SMART ACTION
Innovating beyond IoT

International engagement report

D4.2.1

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Abstract

This report provides feedback on the international cooperation in the area of IoT that will play a pivotal role in delivering upon the IERC objective. In this context selecting IoT research topics and international partners for an optimal investment of resources is central to the IERC strategy. The focus of the IERC activities reported here was on international cooperation that delivers greatest impact in the areas aligned with European IoT strategic priorities and frameworks.

Specific attention was paid to follow up international activities already in place such as in China, Korea, Japan, Brazil both for IoT and Smart Cities.

In the first period we focused on establishing new platform of dialogues with important countries (e.g. USA, Korea, Japan) while strengthening dialogues with existing expert groups for instance in China.

In the 2nd period we will use all the channels established in the first period to consolidate the International road mapping, and we will report on this in D4.2.2.

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Table of Contents

List of Figures

List of Tables

1 Introduction

This task ensures that all studies and research take into account the international context, as IoT and Smart Cities are global issues.

Roadmaps, Market Analysis, research status and business deployment will be analysed from important regions such as Asia, North America , Brazil. Findings will be taken into consideration to WP2, WP3 and WP5 to consolidate their deliverables on roadmap, research programmes and policy.

This task will also address the international cooperation in the area of IoT that will play a pivotal role in delivering upon the IERC objective and will do so in an efficient and effective manner through strong collaboration between international stakeholders. “Europe cannot cooperate with all countries on all topics" and in this context selecting IoT research topics and international partners for an optimal investment of resources is central to the IERC strategy. The focus of the IERC activities will be on international cooperation that delivers greatest impact in the areas aligned with European IoT strategic priorities and frameworks. This approach will create a dynamic synergy with different global initiatives that can be exploited in the European research arena.

Specific attention will be paid to follow up international activities already in place such as in China, Korea, Japan, Brazil, both for IoT and Smart Cities.

Two international conferences will be organised to gather all international expertise and experts. Prior to the events will prepare debates.

This deliverable provides a status of the international feedback into other WP reports, and in its first version a status after 12 months (per end august 2014).

2 Global Context within H2020

2.1 New international strategy and policies

A Key Element of Horizon 2020

The importance of international cooperation in science and technology is explicitly recognised in the European Union's Innovation Union flagship initiative and the proposals for Horizon 2020, the next EU funding programme for research and innovation.

Many of our international partner countries are investing more-and-more in research and innovation, and cooperation will be vital if research is to reach its full potential. An active and more strategic international cooperation will also contribute to achieving the EU's wider policy objectives.

A New International Strategy

On 14 September 2012, the European Commission set out its new approach to international cooperation under Horizon 2020 in a Communication entitled "Enhancing and focusing EU international cooperation in research and innovation: a strategic approach" COM(2012)497. In-line with this approach, international cooperation activities developed under Horizon 2020 should contribute to the objectives of:

- Strengthening the Union's excellence and attractiveness in research and innovation and its economic and industrial competitiveness;
- Tackling global societal challenges; and,
- Supporting the Union's external policies.

The new international cooperation strategy focuses on research in areas of common interest and mutual benefit in order to achieve these objectives. To strengthen implementation, the strategy also differentiates between three country groupings:

- Industrialised and emerging economies (which will only receive funding under specific conditions);
- Enlargement and neighbourhood countries (eligible for automatic funding); and
- Developing countries (eligible for automatic funding).

2.2 H2020 priorities and roadmap

The Commission Communication 'Enhancing and focusing EU international cooperation in research and innovation: a strategic approach' called for a systematic and coherent identification of priorities for international cooperation with the EU's partner countries and regions, with a view to subsequently implementing these through activities with the necessary scale and scope, in particular in the context of Horizon 2020.

The Communication equally stressed that this strategic priority setting exercise should fully reflect the state of play in the policy dialogues between the EU and its partner countries. To ensure that international cooperation activities are developed on the basis of common interest and mutual

benefit and create win-win situations, the Communication offered four criteria for guiding the identification process. International cooperation adds value when:

- Synergies and complementarities can be created as regards research and innovation capacity;
- There are opportunities for access to new or emerging markets;
- The activities contribute to meeting the EU's international commitments, as reflected e.g. in the Millennium Development Goals;
- There are adequate legal and administrative frameworks in place to engage in cooperation, also including lessons learnt from previous cooperation.

The Communication also called on this priority setting process to be reflected in multi-annual roadmaps for international cooperation with its key partner countries and regions.

