

Research, Education and Innovation Bundling Forces towards a Sustainable European Energy Future

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Chief Science Officer KIT & Chairman KIC InnoEnergy SE

Executive Board



Sustainable European Energy Future

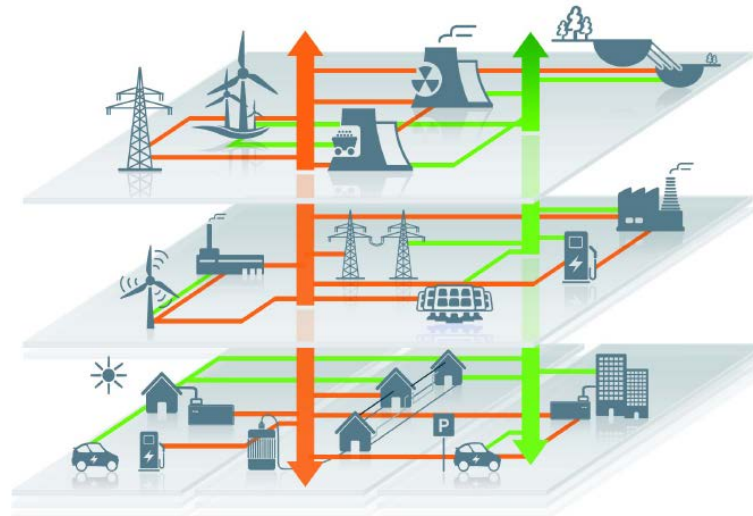
Cornerstones

- Secure, reliable and achievable energy supply
- Technically safe
- Caring climate & environmental issues
- Economic Efficiency
- Equity of Access to Energy



„German Energiewende“ – Political Goals

	<u>2020</u>	<u>2050</u>	<u>reference</u>
■ CO ₂ -Emissions	-40%	-80-95%	(1990)
■ Consumption of Primary Energy:	-20%	-50%	(2008)
■ Gross Electricity Consumption:	-10%	-25%	(2008)
■ Ratio of Renewable Energies: <i>(on Gross Electricity Consumption)</i>	35%	> 80%	(2008)



EIT Mission

The EIT creates an unprecedented level of collaboration between innovation and excellence centers with the aim of **boosting the innovation process**:

■ **from idea to product**



■ **from lab to market**



■ **from student to entrepreneur**



EIT budget 2008-2013: EUR **308.7 million**

EIT \leq 25% of total KIC budget

Proposed budget for 2014-2020: EUR **3.18 billion**

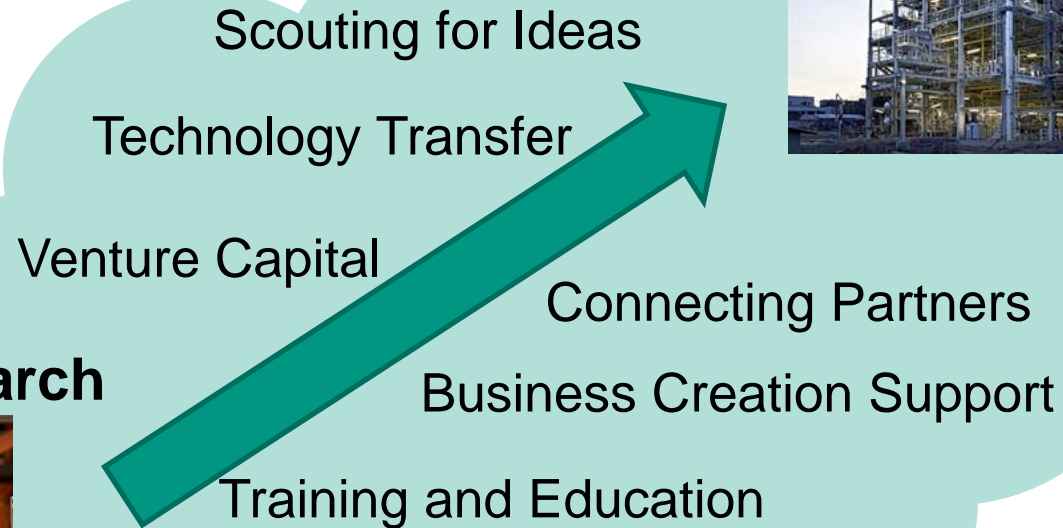
From Idea to Business

and the steps between

Industrial Application



Academic Research



From Idea to Business

KIC as a 1 stop shop

Industrial Application



Academic Research



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KIC InnoEnergy SE

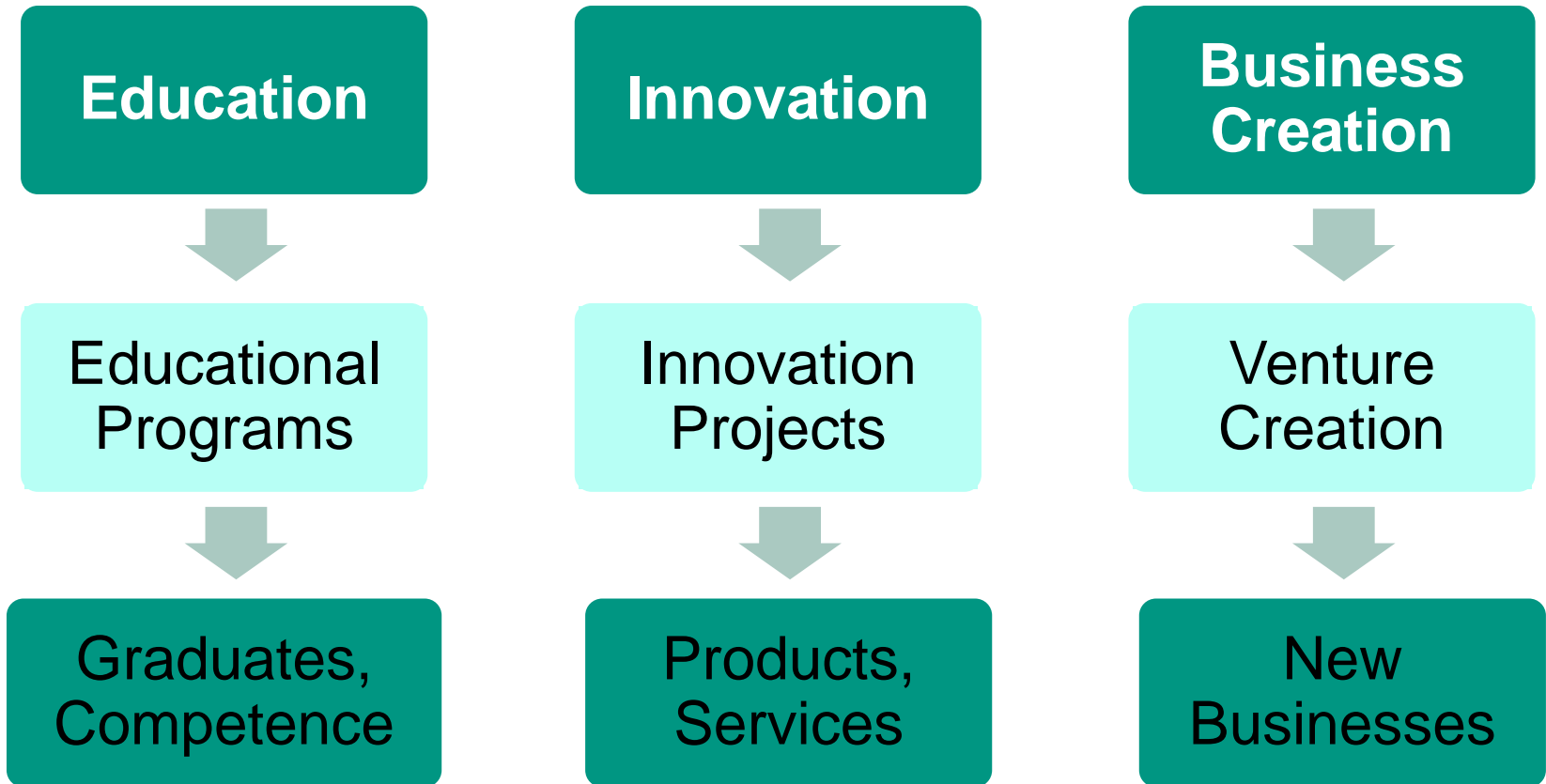
A new innovation engine, output oriented

