Stairway to Excellence

Cohesion Policy and the Synergies with the
Research and Innovation Funds

Example of Synergies

The European Institute of Innovation and Technology (EIT)

Climate Knowledge and Innovation Community (Climate-KIC)

"Pioneer Cities" & "Transition Cities" Projects

International

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Executive Summary

The European Institute of Innovation and Technology (EIT)[1] is a European Union body aiming to innovate in terms of reinforcing the Union's and its Member States' capacities, creating the entrepreneurs of tomorrow and increasing European sustainable growth and competitiveness. The EIT integrates all three sides of the Knowledge Triangle (higher education, research and business) and undertakes a unique experience to foster collaboration between innovation and excellence centres with the emphasis on boosting innovation process; namely, by facilitating transition from idea to product; from lab to market; and from student to entrepreneur.

The integration of different sides of the Knowledge Triangle requires the effective transmission and sharing knowledge, information and skills as excellent researchers, students and entrepreneurs generally work in isolation with very limited connections. The EIT Knowledge and Innovation Communities (KICs) are designed to solve this problem and provide opportunities to commercialise the most up-to-date and relevant research findings. By adding higher education, businesses is able to take advantage of a workforce with skills tailored to their needs able to drive their market share forwards; and students benefit from an education that will make them more attractive to future employers and also more apt at contributing to the development of those employers' businesses.

Climate-KIC[2], which was established in 2010, is the Europe's largest public-private innovation partnership focused on climate change, consisting of more than 250 organisations including research institutions, business companies, regional agencies and public institutions.

In this fiche, two interrelated projects of Climate-KIC ("**Pioneer Cities**"[3] and "**Transition Cities**"[4]) are elaborated with respect of the sequentially (and parallel) funded projects. While the first 'pathfinder' project, Pioneer Cities (PC), aims to identify and share solutions for tackling climate change in urban areas in Europe (namely; the cities Valencia/Castellon, Bologna/Modena, Budapest, Frankfurt, Birmingham and Wroclaw), the sequential 'innovative' project (and also parallel as both projects are still active), Transition Cities (TC), aims at building integrated innovation system for the transition to a low carbon economy. The Pioneer Cities project has been co-funded by the EIT (from the dedicated budget coming from FP7 and Horizon 2020 programmes) and performed excellent scientific research and educational activities mostly at postgraduate level. The Transition Cities project has been funded by ERDF, national and private funding sources. It should be noted that these two projects were not initially designed with emphasis on the long-term funding opportunities; but, synergy was made possible due to the EIT-KIC structure and the synergies mind-set. Ultimately the projects demonstrate a good practise of combining different sources of funding to leverage the outcomes around a thematic area.

Type of synergies

- Downstream activities
- Sequential and parallel funding

S&T field targeted by the synergies

- Environment
- Energy
- New production technologies
- Various (SME support)

[1] http://eit.europa.eu/
[2] http://www.climate-kic.org/
[3] http://www.climate-kic.org/projects/pioneer-cities
[4] http://www.climate-kic.org/projects/transition-cities/

1. INTRODUCTION

This case is one of the 25 examples of synergies provided by the 'Stairway to Excellence' project in which different sources of funding have been combined to amplify the R&I investments and their impact on the economy and wider society.

As described in the guide 'Enabling synergies between European Structural and Investment Funds, Horizon 2020 and other research, innovation and competitiveness-related Union programmes[5]', synergies can be achieved through:

- Sequential (or successive) funding that use funds in separate projects built on each other;
- Parallel funding that use funds in separate projects complementing each other;
- Simultaneous/cumulative funding that brings together Horizon2020 and ESIF funds in the same project aimed at achieving greater impact (This possibility is only offered since the new multiannual financial period 2014-2020 and does not concern the examples presented by the project)
- Alternative funding that reorients FP7/Horizon 2020 projects that were positively evaluated, shortlisted, but not funded given the limited budget, towards Structural Funds impact (This possibility is only offered since the new multiannual financial period 2014-2020 for a restricted type of projects and does not concern the examples presented by the project).

The combination of sources of funding are used to cover two types of activities between the traditional research activities

- Upstream activities are building the appropriate capacities to perform research. They can be capacity building in physical capital (construction or improvement of research infrastructures, purchasing equipment, (including IT equipment and connections, data storage capacities), innovation infrastructures (LivingLabs, FabLabs, Design factories, etc.) and social capital (assistance for building networks, clusters and consortia).
- Downstream activities are leading to the market and the creation of economic value. They can be applied to research, development and demonstration activities, technology transfer and adoption; technology and innovation audits to identify potential demand for RDI results; Proof-of-concept funding; and Pilot lines for first production; pre-commercial procurement projects. It can also be activities to support the improvement of the innovation eco-system in a territory.

[5] http://s3platform.jrc.ec.europa.eu/documents/10157/267027/Guide%20on%20synergies_en.pdf

2. CONTEXT

Information on the EIT and its Knowledge and Innovation Communities (KICs)

The European Institute of Innovation and Technology (EIT) is an independent body of the European Union set up in 2008 to spur innovation and entrepreneurship across Europe to overcome some of its greatest challenges. It brings together leading higher education institutions, research labs and companies to form dynamic cross-border partnerships – Knowledge and Innovation Communities (KICs) – that develop innovative products and services, start new companies, and train a new generation of entrepreneurs.

The EIT's mission is to (i) increase European sustainable growth and competitiveness; (ii) reinforce the innovation capacity of the Union and its Member States; and (iii) create the entrepreneurs of tomorrow and prepare for the next innovative breakthroughs. The EIT also supports different levels of collaboration between innovation and excellence centres with the aim of boosting innovation process (e.g. "from idea to product", "from lab to market" and "from student to entrepreneur"). It can be noted that the EIT is the first EU initiative to fully integrate all three sides of the Knowledge Triangle (business, research, and education) by means of its Knowledge and Innovation Communities (KICs).

To bring together these actors from all mentioned environments, the EIT's first three KICs were launched in 2009, and other two in 2014. Two more KICs are planned to be launched in 2016 while another one is planned for 2018.