On the basis of the approach outlined above, the Commission has, since the adoption of the Communication in September 2012 and, in particular, with a view to preparing for the launch of Horizon 2020, engaged in a systematic planning of priorities for cooperation in research and innovation.

The roadmaps for international cooperation, which are included in a Staff Working Document[1], provide examples of the outcome of this priority setting exercise. For each of the partner countries and regions, they provide a full overview of the framework governing the cooperation and the current state of play as regards the cooperation, including information on the way this has been addressed in the first Horizon 2020 work programmes. Most importantly, they provide an overview of what are considered to be the priorities for future cooperation (using a medium term perspective) with the partner in question, reflecting the current state of agreement in the policy dialogue.

The outcome of this priority setting exercise, as it is reflected in the Report and the accompanying Commission Staff Working Document, has led to the inclusion of the international cooperation activities in the first Horizon 2020 work programmes 2014-15, as listed in the annexes to each of the roadmaps. It will subsequently feed into the next Strategic Programming cycles for Horizon 2020 and will allow for an earlier identification of areas where there is potential to launch ambitious international cooperation initiatives with appropriate scale and scope and for the inclusion of suitable modes of implementation in the next work programmes, thus resulting in a closer and more strategic integration of international cooperation in Horizon 2020.

[1] Commission Staff Working Document "Roadmaps for international cooperation", accompanying the document "Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions/Report on the implementation of the strategy for international cooperation in research and innovation" {COM: SWD(2014) 276}

The roadmaps give priorities and roadmaps for the 11 countries or regions, which are by alphabetic order:

1. Brazil
2. Canada
3. China
4. India
5. Japan
6. Korea
7. Russia
8. South Africa
9. USA
10. Eastern partnership countries (Armenia, Azerbaijan, Belarus, Georgia, Republic of Moldova and Ukraine)
11. Southern Mediterranean countries (Algeria, Morocco, Egypt, Israel, Jordan, Lebanon, Libya, Palestine, Tunisia and Syria)

As far as cooperation in ICT and IoT are concerned, the following chapter will provide detailed information on cooperation for 6 countries out these 11 priorities (i.e., Brazil, China, India, Japan, Korea, USA).

3 International engagement for IoT

3.1 Expected contributions and results from the International engagement

The main objective of international engagement is to consolidate the international roadmap that Smart-Action will draft.

In this context we will have to pay particular attention at

1. Global challenges as market is global such as challenges on Standardisation, ID, Governance, Interoperability, security , data protection, privacy
2. How to ensure global confidence again with ensuring necessary interoperability
3. How to ensure openness in particular with global open platforms
4. What business cases and success stories can stimulate large scale deployments
5. What common future and paths to it will the roadmap suggest

As side actions of the international engagement we will also engage international partners to:

1. Contribute to a common understanding of the opportunities and challenges of the Internet of Things (IOT) for the two parties and relevant stakeholders.
2. Identify common understanding and promote join statements
3. Identify relevant IOT applications of common interest
4. Identify the necessary and facilitate common research initiatives and proposals on IOT.
5. Contribute to strategic considerations on IOT international governance, standardisation and cooperation.
6. Provide liaison with IOT industries and projects in both regions and in particular promote cross-fertilization between current projects
7. Coordinate with relevant programmes to get further support for common cooperation in particular on
8. Promote exchange between researchers

As organising international engagement requires time and resources we will work through a two steps approach:

1. M1-M12 at first period: to establish the liaison when not efficient set up and collect information in the IoT areas.
2. M12-M24 at second period : use the channels established to interact with international partners and consolidate a common vision on the international roadmap

3.2 List of countries for International IoT engagement and working methods

As the resources are limited within IERC and Smart Action it will be impossible to follow all the world countries. Considering international partners within the IERC portfolio of projects, Smart Action decided to engage dialogues with a set of important countries either :

- through IERC project and key nominated person acting as liaison
- through direct Smart Action actions when there is no IERC project or person to help

An initial list of 6 countries where identified by IERC at IERC meetings but match also the H2020 priorities for international cooperation (see 2.2)

3 countries to be managed through a particular IERC appointed person:

- **Korea** with Raffaelle Giaffreda, Create-net working within iCORE project
- **Japan** with Gurgen Levent, CEA working within CLOUT project and more recently H2020 Festival project
- **Brazil** with Pedro Malo, Uninova working within former Probe-IT and in regular liaison with IoT association in Brazil.