- **Integrating** Education, Research and Business
- Fully **aligned** with the **SET plan**
- **Complementing** other EU instruments

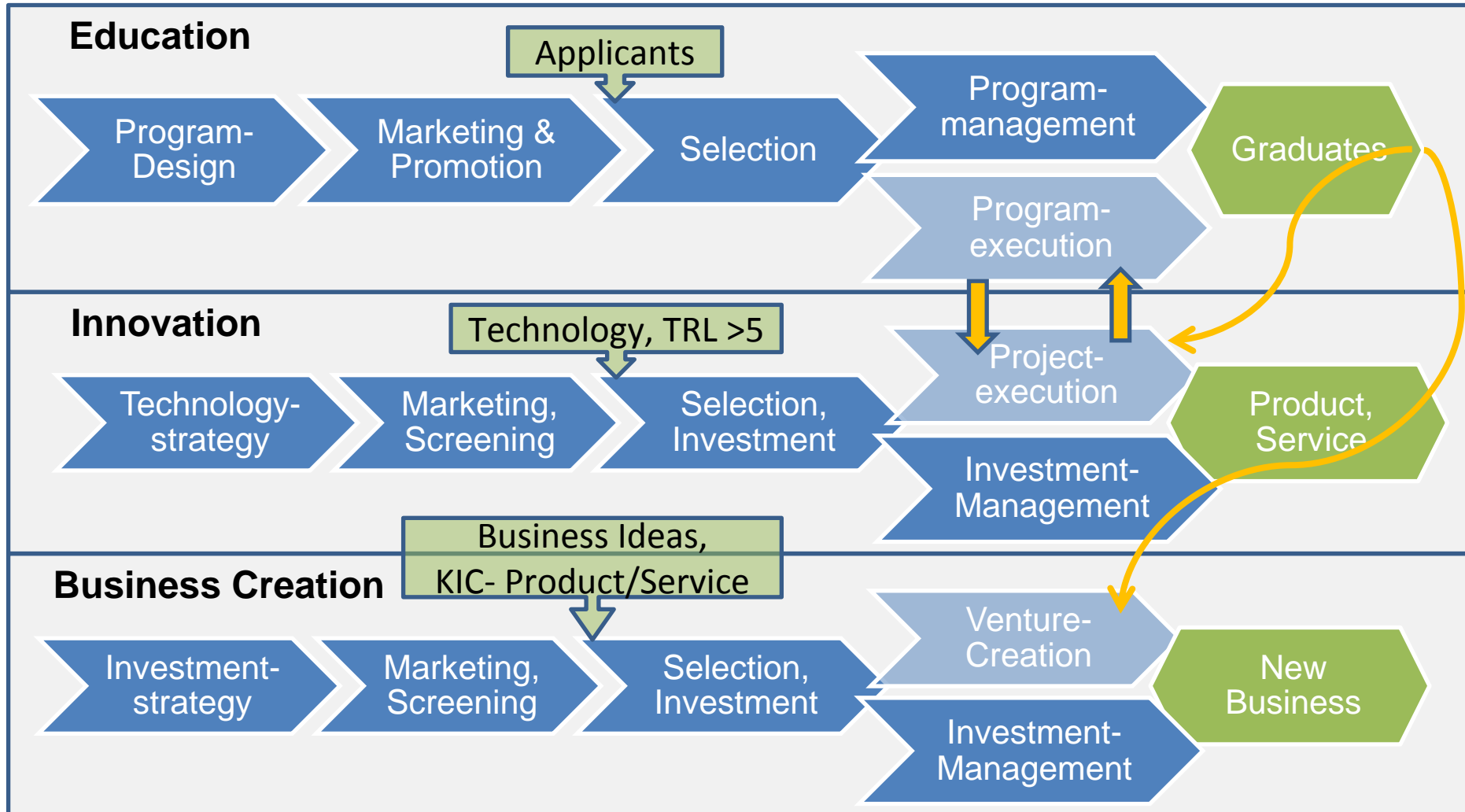
A **company run as a company**, simultaneously fulfilling a **European societal mission**