- Climate-KIC (2009): addressing climate change mitigation and adaptation,
- EIT Digital (2009): addressing information and Communication Technologies,
- KIC InnoEnergy (2009): addressing sustainable energy,
- EIT Health (2014): addressing sustainability of healthcare system
- EIT Raw Materials (2014): addressing attractiveness of the European raw materials sector,
- EIT Manufacturing (2016): addresses the establishment of sustainable and productive manufacturing industry,
- EIT Food (2016): addressing sustainability in supply chain from resources to costumers,
- EIT Urban Mobility (2018): addressing the sustainable ways of city mobility (even so depending on the positive outcome of the EIT Evaluation in 2017).

EIT KICs carry out a whole range of activities, covering the entire innovation value chain – including professional training and education programmes, reinforcing the journey from research to the market, innovation projects and business incubators/accelerators. They are driven by a pursuit of excellence in all of their activities and are established with the aim of reaching the necessary critical mass to achieve systemic impact, including the creation of new businesses and new jobs, and the promotion of new skills and entrepreneurial talent in the economy.

It should be noted that the EIT gives special attention to the identification and realisation of synergies with other EU funding programmes and initiatives. The Amended EIT Regulation clearly states that "*the KICs should seek synergies with relevant European Union initiatives*"[6]. In addition, the EIT Strategic Innovation Agenda addresses the analysis of potential synergies and complementarities between EIT activities and other Union initiatives and programmes.

Climate KIC, which was designated in 2009 and started its operations in 2010, is Europe's largest public-private innovation partnership focused on climate change, consisting of more than 300

[6] European Commission (2011), Regulation of the European parliament and of the Council amending Regulation EC No 294/2008 establishing EIT, COM(2011) 817 final.

partners including research institutions, business companies, regional agencies and public institutions (figure 1).

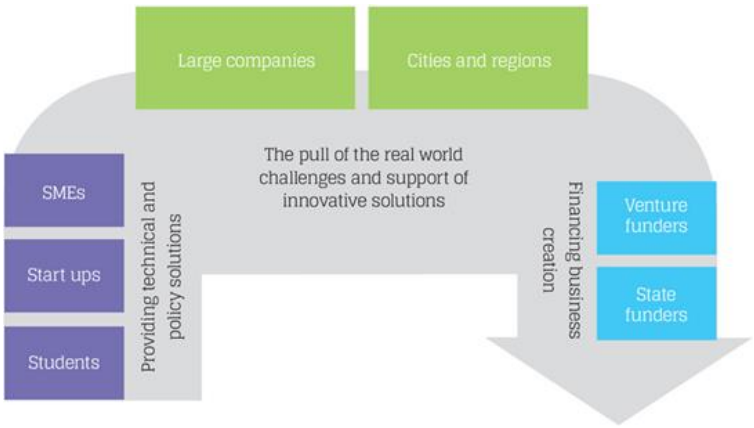

Figure 1: Structure of Climate KIC

Across Europe, Climate-KIC has six co-location centres (CLCs) or 'innovation eco-systems' led by world-class universities, research centres, companies, regional authorities, municipalities, and NGOs (The split across the sectors is approximately 50% business, 30% academic, and 20% public and not for profit). The six CLCs are based in France, Germany, the Netherlands, Sweden, the United Kingdom and Denmark (covering the Nordic countries). Additionally, the six Regional Innovation Communities (RICs) have been established in the West Midlands (UK), Emilia Romagna (Italy), Valencia (Spain), Hessen (Germany), Lower Silesia (Poland) and Central Hungary. Climate-KIC Regional Innovation Centres are led by local or regional government with a view to support the testing, implementation and scaling up of innovation[7]. In addition, together with the local partners, Climate-KIC has launched more than 60 projects to identify markets for climate mitigation and adaption innovations. They have also invested in innovation projects to create products and services and take them to market through existing businesses, new joint ventures and spin-off companies. Moreover, all Climate-KIC Regional Innovation Centres play a crucial role in the implementation of the EIT Regional Innovation Scheme (EIT RIS), the scheme to ensure wider participation in EIT activities beyond existing KICs.

The EIT Regional Innovation Scheme (EIT RIS) is a structured outreach scheme to support the integration of the Knowledge Triangle and increase the innovation capacity in areas and regions in Europe not directly benefitting from the EIT and its KICs. It is based on a two-way engagement between KICs and selected partnerships from the wider European innovation community.

The EIT RIS has been conceptualised in a way that allows for synergies and efficiency gains for regions that have been designing Smart Specialisation Strategies (RIS3) and are looking for a better integration of the Knowledge Triangle as a driver for enhanced innovation capacity at regional level. The KICs' Co-location Centres offer platforms for cross-border collaboration playing a major role in strengthening the local-global connectivity of the KIC as a whole, including through close co-operation with regional authorities, in particular those involved in designing and delivering the Regional Innovation Strategies for Smart Specialisation (RIS3).

[7] Climate KIC: Working with Cities and Regions; available at http://www.climate-kic.org/wp-content/uploads/2013/02/Working-with-Cities-and-Regions.pdf

Widespread Projects: Pioneer Cities and Transition Cities

Two interrelated projects of Climate-KIC ("Pioneer Cities"[8] and "Transition Cities"[9]) are selected to be further studied for their created synergies. While the first project, Pioneer Cities, aims to identify and share solutions for tackling climate change in urban areas in Europe, the Transition Cities project aims at building integrated innovation system for the transition to a low carbon economy. The Pioneer Cities project has been funded by the EIT[10] and performed high level scientific research and educational activities mostly at postgraduate level. The Transition Cities project was set up by using ERDF and other sources (e.g. national funding programmes and private funds). The project can also be seen as a good example to coordinate public and private beneficiaries to work together.

The Pioneer Cities project has focused on six cities and developed the analysis of Transition Clusters for each Transition City; namely, Valencia/Castellon, Bologna/Modena, Budapest, Frankfurt, Birmingham and Wroclaw in order to develop the concept and content of challenge-led carbon clusters (see table 1). The analyses are organised around the three broad cluster areas each of which will be led by two of the Transition Cities. The other four partner cities will also contribute to the analysis in each of these platform areas.

The project analysed the possibilities of creation of low emission buildings, energy demand management, local renewable energy networks, energy from waste, low emission vehicles and integrated mobility. In addition, through social network analysis, the project identified the priorities and implementations schemes. Each project has been led by the city authorities as mostly they are responsible for managing buildings, energy and mobility systems.