3 countries directly managed by Smart-Action expert **CHINA, TAIWAN, USA**.

Few other countries are considered when opportunities arise and this is the case with **South-East Asia** thanks to the Connect2sea project , and **India** thanks to IoT Forum.

The focus of the IERC activities will be on international cooperation that delivers greatest impact in the areas aligned with European IoT strategic priorities and frameworks.

3.3 USA

3.3.1 Context of EU-USA cooperation[2]

The United States of America (US) are a long standing partner of the European Union, with the relations being formalised in 1990 with the adoption of the Transatlantic Declaration. Following the 2007 US-EU Summit, a Declaration on Enhancing Transatlantic Economic Integration and Growth laid the foundation for a growth driven agenda of dialogue. Since then, the Transatlantic Economic Council has become the primary forum for economic dialogue between the EU and the US. On 13 February 2013, the EU and US announced the launch of negotiations on a Transatlantic Trade and Investment Partnership (TTIP).

The cooperation between the EU and the US on research and innovation is governed by the Agreement for Scientific and Technological Cooperation, which was originally signed in 1998 and renewed thrice for 5 years each time. In June 2013, the Commission published an independent

[2] Context from EC document "Roadmaps for international cooperation", COM(2014) 567 final and related document SWD(2014) 276 final

review of the current agreement[3]. Euratom and USA signed the bilateral cooperation Agreement on fusion energy research in 2001. USA together with Euratom is member of the ITER project. In fission Euratom and USA signed two Technical Exchange and Cooperation Arrangements, one on Nuclear related Technology research and one on Nuclear safety research. Both sides are members of the generation IV International Forum (GIF).

In 2011 R&D intensity was estimated at 2.77% GDP (up from 2.69% in 2007) against the objective of going beyond 3%[4]. The share of private sector R&D (of GERD) was 60% and the share of public sector R&D (of GERD) 33.4%.

As regards the Science Budget for the financial year 2014, an agreement reached by the US Congress in December 2013 has eased the 5% cut in across-the-board federal spending (known as sequestration). This provides a boost to research and innovation-related spending by a number of government departments and agencies over 2013 levels. For example the National Science Foundation (NSF) will receive $1.71bn (a 4.2% increase), the Department of Energy Office of Science will receive $50.7bn (a 9.7% increase) and the National Institute of Standards and Technology (NIST) gets a 10.4% increase to $850m.

While the increases undo the effects of sequestration for some agencies, they do not allow the fulfilment of the Administration's wish to follow a funding trajectory to double investment in science over a decade.

Cooperation between the USA and the EU on research and innovation

As of February 2014, US entities participated 486 times in FP7 signed grant agreements, receiving a total EU contribution of EUR 76.4 million. This despite the fact that participants from the US (as an industrialised country) did not automatically receive funding from FP7, except in the Health theme of the Cooperation Programme.

The distribution of the US participation (by total cost of US participants) over the different FP7 subprogrammes is shown in Figure 1.

1383 USA researchers have been funded through the Marie Curie Actions (2007-2013) and USA institutions have participated in 932 projects.

There is an on-going FP7 project, BILAT EU-US, which is tasked to examine areas related to the framework conditions for cooperation (e.g. Intellectual Property, funding of US participants, contractual issues, financial and reporting issues including auditing, rules for participation, cooperation schemes, knowledge on innovation and technology transfer, transatlantic mobility).

[3] http://ec.europa.eu/research/iscp/pdf/evaluation-eu-us-agreement-st.pdf
[4] Erawatch Country Overview – United States (updated 25 September 2013)