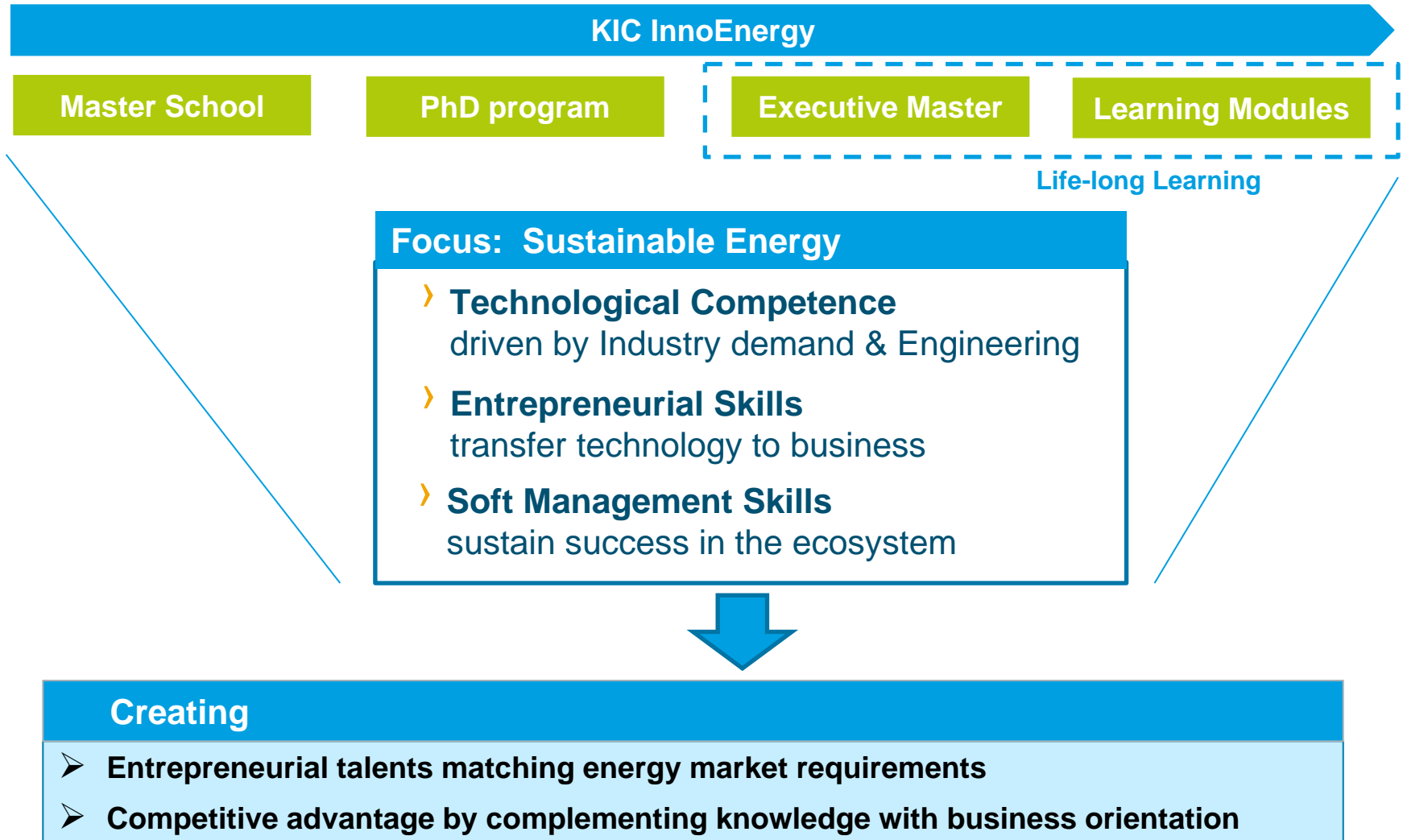
Business Lines of KIC InnoEnergy



Value Chains of KIC InnoEnergy



Education



Innovation

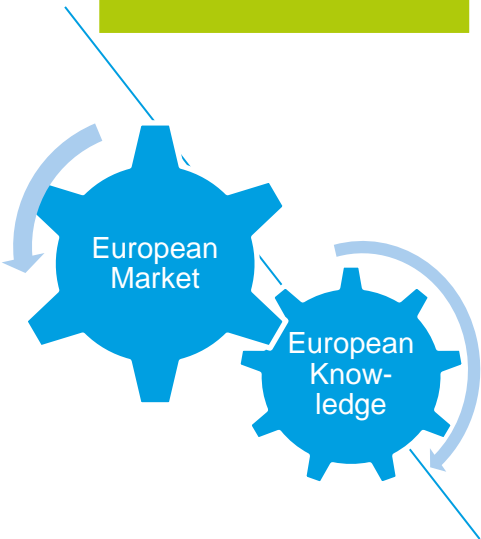


Open Innovation

International Syndicates

Industry and Economy

Integration of Education



Focus: Commercializing

- › **6 Innovation Fields**
Covering the Energy Supply Chain
- › **Integration of Competences**
Technology and Market
- › **Monitoring of Results**
Commercializing within 3-5 years



Creating

- **New products and services on the basis of sustainable technologies**
- **Commercial success by cooperation of relevant players from industry and research**