Broad Cluster	Lead Cities	Specific Cluster 1	Specific Cluster 2
Building	Valencia/Castellon Bologna/Modena	Low emission buildings	Energy demand management
Energy networks	Budapest Frankfurt	Cogeneration and local renewables	Energy from waste
Mobility	Birmingham Wroclaw	Low emission vehicles	Integrated mobility

Table 1: Clusters, Cities and Themes of the Pioneer Cities project

The Pioneer Cities project develops multi-actor clusters in the areas of building, energy networks and mobility in order to enable cities to articulate better their needs and challenges. This can be considered as the development of a new approach to help cities move towards a more sustainable, low carbon future and an increased market for innovative products and services. This model also includes new ways of working for leveraging the different EU and national funding programmes. Therefore, it is also expected that the dissemination of the achievements of the project could influence the policy discussion about the role of European cities as 'innovation test beds' and importance of public procurement as an innovation catalyst.

Both projects (PC and TC) have been launched under the same strategic theme of Climate KIC, *Making Transitions Happen* (MTH)[11]. MTH aims to create a low carbon culture that engages companies, communities and citizens to reduce their impact on the climate change challenges. In line with this purpose, Climate KIC addresses:

[8] For more information, see http://www.climate-kic.org/projects/pioneer-cities
[9] For more information, see http://www.climate-kic.org/projects/transition-cities
[10] EIT budget for 2014-2020 is approx. EUR 2.4 billion within a budget of almost EUR 80 billion for Horizon 2020, the EU's Framework Programme for Research and Innovation.
[11] http://www.climate-kic.org/themes/making-transitions-happen/

- Network: The KIC's network includes demonstrators and living laboratories that pioneer innovative solutions,
- Scale-up: financial tools and models to scale up innovation, such as procurement,
- Removing barriers: identifying and removing the barriers to innovation and helping to bring products or services to market quickly.

The communities under the strategic theme of MTH work cross-disciplinary and not only address technical issues, but also a number of non-technical barriers of social, institutional, financial, behavioural or regulatory nature. The activities are quite flexible, which can easily be adapted to the different scales and contribute to the transition in different levels, from a business company to regions and/or countries.

3. IMPLEMENTATION

The research findings of the "Pioneer Cities" project, which was funded by the EIT, have nourished the implementation of "Transition Cities" projects by using ERDF and as well as national and private funds where it is called "*downstream sequential and parallel funding*" in the synergy guide[12]. Thus, few major cities have begun to consolidate low carbon transition through innovation systems. The six cases[13] and core definitions can be listed as below:

1. *The Energy Fund for Business in the Emilia Romagna Region* ***–selected case–***: provided 23.7 million euros financial source for renewable energy investments through ERDF (40% of total amount) and private bank loans (60%) (Details are available on the following parts of the report).
2. *The Transition to Combined Heat and Power (CHP) in Frankfurt* ***–selected case–***: The public authorities wanted to cut energy emissions by half and reduce energy usage in buildings. CHP stations established through ERDF and 47% of the total energy demand in Frankfurt is now met by CHP (details are available on the following parts of the report).
3. *Addressing the Challenges of Birmingham's Housing Stock*: Birmingham region was dominated by the engineering, machine tool and automotive industries during the 20th century. These industries caused a swift urbanisation and concomitant environmental risks. Therewith the Birmingham City Council brought different partners together and developed an approach [known as Birmingham Energy Savers (BES)] to cut CO2 emissions[14]; to reduce the cost and level of energy used by homes and businesses; to maximise job creation and investment through capturing opportunities in the supply chain. The investment areas have been chosen through the analyses undertaken in the scope of Pioneer Cities. The programme applied 60.000 houses in the first two phases. The third phase still continues. All the phases have been co-funded by ERDF and private enterprises.
4. *Shifting the Patterns of Mobility in Wroclaw*: The number of cars in Wroclaw increased dramatically in the past 25 years; recently 380.000 cars with a population of 634.000. Therefore, considering the research undertaken before, the City Council decided to provide a faster, more efficient and user-friendly public transportation system. The €180 million project undertaken between 2008-2013 with the construction and modernization of 5.3 km of new tram tracks, 37.85 km of reconstructed tram tracks, the purchase of 26 modern low-floor trams and building several integrated interchanges; as well as over a hundred kilometres of fibre-optic cable with a central data control point and 160 km cycling network.

[12] The synergy guide is available at http://ec.europa.eu/regional_policy/sources/docgener/guides/synergy/synergies_en.pdf

[13] For more information, please see http://www.climate-kic.org/wp-content/uploads/2015/03/Climate-KIC-Transition-Cities-Report.pdf

[14] For the importance of cutting CO2 emission, please see http://co2.climate-kic.org/

5. *Tackling the Challenge of CO2 Emissions in Buildings – The Frankfurt Experience*: aiming to minimise the capital, operating environmental follow-up costs over the life-time of the buildings. For this objective the City of Frankfurt has regulated environmental measures on a vast scale with specific initiatives geared at influencing citizen behaviour. The project consists of large variety of actions i.e. the apartment blocks producing energy rather than just consuming, high level energy savings for public buildings and SMEs, training experts to support Energy Teams, establishment of integrated energy advice centre and so on. Since Frankfurt drew up its first carbon footprint in 1987, savings of approximately 8 per cent have been achieved by means of the project and EU financial sources.
6. *Changing the Mobility Paradigm – the Impact of New Bicycle Systems in Castellon and Valencia*: The City of Castellon is an innovator for promoting urban bicycle transportation. This scheme consists of a network of 49 automated bike parking stations and 350 bikes available for the public to use in the city. Overall, cycling now accounts for 4.7% of the modal share of transport journeys in Valencia. This is a significant increase compared to a few years earlier. Moreover these new cycling schemes have also been introduced in other Spanish cities; Santander, Seville, Gijon and Cordoba.

