an Innovation System**
  - **Boundary Conditions and Mechanisms**
  - **Specific Implementation and Operation**
- European Institute of Technology (EIT) – Knowledge and Information Communities

Programs and Accompanying Measures

- **Competence centers: COMET**
- **Temporary specialized laboratories: Christian Doppler Laboratories**
- **Technology transfer centers**
- **Incubators, spin-out centers**
- **Venture capital**
- **Thematic networks**
- **IP-Regulations**
- **Individual grants: Erwin Schrödinger**

From basic research to industrial production



Six active CD-Laboratories

- Early Stages of Precipitation
- Advanced Process Simulation of Solidification and Melting
- Localized Corrosion
- Optimisation and Biomass Utilization in Heavy Metal Recycling
- Highly Efficient Composite Processing
- Functional and Polymer Based Ink-Jet Inks

Advantages of CD-Laboratories

An applications oriented basic research approach helps to stay in touch with leading industries

Past CD-Laboratories

- Advanced hard coatings
- Building materials with optimized properties
- Functional design of materials
- High performance ceramics
- Applied thermo-fluid dynamics
- Sensoric measurement techniques
- Fatigue Analysis
- Local analysis of deformation and fracture
- Metallurgical fundamentals of continuous casting
- Secondary metallurgy of non-ferrous metals
- Modelling and simulation of materials

Development in COMET Competence Centers for Excellent Technologies-Program

- K2-Center „Integrated Research in Materials, Processing and Product Engineering“, MCL
- K1-Center „Metallurgy and Environmental Engineering“
- K1-Center „Polymer Competence Center Leoben“, PCCL

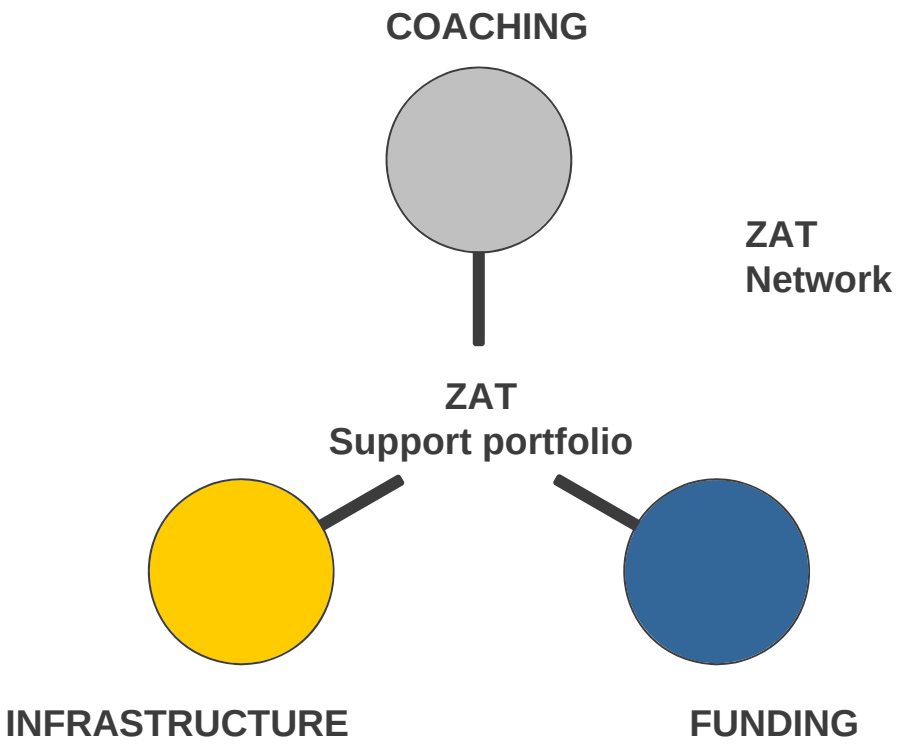
Aims of Spin-out Center - ZAT

- Building bridges between research and economy by supporting technology-orientated business foundations
- Making people interested in technology-orientated foundations
- Initiation of 5-7 new entrepreneurial projects a year
- High quality standard of supported projects
- Accompanying them with advice in the course of their implementation
- Bridging of the pre-seed/seed phase and growth phase

Spin-out Center – ZAT:
Support and Coaching

- Business development
- Application for public and private funding
- Access to the center's expert network
- Technology transfer
- Advice on different levels
- Qualification and training program
- Networking platform
- Individual support
- Project controlling

ZAT Support Portfolio



How to become a ZAT-entrepreneur:

- Presentation of the idea
- First check and discussion of the idea and the business concept
- Elaboration of the business plan based on ZAT criteria
- Presentation of the business plan to jury
- Funding contract
- Provision of mentors for the project
- Realization of the project (1.5 to 2 years in ZAT)
- Half yearly presentations, controlling meetings