Business Creation



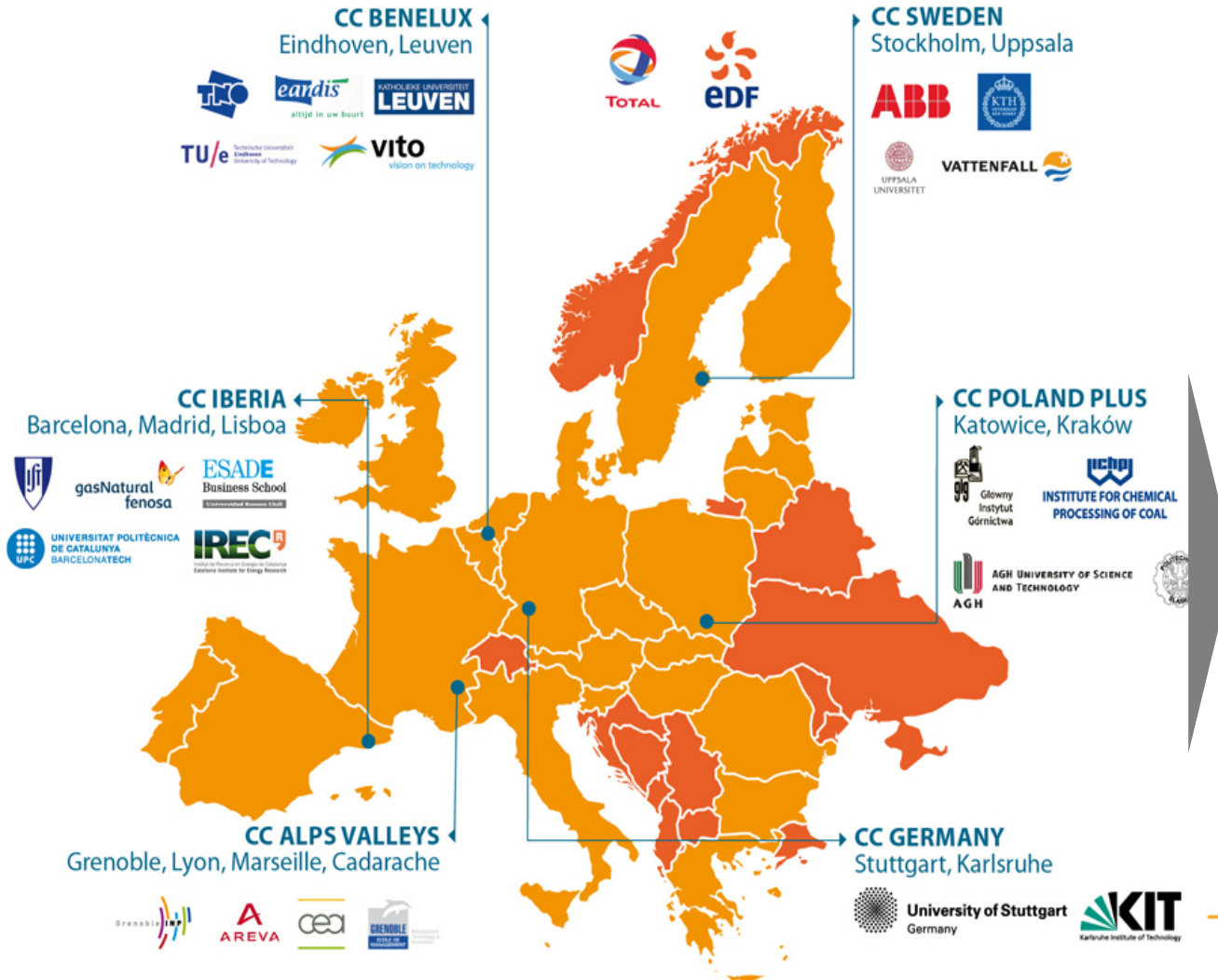
Focus: Sustainable Energy

- > **Integration**
Supplement of existing instruments
- > **Network**
European business contacts
- > **First Costumers**
strong commitment

Creating

- **New companies or expansion of business fields in existing companies, especially small and medium-sized companies**
- **Business success by access to markets and proven relevance on markets**

The Principle of Colocations



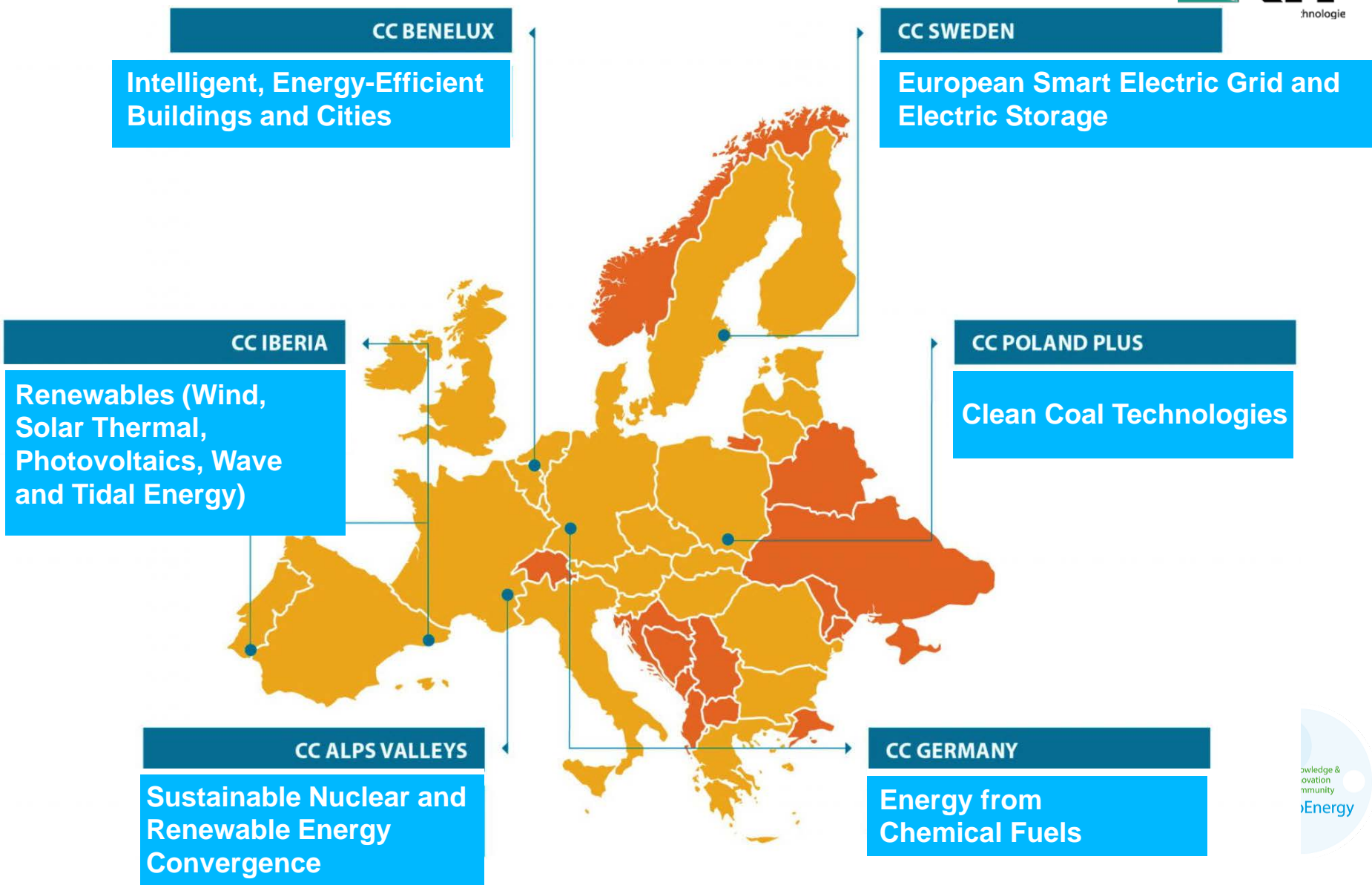
Partner 2012:

- 142 total
- 98 industry, incl. 42 SMEs

- Excellence
- Relevance
- Competence
- Market coverage
- Market access



Thematic topics of KIC InnoEnergy



KIC InnoEnergy innovations cover the entire value chain of the energy system



Resources

Conversion

Transmission

Distribution

Consumption

Energy from
Chemical Fuels

Renewables

Clean Coal
Technologies

Sustainable nuclear
and renewable
energy convergence

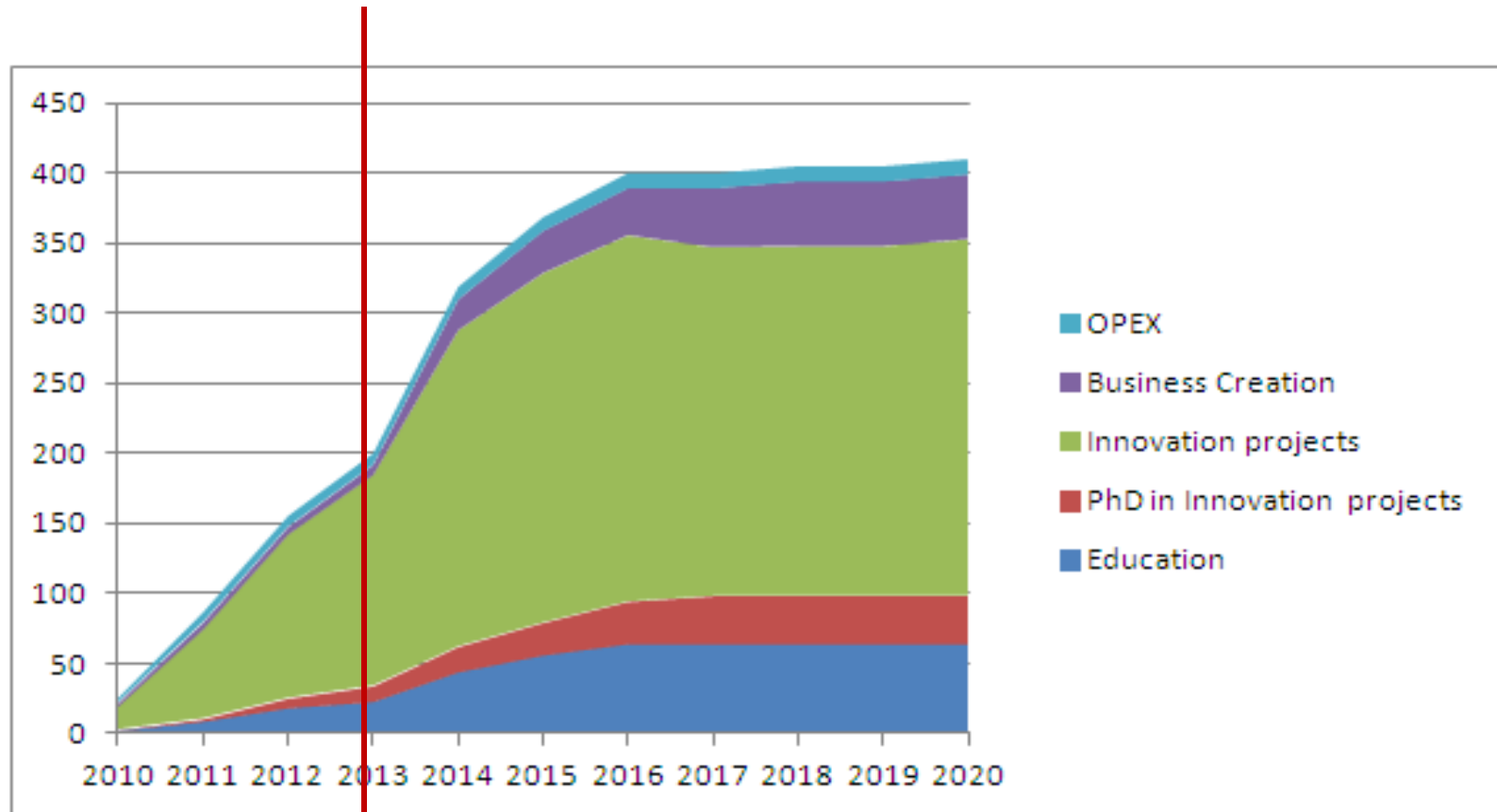
Intelligent energy-efficient
buildings and cities