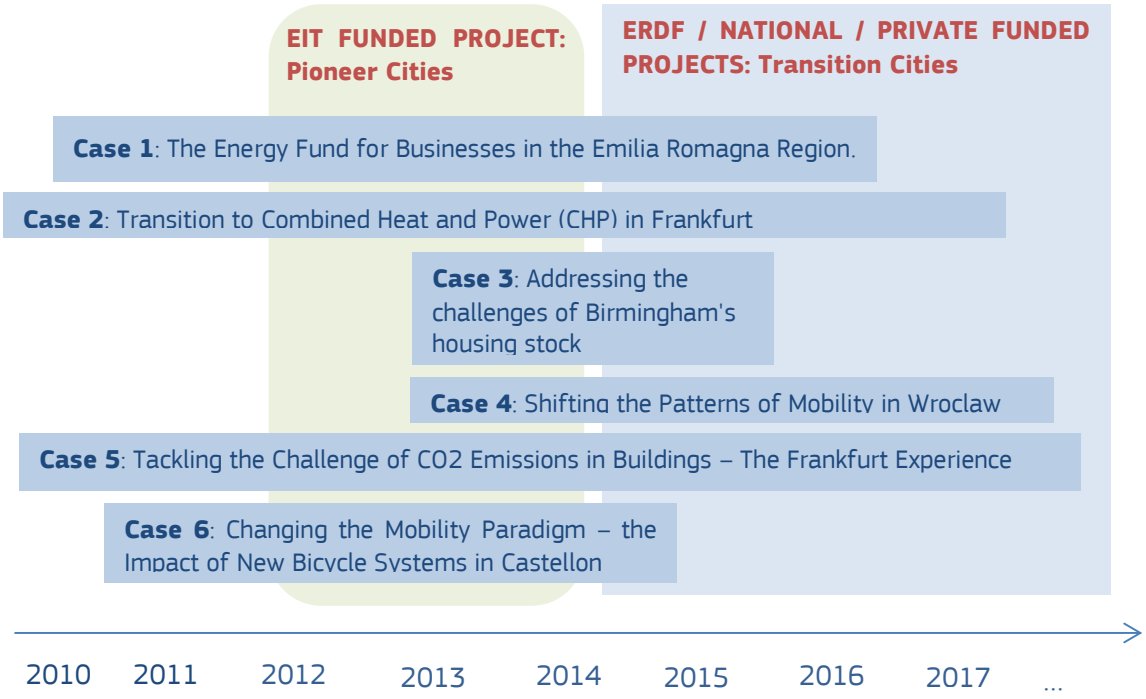

Figure 2: Diagram of chronology of the main projects involved in synergies

Figure 2 maps the project chronologically, the research activities of the organisation and the type of funding. It aims to give a picture of relations between projects revealing planned or unplanned dependencies (synergies) between projects and their source of funding.

Selected Cases Co-funded by ERDF: Emilia Romagna & Frankfurt

The Energy Fund for Businesses in the Emilia Romagna Region – Regional Operational Programme of the European Regional Development Fund (ROP-ERDF), 23.7 million Euros (40% from ERDF and %60 from private finance, 2011-2014):

The Italian region of Emilia Romagna, hosts a large number of micro, small and medium-sized industries active in the manufacturing sector. This key industry, on the one hand, has created significant economic value for the region; on the other hand, it needs to switch towards the use in

renewable industries. However the region's enterprises had difficulties to access funds for energy investment. This problem was identified as a key issue for the region by the Regional Department for Economic Activities and Sustainable Development. The solution offered by the European Structural Fund Programme. The stakeholders approved the creation of a revolving fund for soft loans in the framework of the 2007-2013 ROP-ERDF (Regional Operational Programme of the European Regional Development Fund)[15]. This financial support has been enriched by consortia whose goal is to facilitate the access to credit for economic and productive activities through collective guarantees given to the banks in case of either short or long-term loans.

The main beneficiaries of the financial support are SMEs located in Emilia Romagna. It has been intended to make energy investments with emphases on reducing energy consumption, producing innovative equipment, systems and services for the reduction of energy consumption from traditional sources and for the production of energy from renewable sources. In addition, the special Energy Fund, including the guaranteed bank loan, was designed to (1) support investments enhancing the energy efficiency, (2) produce energy from renewable sources, and (3) provide new services. Furthermore, a consortium – including two consortia Undifi and Fidindustria and so-called *Unifidi & Fidindustria Emilia Romagna* – was established to manage this special source and provide a financial guarantee. The consortium began with an initial communication campaign to raise the awareness of initiative. Afterwards it has taken central role for the selection, administration and monitoring of the funded activities. Eventually, the consortium has facilitated the access to funding, and as well as loans dedicated to SMEs to invest in energy efficiency field.

The revolving fund for soft loans started to be allocated in October 2011. The source has not only introduced for new renewable energy sources, but also promoted the setting up of new companies in the field of green economy. It should be noted that the Unifidi & Fidindustria also facilitated getting support from the banks with a backed up support of Regional Trade and Craft Association. While 9.5 million – corresponding 40% of the total amount – has been provided by ERDF 2007-2013, the remaining 60% credited by private financial partners. Moreover, a total amount of approximately 50 million euros would be allocated with a high contribution of the private banks when taking into account the new proposals.

Through four calls (three in 2013 and one in 2014), 136 projects have been submitted with an average on €348,298 for each project. The biggest shares devoted to the activities related to "biomass plants or treatments" and "PV plants". "Energy efficiency in SMEs", "hydroelectric plants" and "building energy retrofit" followed these two areas.

Transition to Combined Heat and Power (CHP) in Frankfurt – Regional Operational Programme of the European Regional Development Fund (ROP-ERDF).

One of the six cases of the Pioneer Cities project focuses on the transition to low-carbon energy sources and techniques in Frankfurt. Based on the findings of Pioneer Cities, it was decided to promote the ongoing initiative called *Energiereferat*, which is a municipal energy agency with the responsibility to enact energy policy, started to perform systematic studies on potential sites for distributed co-generation systems. Strong co-operation between *Energiereferat*[16] (founded by Frankfurt municipality in 1990 as a part of Frankfurt's environmental department) and the local utility *Mainova*[17] (the utility company has been working on district heating system since 1928) has promoted the technology, involving more and more stakeholders and made the city Germany's the Combined Heat and Power capital.