ZAT Funding Scheme (in €)

Product Development:

- PreSeed: up to 15.000,- subsidy
- Seed: up to 20.000,- subsidy and 40.000,- loan
- Growth: up to 20.000,- subsidy and 40.000,- loan

Service Provider:

- PreSeed: up to 15.000,- subsidy
- Seed: up to 20.000,- subsidy and 40.000,- loan

ZAT Projects

ferroDECONT | www.ferrodecont.at

solutions for decontamination of abandoned industrial sites, as well as the treatment of heavy metal polluted industry and process water

CleverContour | www.clevercontour.com

rapid prototyping method for personalized wheelchair-seats and protective equipment

IM-Polymer | www.impolymer.at

"Polymerpapier®", a sustainable, synthetic plastic film made from sustainable raw materials as an environmentally friendly alternative to conventional petrochemical plastics and cellulose paper and aluminium composites

SeaBear – diving technology | www.seabear.com

new technologies for novel underwater instrumentation like diving computers, head-up displays and rebreathers

ZAT Projects, 2

SCH.EPP OG | www.schepp.at
physical therapy device which promotes neuroplasticity for stroke patients who are suffering from immobility resulting from a stroke

EcoCan GmbH | www.ecocan.at
energy-efficient lighting concepts with optical foils and reflectors

KSZ GmbH | www.ksz-gmbh.at
support in the field of prototype-optimization and batch-production

SYNVO GmbH | www.synvo.com
next generation of speech synthesis solutions for use in various mobile devices, like smart phones, tablet PCs or navigation devices

iam-gum | www.iam-gum.com
development and production of 3D-chewing gum with injection moulding

ZAT Projects, 3

DCES Dynamic components KG | www.dynamic-dces.at
components for supervising and regulating biogas plants on a new level

TreeChip GmbH | www.treechip.com
turnkey logistic solutions for the Christmas tree growers based on radio frequency microchips technique

I'n'stein Research & Development GmbH | www.i-n-stein.com
development of mirror-concentrating solar collectors

Xohana e.u. | www.xohana.com
internet platform based on simple intelligent suggestion interface technology

Sailmon GmbH | www.sailmon.com
high performance electronics and race computers for yachts

ZAT Projects, 4

FronTone GmbH | www.frontone-automotive.com
test systems for vehicle interior and front testing, especially in the areas of occupant and pedestrian protection

B4b-highway GmbH | www.b4b-highway.com
internet platform supporting sales in the field of metalworking

Lösch Cellular Engineering Ziviltechniker GmbH | www.lce.co.at
construction units out of regular cellular materials

Makava delighted GmbH | www.makava.at
Makava Bio Delighted Ice Tea based on mate tea

Mettop GmbH | www.mettop.com
process optimization in nonferrous metallurgy - pyro- and hydrometallurgy of copper, as well as optimization work in the area of furnace construction

ZAT Projects, 5

NGS – Neuro Genetic Solutions GmbH | www.bestneural.net
development and application of neural network based software solutions for detection and memorizing relationships in data and for sustainable acquisition of human experts' know-how and experience

OXY3 – Ozongeräte Produktion GmbH | www.oxy3.at
new processes and products in the areas of disinfection and sterilization

Proionic GmbH | www.proionic.com
innovative processes driven by ionic liquids (fluid salts behaving like solids)

Mine-IT Sanak-Oberndorfer GmbH | www.mine-it.at
Data management system for raw materials

pro aqua – Diamantelektroden Produktion GmbH | www.proaqua.cc
diamond electrode for the supply of clean water as well as quality assured liquid media and purified waste water for discharge to the environment

ZAT Projects, 6

Successfactory management coaching gmbh | www.successfactory.cc
Consulting, coaching and training regarding quality management, innovation and engineering

APC – advanced polymer compounds | www.a-p-c.at
reactive modification (impact modification, fibre reinforcement) of engineering plastics like polyamides or polyester

GEWOTECH technology Ingenieurs GmbH | www.gewotech.at
analyses of manufacturing processes, supported by exact simulation calculations

SimCat Technologies | www.simcat-tech.com
IT-Solutions in the field of data security

4a engineering GmbH | www.4a-engineering.at
concept finding and optimization of product ideas with a focus on plastics engineering and materials science

Outline

- „Definition“
- Innovation: European Problems & Approaches
- Montanuniversitaet Leoben
- The Elements of an Innovation System
  - Boundary Conditions and Mechanisms
  - Specific Implementation and Operation
- **European Institute of Technology (EIT) – Knowledge and Information Communities**