Smart electric grid and
electric storage

Technology
roadmaps for
2022 developed

Lighthouse Inno Drivers

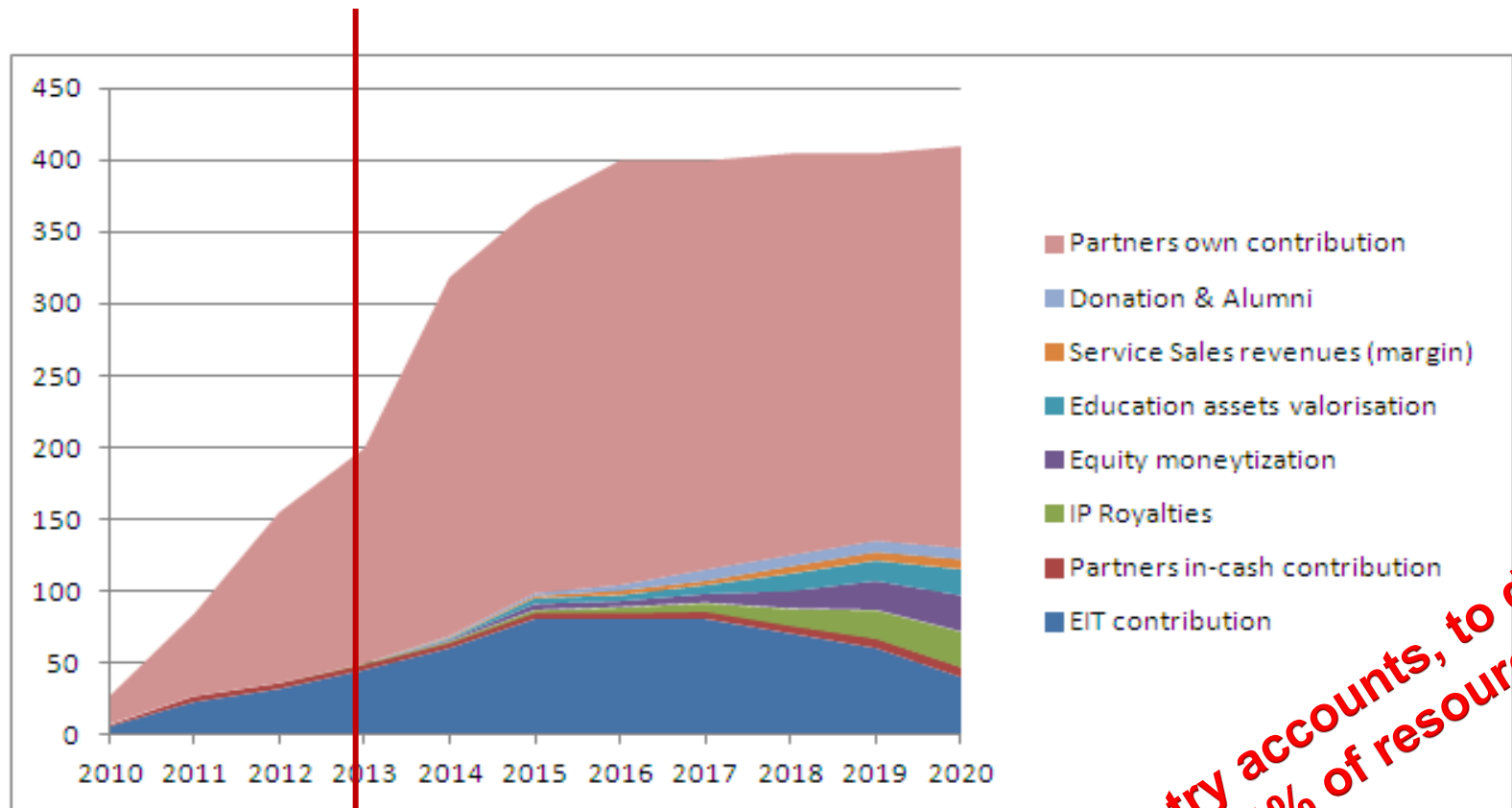
Perspectives: Business line view



KIC InnoEnergy business plan budget (€m) split by business line 2010-2020



Perspectives: Financial sourcing view



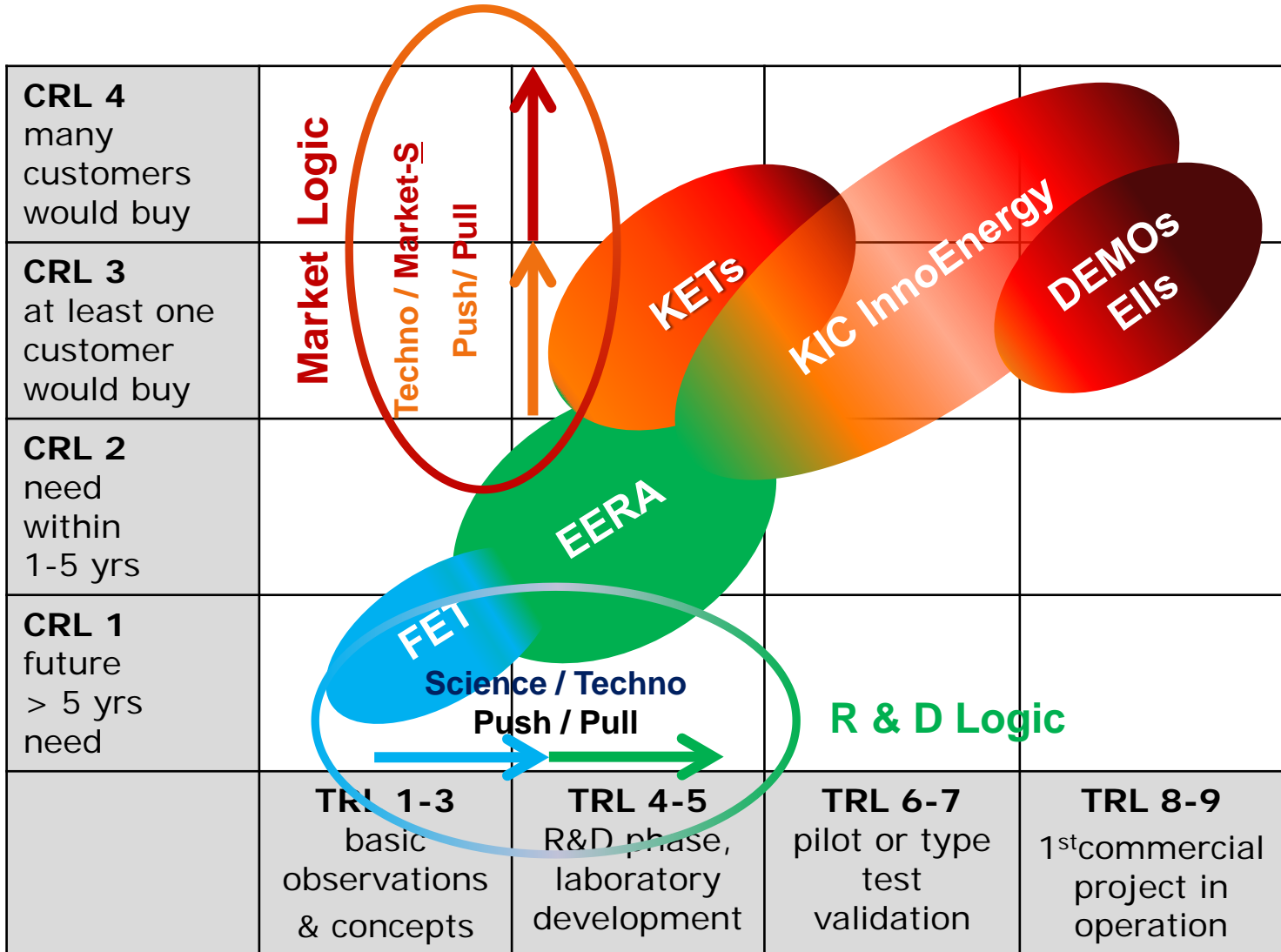
Industry accounts, to date, for 31% of resources