[15] For more information, please see http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=URISERV:g24234&from=EN
[16] http://www.frankfurt.de/sixcms/detail.php?id=3077
[17] https://www.mainova.de/

The Municipal Energy Agency (*Energiereferat*) aims at promoting CO2 reduction and develops an energy strategy for the city. The main tools used for this goal are Combined Heat and Power (CHP) and District Heating and Cooling (DHC), which are reliable and cost effective technologies to meet both urban heat and electricity demand and to reduce CO2 emissions at an economically feasible cost. In order to promote these tools, *Energiereferat* focuses on small schemes; starting with 13 sites with a high heat and power demand such as hospitals, public swimming pools, offices, which were selected for feasibility studies undertaken by the Pioneer Cities project. "On average, a ratio of two out of ten projects analysed in feasibility studies is actually carried out. In addition to feasibility studies for new or existing buildings, the *Energiereferat* prepares case studies on energy supply alternatives for new urban development schemes which often result in new CHP plants or connections to existing district heating areas. This process has been given the title systematic discovery planning"[18].

Frankfurt has established a friendly climate for CHP through the Structural Fund. As a result, distributed CHP generation in small and medium sized units in the city has increased from 0.1 MWel to 31.8 MWel (office buildings, swimming pools, hospitals etc.) between 1990 and 2013. In total 300 CHP plants were installed with sizes ranging from 5 kWel (kindergarten) to 4000 kWel (German Federal Bank). In other words, 47% of the total energy demand in Frankfurt is met by CHP (44% by district heating where 90% of the heat is generated by CHP and 3% in small CHP units). Among the different sectors, the residential buildings sector supplies 12% of its energy demand with CHP, industry 65% and services more than 50%. Totally 295 units have reduced the CO2 emission more than 90.000 tons per year.

Added Value Created by the Activities

The Transition Cities project has taken a critical role in reducing the CO2 emission and mobilising societal actors for collaborative actions while the synergy activities create added values and spillover impact on the activity area, society, and regional economy. The main added value effects are summarised as follows:

- The Transition Cities project merged and aligned the different regional actors including responsible public bodies, municipalities, city councils, industrial associations, chambers and business enterprises. This involvement has even changed the way of associated works and collaborations and it can be considered as an initial step to establish a new working culture.
- The new working culture creates opportunities to develop a new model that fosters cities to move towards a more sustainable, low carbon future and also signal a clearer and more coordinated intent to the market for innovative products and services.
- Through the EIT and Climate-KIC investments, networking and sharing information has been promoted systematically between stakeholders. Therefore the synergy activities enhance the mutual trust and cooperation mentality between different stakeholders, business and public bodies.
- The information dissemination raises the social awareness of the environmental issues. In addition the impact on society has become visible over time and advocated the necessity of new investment opportunities in the environmental fields.

Considering the individual projects under the Transition Cities, the project of "**Energy Fund for Business in the Emilia Romagna Region**" created distinctive value added, as well:

- One of the main results of the project is to influence the debate regarding the role of the public procurement towards more environmentally responsible place. The case of Emilia Romagna Region has achieved this through establishing a new consortium (*Unifidi &*

[18] http://www.climate-kic.org/transition-cities-study, pp. 8.

Fidindustria Emilia Romagna) and new funding/loan mechanisms that facilitate to access to financial sources for the micro, small and macro sized companies.

- Production of energy from renewable sources has been promoted through the developments of new services and productions systems that enable the reduction of energy consumption from traditional sources.
- Energy efficiency investments by enterprises have increased and new Renewable Energy System plants have been implemented.
- Setting up of new companies in the field of green economy has been promoted. Also the energy efficiency of existing companies has been further enhanced.

The value added created by the project "**Transition to Combined Heat and Power (CHP) in Frankfurt**" can be summarised as;

- The project has promoted CO2 reduction and developed a new energy strategy for the city. Following resolutions of the City Council (Energiereferat) and the local utility (Mainova), more stakeholders have been involved in the development of city strategies; and moreover, new strategies based on using renewable energies, energy supply alternatives, newer technologies and new urban development schemes commonly accepted by the stakeholders. In other words, the project has changed the mind-sets.
- As a result of this process distributed CHP generation in small and medium sized units in the city has increased from 0.1 MWel to 31.8 MWel (office buildings, swimming pools, hospitals etc.) between 1990 and 2013. There are, today, more than 300 small CHP plants with a capacity of 5 megawatts in Frankfurt. This number was 1 (one) in 1990.
- The new way of governance, which is based on the use of local authorities and their instruments to shape and coordinate the complicated collaboration issues, is developed. This new way has enabled the efficient information exchange between different stakeholders.

Mechanisms Facilitating the Synergies

There is a variety of mechanisms and instruments facilitating and promoting the synergies. A number of schemes that made the synergies happen are established through the EIT.

***Co-location Centres*:** All KIC activities are driven primarily by the co-location centres (CLC), i.e. local innovation eco-systems. Co-location Centres are the main instrument for managing KIC activities and knowledge flow. Each KIC has regional innovation hubs with partners in close proximity, and such proximity is essential to facilitate interaction among members of the regional community. CLC are the focal point for the KICs' activity in these hubs. They bring together, in one clearly specified physical location for each innovation hub (e.g. a city or town), people and teams from across the Knowledge Triangle for ideation, projects and other initiatives.

CLC build on the existing labs, offices or campuses of some of the KIC's core partners, which serve as clusters for a particular region, discipline or task. As part of the KIC's strategy, including synergies with other initiatives, the innovation capacity and potential impact of all CLCs together are greater than their individual strengths. They give the KIC critical mass on a European scale, forming a continent-spanning network that enables partners to tap into the best talent, ideas and resources.

Each of the current KICs has chosen a CLC model best suited to its strategy. Some centres have specialties in a particular field or discipline; others have horizontal skills that can help all partners. But several key functions can be seen across all CLCs:

- *Connectivity:* CLCs provide a physical space for interaction within the local ecosystem. These spaces attract a wide range of actors from within the KIC and beyond;

- *Knowledge management:* CLCs function as points for knowledge exchange (within, between and across CLCs);
- *Activity management:* CLCs act as hubs for many KIC activities.

The KICs' Co-location Centres offer platforms for cross-border collaboration playing a major role in strengthening the local-global connectivity of the KIC as a whole, including through close co-operation with regional authorities, in particular those involved in designing and delivering the Regional Innovation Strategies for Smart Specialisation (RIS3).

Moreover, *the EIT Regional Innovation Scheme (EIT RIS)*[19] has been conceptualised in a way that allows for synergies and efficiency gains for regions that have been designing Regional Innovation Strategies for Smart Specialisation and are looking for a better integration of the Knowledge Triangle as a driver for enhanced innovation capacity at regional level. With this respect, each selected EIT RIS partner and its region can benefit from the exchange of knowledge and good practices, accelerating innovation outputs, boosting regional innovation and contributing to economic growth. Furthermore, the Scheme helps KICs to get aligned with regional Operational Programmes (OPs) and access ESIF sources.