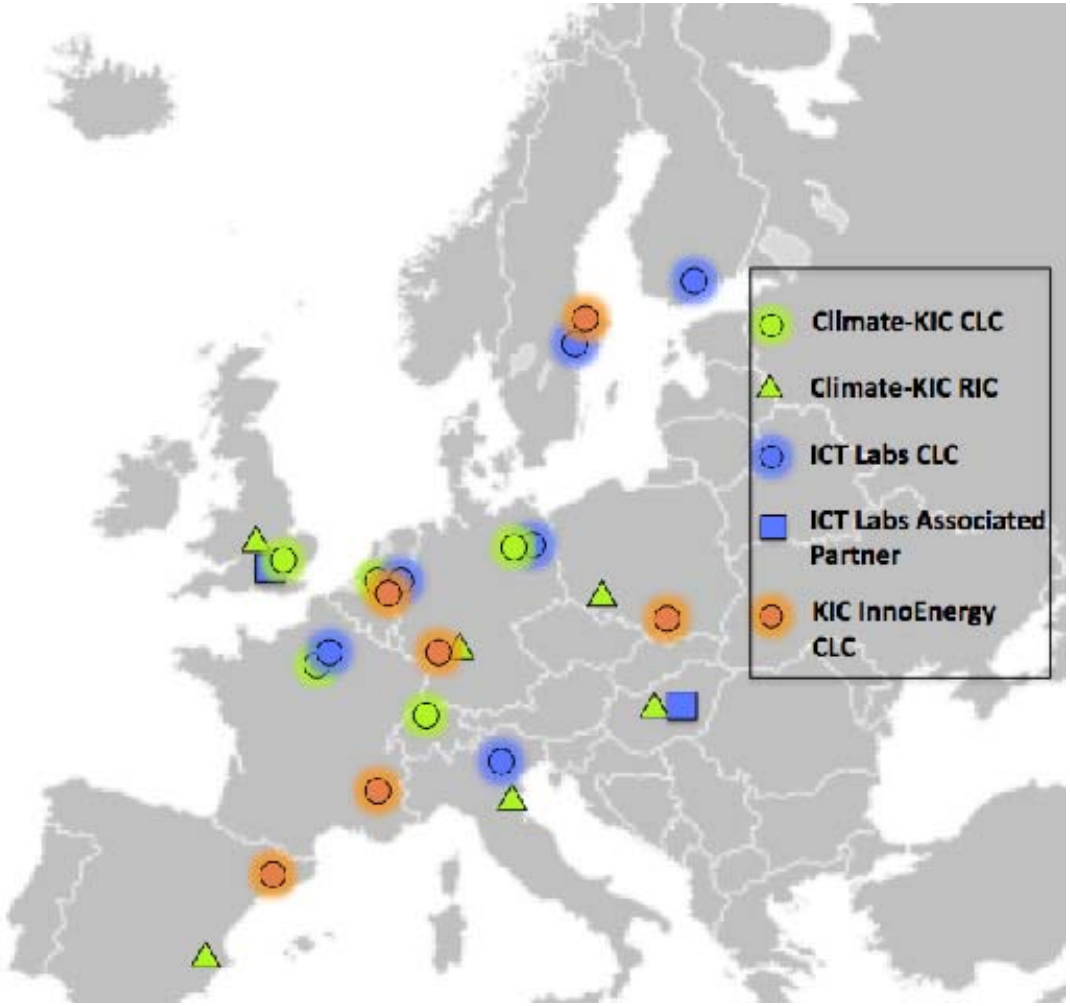
European Institute of Technology (EIT)

- **established in 2008**
- **„*to increase European sustainable growth and competitiveness by reinforcing the innovation capacity of the EU*“**
- **operates through distributed networks of „Knowledge and Innovation – Communities (KIC)“**

Source: EIT Regulations, 2008

EIT - Knowledge and Innovation Communities (KIC)

- Climate-KIC
- EIT ICT Labs
- KIC InnoEnergy



Planned 2014:

- **Raw Materials**
- **Healthy Aging**

http://eit.europa.eu/fileadmin/Content/Downloads/PDF/Key_documents/EIT_publication_Final.pdf

EIT Entrepreneurship

- Fostering the development of new businesses
- Organising a European-wide specialised business support that is committed to finding the first customer for young ventures
- Accelerating time to market of innovations through demonstration actions, facilitating experience labs and demand-side measures

http://eit.europa.eu/entrepreneurship/

Conclusion: The Role of Universities

- Education and training for researchers, inventors and innovators
- Provision of expertise
- Knowledge pool
- Scientific and technological trend scout
- Source of scientific critical mass
- Major regional investor
- Companion in first steps of inventors
- Understanding and reflection of innovation

Thank you for your interest