KIC InnoEnergy business plan financing (€m) split by source 2010-2020



KIC operating area vs other EU instruments

Customer Readiness Level



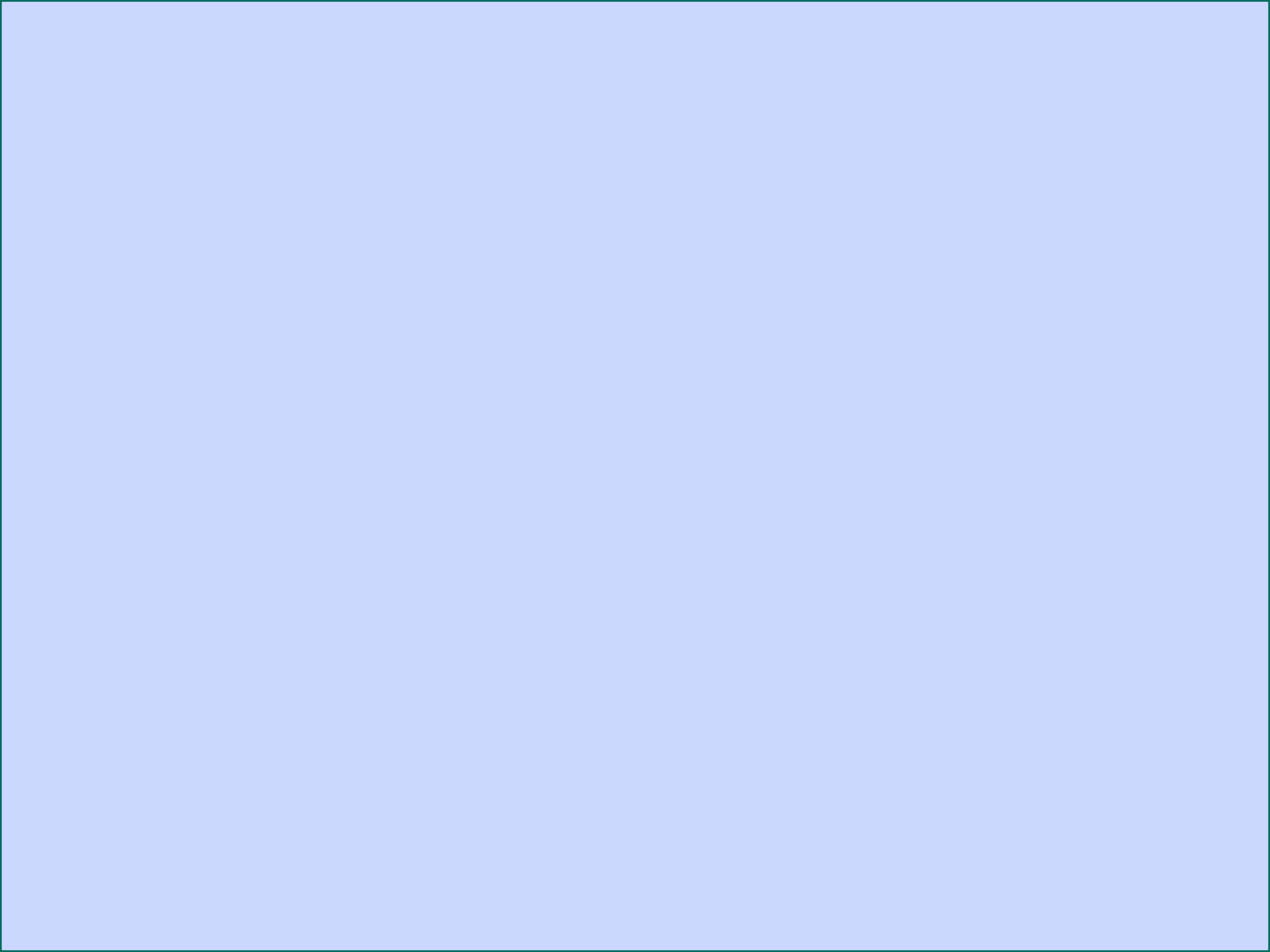
Technology Readiness Level

Summary

- We are a **different company** established to have societal impact on **Europe**
- Parents: **Industry** and **Academia** - Balanced
- **Excellence** of a project (education program / concept /idea / technology) is our first priority
- The **innovation engine**: we deliver business creation **and** human resources
- Focus on energy: Future **European energy** landscape and **KIC positioning**
- **Societal tasks**: job creation, economic implementation of Know-How, strengthening European economic power, creation of new competences,
- Innovation: making R&D results **generating value**
- **Business duties**: secure revenues, increase KIC company value in order to be financial sustainable, not for dividend

KIC InnoEnergy for a sustainable energy future





Innovation Projects: Energy From Chemical Fuels

➤ Fuel-Flex	➤ Fuel-flexible combustion systems for liquid and gaseous bio fuels	➤ E-Flox GmbH ➤ Progression Industry
➤ XGaTe	➤ Extended Gasifier Technologies	➤ AVA-CO2 AG ➤ Boson SA
➤ UPGRAD	➤ Upgrading of low-rank biogenic feedstocks for heat and power production via combustion and gasification	➤ LignoGen GmbH
➤ DeMiTar	➤ Development and market implementation of PID and FID tar analyzers	➤ BTG Group B.V. ➤ Ratfisch GmbH
➤ SynCon	➤ Novel synthesis process concepts for efficient chemicals / fuel production from biomass	➤ Progression Industry ➤ Statoil ➤ Total
➤ DEBUGGER	➤ Demonstration of efficient Biomass Use for Generation of Green Energy and Recovery of Nutrients	➤ Outotec
➤ Demo SNG	➤ SNG for smart gas grids	➤ Cortus AB

Innovation Projects: Sustainable nuclear & renewable energy convergence

➤ I-SMART	➤ Innovative Sensor for Material Ageing and Radiation Testing
➤ HITTEG	➤ High Temperature Thermoelectric Generators
➤ DECODE	➤ Development of a Convergent Design tool to improve simultaneously hydrothermal and aero-thermal simulation of buildings
➤ INEPT	➤ Innovative Nuclear Experimental Platform & Training

Innovation Projects: Intelligent energy-efficient buildings and cities

➤ KIC-Ass	➤ Active Sub-Stations
➤ STORAGE	➤ Energy Storage as Necessary Part of Energy Balanced Buildings and Districts
➤ TENEEB	➤ Towards Energy Neutrality with Energy Efficient Buildings and districts
➤ EVCITY	➤ Business & service models to support the roll-out of Electric Vehicles in cities

Innovation Projects: Renewable Energy Technologies

➤ ENTHIPV	➤ Encapsulation of flexible thin film PV devices
➤ OTS	➤ Offshore Test Station
➤ OFFWIND-TECH	➤ Offshore wind enabling technology
➤ NEPTUNE	➤ Offshore Metaocean Data Measuring Equipment and Wind, Wave and Current Analysis and Forecasting Software
➤ TESCONSOL	➤ Thermal storage for concentrating solar power plants

Innovation Projects: Clean Coal Technologies

➤ NewMat	➤ New Materials for energy production
➤ CoalGas	➤ Coal Gasification Technology For High-Efficiency Fuel and Power Production
➤ SeCoal	➤ Multi-fuel energy generation for Sustainable and Efficient use of Coal
➤ ACoPP	➤ advanced near zero emission Coal fired Power Plant
➤ EGOR –CO2	➤ Enhanced Gas and Oil Recovery method