In addition to the EIT mechanisms and schemes, each project has developed mechanisms to facilitate and support synergies. In terms of our **selected cases on Emilia Romagna and Frankfurt**;

Specialised Local/Regional Actors: are established to address key issues. The special institutions to facilitate accessing the financial sources and monitoring the implementations have been established by both projects; namely of *Unifidi & Fidindustria* for the Emilia Romagna Region and *Energiereferat* for the Frankfurt Case.

A consortium *Unifidi-Fidindustria*, as a specific initiative, is composed by the two independent institutions "Unifidi" and "Fidindustria". It is a temporary association that manages the specific "Energy Fund" initiative ad interim. Unifidi is backed by regional trade and craft associations (C.N.A., Confartigianato) and has a really significant profile with 77,000 associated companies while Fidindustria is more established for larger economic sector with the composition of the industrial associations (Confindustria, Confapi) and the regional Chambers of Commerce. The consortium is led by the city council as it has a clear advantage of bringing together different stakeholders, established and intervened mutual trust, facilitate and simplify procedures. Unifidi-Fidindustria is an assurance consortium aiming at facilitating the access to financial sources through collective guarantees given to the banks for short/long-term loans.

Lastly, it should be noted that the Consortium Unifidi-Fidindustria also engaged the Climate-KIC partner the *Modena Energy Agency* (AESS)[20] in order to act as the technical adviser with the necessary specialist expertise to evaluate business proposals and to ensure alignment with the programme's main objectives. In other words Climate KIC has taken up an active role at different stages of the project, from the submitting of proposal to the evaluation through its own partner organisations.

Similar to the Bologna case, the project Transition to CHP in Frankfurt builds on the expertise of a special agency, called *Energiereferat*, which is a municipal energy agency with the responsibility to enact energy policy. Also there has been a strong co-operation between *Energiereferat* and the local utility *Mainova* since 1990. The Energy Agency took a very active role in the strategic decisions; e.g. focus on small schemes and public institutions. In addition, the agency prepared case

[19] http://eit.europa.eu/activities/outreac/eit-regional-innovation-scheme-ris
[20] http://www.aess-modena.it/en/who-we-are.html

studies on energy supply alternatives and stimulated the dialogue in the civil society around this theme. Finally the agency has successfully promoted this new approach while helping the different stakeholders to become more involved.

Financial assessment: The enterprises have to pass two financial (creditworthiness) assessments after the technical evaluation of the project. The first one carried out by Unifidi-Fidindustria; and the second one by the banks (private financial partners of the initiative).

Suggestions to improve the synergies

- As the political and organisational structures are generally quite complex, a specific organisation addresses to this complexity can be useful to facilitate synergies rather than getting involved in the 'old-fashion and rigid' administration.
- To motivate and agree with the private industries is possible in different ways. Close dialogue, timely information and creation of mutual trust are important. To build up an efficient and effective communication is only possible with a tailor-made approach.
- The debate on the different roles and responsibilities of various actors reopened the discussion on the 'entrepreneurial-driven' allocation of public resources which is a core element of any Smart Specialisation Strategy. This means that the entrepreneurial discovery process (EDP) through which entrepreneurial actors, from the public and private sector (i.e. companies, research organisations, universities and public society), would constantly guide the allocation of public resources. In essence, EDP requires not only the capacity of entrepreneurs to identify local strengths but also the ability of governments to collect and assess the information received in order to align policy measures to the selected activities.
- The role of Climate-KIC partners involved in the two projects and operating in the regions could be further enhanced towards the valorisation of research results produced within the RTOs and the local universities. Well networked KIC partners could provide practical solutions to enterprises on important issues such as how to access new knowledge created within the KIC in other regions and in a reverse approach how to procure knowledge produced within the region at KIC (European) level. Furthermore, the involvement of the KIC actors demonstrated that they can successfully translate research and innovation into the local entrepreneurial networks.
- Through the two projects there are certain attempts for emphasis on innovation spill over effects towards the SME communities. Of course this will depend among others on the ability of the steering teams of the regional Operational Programmes to facilitate further synergies to the benefit of SMEs with actors like the KICs in the near future.
- Through the mobilisation of the project actors there was a critical development of local linkages and knowledge exchanges, intra and inter-regional knowledge spill overs. In many of the cases the role of the KIC actors as components of a thematic innovation eco-system had been crucial for this success.
- The experience from the case study emphasises the importance of forward-looking synergies. For this to happen the lessons learnt focus on:
    - Continuous monitoring towards the engagement of all actors of the quadruple helix (from academia, businesses, public administrations and civil society). The EIT KIC model represents a very good example of bringing together actors from all sides of the helix.
    - Stronger collaborative leadership for innovation at local level; including especially businesses & universities but also between regional authorities, delivery partners and local actors.

- An informed & pragmatic approach to building synergies with Horizon 2020 and European Structural and Investment Funds (ESIF) where the Managing Authorities of Operational Programmes have a serious leadership role to play.

- At the same time, the case study further validated the view that continuous stimulation is needed for the efficient governance of regional innovation eco-systems. There is an increasing need to lift existing barriers at political, strategic and operational level that prevent synergies between Horizon 2020 and ESIF, especially in the current programming period where ESIF funding has to wisely lead to new ways of cooperation and not at infrastructure spending.

Main motivations in implementing the synergies

- The EIT and its KICs are the main motivation as they clearly aim to combine different funding programmes and create synergies. Encouraging synergies and complementarities between both policies and programmes is embedded in the EIT and the current KIC delivery models. The EIT and its KICs have been specifically designed to facilitate and encourage synergies within the European Innovation landscape. The guiding principle of the EIT focuses on a bottom-up approach.
- The EIT and its KICs have been set up to integrate the Knowledge Triangle (business, research and education) and to build upon the strength and capabilities of existing organisations that are active in this triangle.
- The EIT smart funding model is a natural driver for synergies. The EIT funds provide, on average, up to 25 per cent of the overall KIC budget. The remaining 75 per cent come mainly from KIC partners but also from other funding sources, including EU, national and regional funds.
- The EU Structural and Investment Fund programme create clear opportunities for both, researchers and business enterprises and offer solutions to overcome barriers.

Facilitating mechanisms for the take up of the scientific results

The mechanisms facilitating the take-up of the scientific results can also be grouped into the two groups; mechanisms provided by the EIT and mechanisms developed in the process of a specific case.

- *Pioneer Cities (EIT funded activity implemented by Climate-KIC)*: the project clearly aims to promote the close-to-market research, including bringing together different stakeholders and identifying main challenges in order to find the best way to exploit business opportunities and access new markets.
- *"Smart" Monitoring (EIT Monitoring Strategy)*: the EIT applies a monitoring process on the KICs, based on three dimensions: (i) *Strategic Planning* to ascertain that the strategy and components thereof are aligned with the EIT mission and vision, that they are implemented and produce, or have the potential to produce, the desired results and impacts efficiently and effectively. The object of monitoring and evaluations are the EIT Strategy, the KICs' strategies, and components thereof (e.g. Entrepreneurship Education, Innovation, and Knowledge Triangle Integration)., (ii) *Implementation* to ascertain that the EIT and KICs can implement performance based management for planning and implementation, that the EIT and KICs implement activities, accomplish outputs and consume budget according to planning and adjust plans in a timely manner where justified; and the KICs are on their way to become financially sustainable as set out in their respective strategies. and (iii) *Results and Impacts* to demonstrate that the EIT KIC approach adds value and creates synergies with other EU, national and local innovation initiatives, and leads to, or has a credible outlook to lead to, results and impacts in line with its mission.

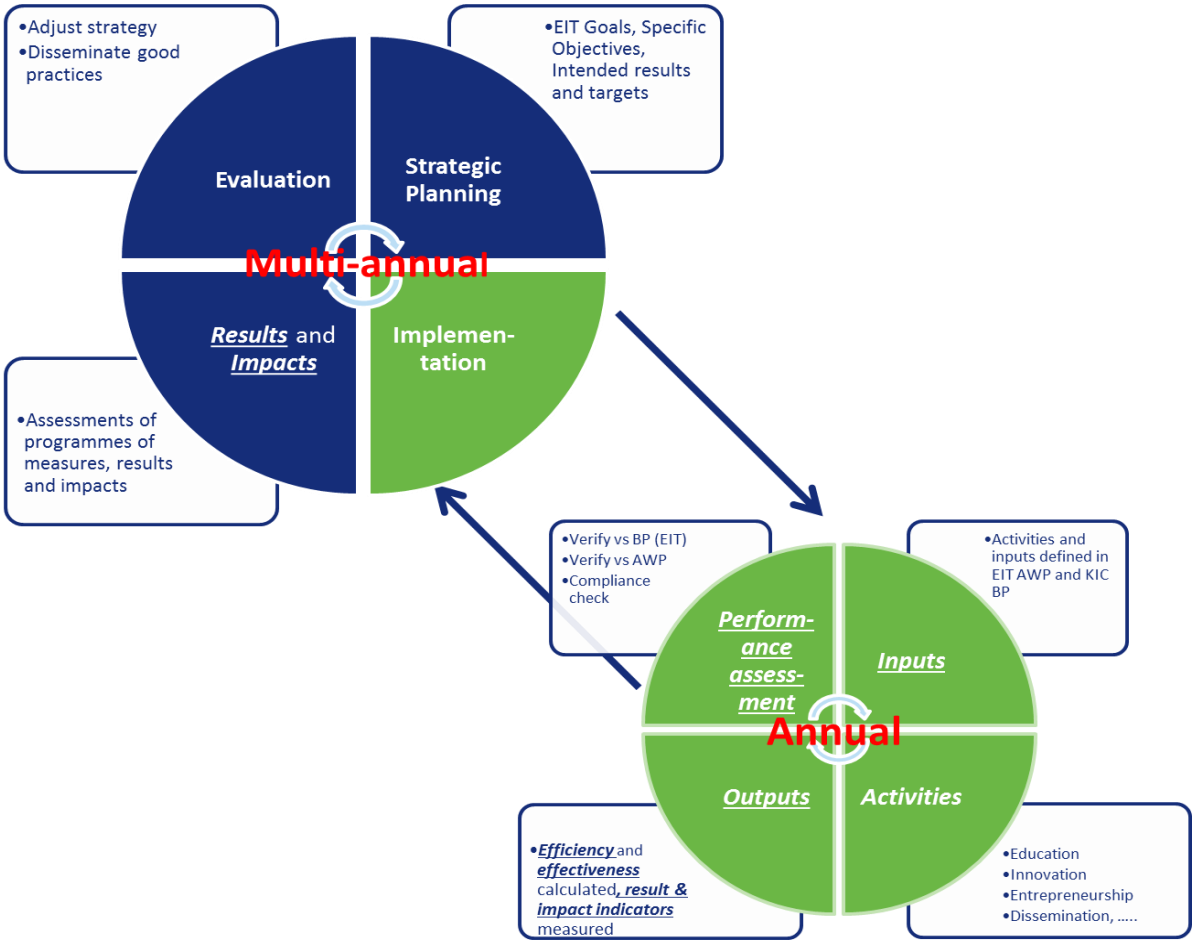

Figure 3: Monitoring and Evaluation in Perspective

- *Selection & Evaluation mechanisms (EIT instrument)*: the EIT provides a macro system suitable to each KIC and its activities, including selection and evaluation tools. All the requirements to participate in any KIC or the EIT RIS have been clearly identified; i.e. criteria based on the development of innovation capacity, scientific excellence, alignment with local authorities, policy support etc.
- *Unifidi-Fidindustria (Emilia-Romagna instrument)*: The agency has developed a system allowing getting financial support from the banks – the private financial partners of the initiative. Therefore four banks signed the agreement for providing the private supply of the loans. Furthermore the agreement between Unifidi-Fidindustria and the banks is based on defining the operative methodology for managing the whole procedure of agreeing the loans. In connection with the agreement between Unifidi-Fidindustria and private banks, fixed interest rate and stable proportion have been applied to the applicants.[21]
- *Energiereferat (Frankfurt instrument)*: The municipal agency played critical roles to bring together different scales of enterprises and regional authorities. Also it facilitated establishing a consensus on the new approach to the energy efficiency.