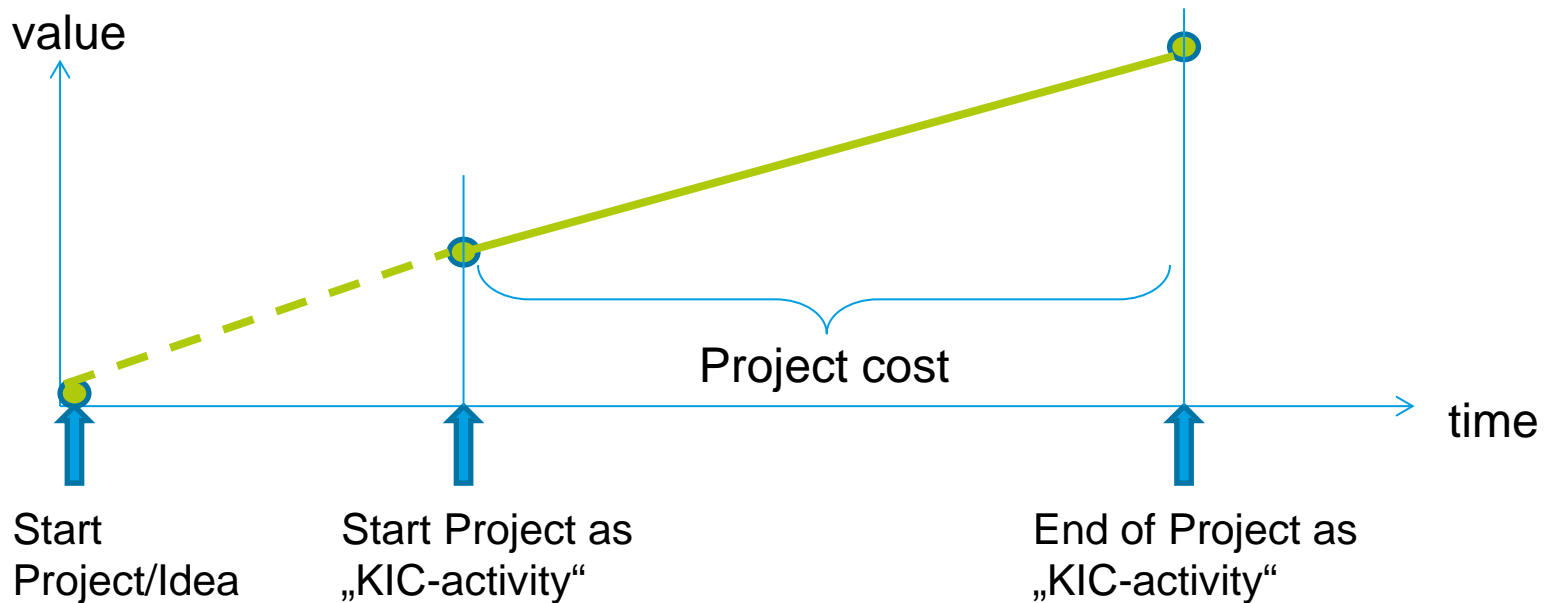
Innovation Projects: European smart electric grid and electric storage

➤ CIPOWER	➤ Controllable and Intelligent Power Components
➤ Electric Energy Storage	
➤ INSTINCT	➤ ICT solutions for active distribution networks and customer interaction
➤ Smart Grids	➤ Smart grids materials technology
➤ SMART POWER	➤ Smart Grids from Power Producers to Consumers

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Closing the gap between idea and business



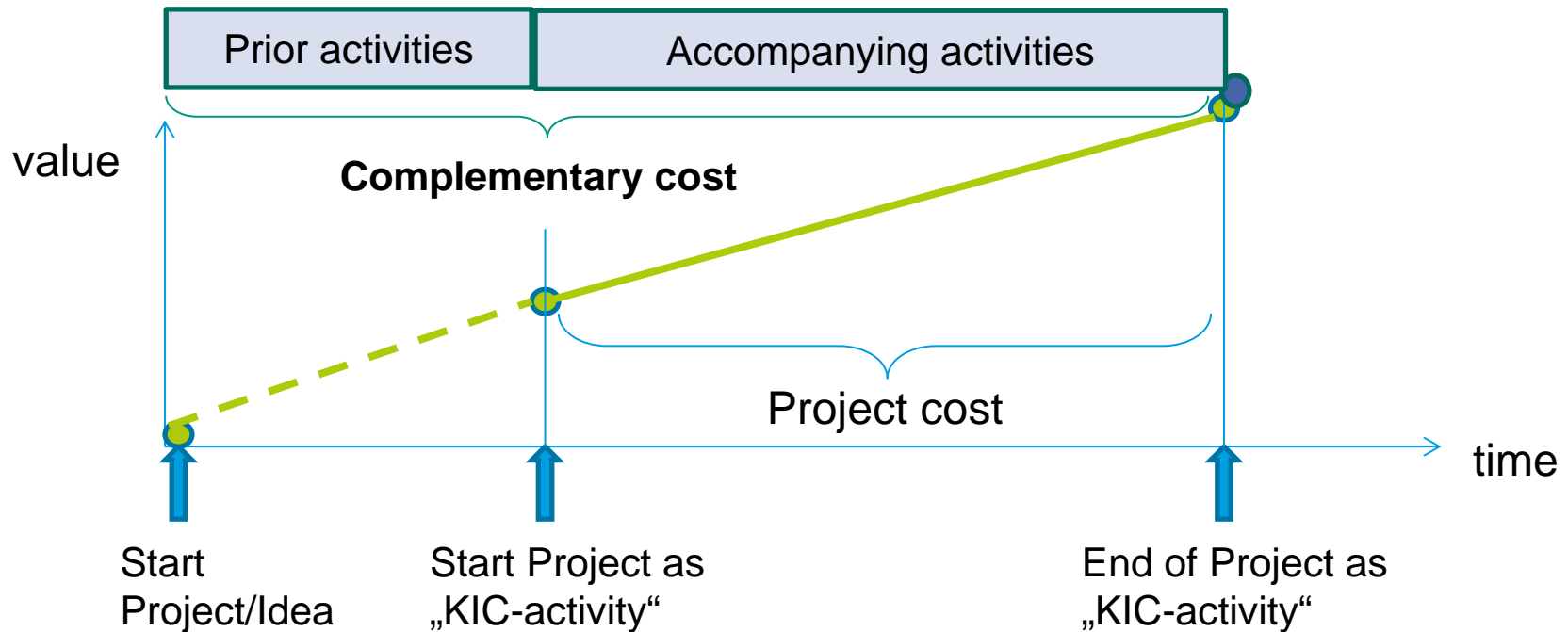
Project Cost = sum of all costs which occur to create added value between start and end of KIC activity („KAVA“)

Co-funding = contribution of own resources of partners or other sources

Project Cost -- Co-funding = GAP (to be closed by KIC IE; „eit-funding“)



Closing the gap between idea and business



Complementary Cost = sum of all costs which are complementing the activity but are not part of the Project cost

GAP (“eit-funding”)	=	25	=	1
Co-funding + Complementary costs		75		3



KIC InnoEnergy

Integration of the Knowledge Triangle