Impact on the regional / national economy

[21] The overall rate of interest charged to the beneficiary is equal to the weighted average of two rates: (1) For public funding portion (40% of total cost) Annual Percentage Rate (A.P.R.) has applied as 0.00% since the Third Call launched in December 2013 ; and (2) for private funding portion (60%), A.P.R. composed by the 6-months EURIBOR (previous month average) with the addition of a maximum spread of 4.75%. Therefore the overall weighted A.P.R. is equal approximately to 2.75%-3%.

- The projects have promoted the setting up of new companies and new services in the fields of green economy and energy efficiency
- The Energy Fund for Businesses in the Emilia Romagna Region has launched four calls: three in 2013 (March– April, July–November and December) and one in 2014. In the first two calls, the loan had a maximum duration of 4 years and allowed investments between €75,000 and €300,000. Starting from the third call (December 2013) the Fund was extended to a maximum duration of 7 years, and both the minimum and maximum thresholds were extended, so investments can now range from €20,000 to €1,000,000.
- Half of the projects have come from enterprises in the manufacturing sector while another 12% are coming from construction enterprises. They are mostly micro, small and medium sized enterprises, employing fewer than 10 people and with an annual turnover of less than €2 million.
- The Emilia Romagna project has funded 136 projects for a total amount of almost €50 million with an average of approximately €500 thousand.
- Fourteen biomass plants have been established in the context of the Emilia Romagna project with the amount of €12 million, 14 in rural areas, 10 in industrial sites and only one in an urban area. The project also allocated €11.8 million for the photovoltaic plants.
- The Transition to CHP project has installed electrical power of small CHP units <5 kW rose from 100kW in 1990 to 31.8 MW in 2013. The 295 units in operation reduce CO2 in Frankfurt by more than 90,000 tons per year.
- There were only one CHP in Frankfurt in 1990 with a capacity of 150 kW. Today there are 300 CHP with a capacity of 5mW. These stations are in-service at public and private places, including hospitals, swimming pools, kindergarten, public buildings (i.e. German Federal bank with a capacity of 4000kW), services and industrial areas.
- 47% of the total energy demand in Frankfurt, today, is met by CHP while 44% by district heating where 90% of the heat is generated by CHP and 3% in small CHP units. Among the different sectors, the residential buildings sector supplies 12% of its energy demand with CHP, industry 65% and services more than 50%.

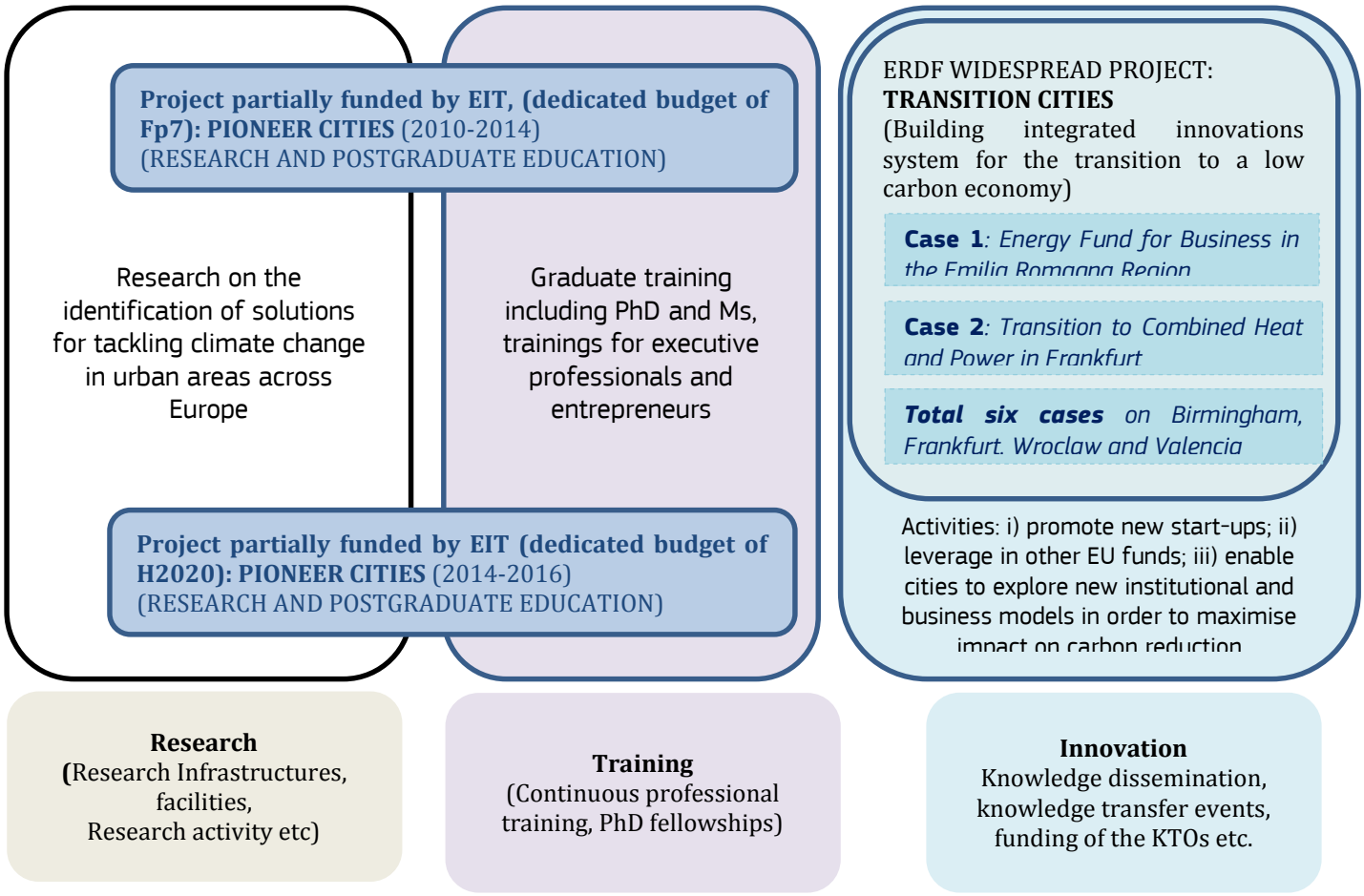

Figure 4: Diagram of the complementarities of the funds in the knowledge triangle/ flow