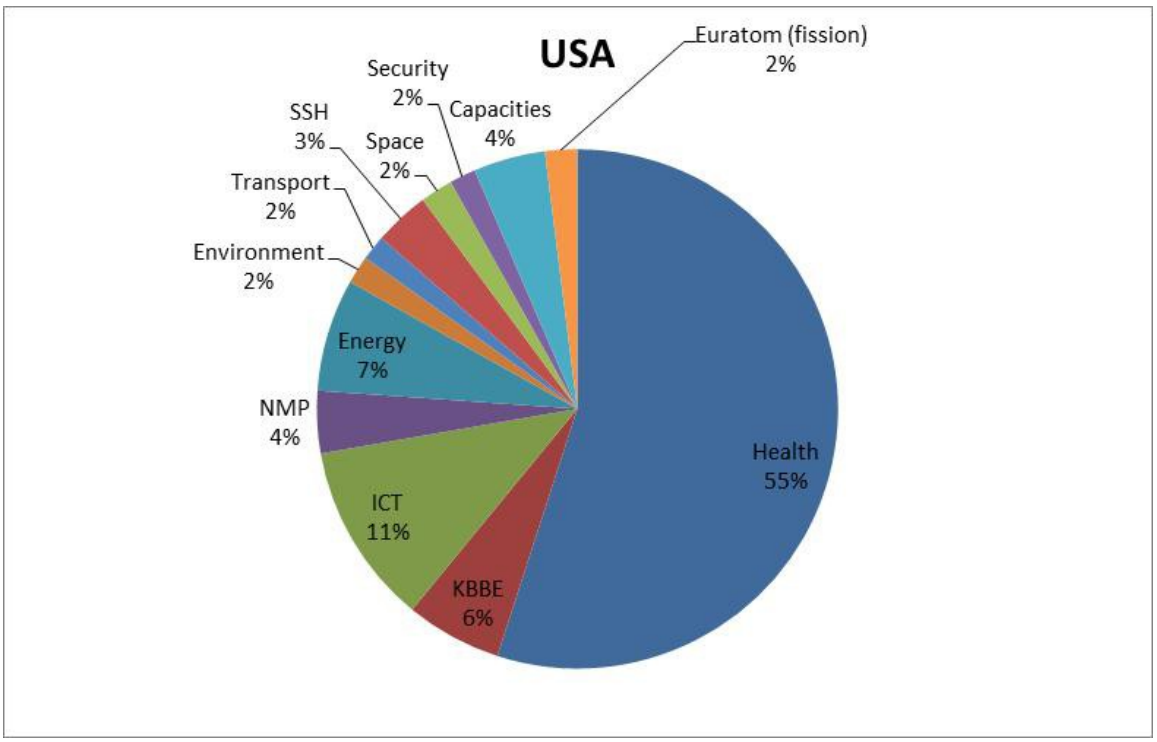

Figure 1: Distribution of US participation over FP7 subprogrammes (Source: EC working document SWD(2014) 276 final)

3.3.2 Smart Action action to set up international engagement with USA in IoT

Despite many contacts and interactions with USA in the internet of things, there was not a structured liaison. In this particular context, **the first action in the first period for the project was to establish a liaison leading to set up an EU-US IoT expert group**..

We decided to organise an EU-US workshop at one of the important IoT conference. We organised then on 8th October at Cambridge collocated with IoT conference 2014 (www.iot-conference.org) a successful workshop.

Figure 2: EU-US workshop banner

We look at support and background expertise and we got help from the EU-US Bilat 2.0 project (http://www.euussciencetechnology.eu).

The workshop was announced here:

http://www.iot-conference.org/iot2014/workshop-on-promoting-global-iot-success-stories/

EU/US Workshop: Promoting Global IoT Success Stories

Wednesday October 8th 3:30PM

Analysts predict that new Internet of Things (IoT) products and services will grow exponentially in the next years. There are more and more reports giving evidence on the growing importance of the role internet of things will play driving our future smart lives (in transport, energy, health, environment, cities). Additionally, many SMEs and large market stakeholders are working on Internet of things and expected applications as bringing promising booming businesses.

Nevertheless, there are many factors which keep the global market fragmented, and which slow down the expected rapid growth of these new business activities. This workshop aims to explore important topics, which have to be addressed by important actors on the US and the EU side to support a truly global market. The workshop brings together leaders in the IT community with the purpose of initiating a policy framework where industry can express the challenges and limitations they perceive with regard to the current policy.

The proposed outcomes of the workshop will be to:

- Identify few areas of common interest where cooperation can be established at the level of policy,
- Provide room for policy discussions
- Research or operational real market-driven projects like open platforms stimulating IoT ecosystems.

Figure 3: EU-US workshop announcement

More information and feedback on the outcome of the workshop will be given in the version 2 of the report.

3.4 Asia

3.4.1 China

3.4.1.1 The EU-China cooperation context[5]

China, as is widely recognised, has made major progress in science and technology. Indeed, China's research and development expenditure has been increasing since the 1990s, allowing the country to become, in 2005, the second largest investor in research and development in the world. However, the overall level of scientific and technological development in China could still be improved. Chinese research policy is currently based on two main documents: *the Medium- and Long-term*

[5] Context from EC document "Roadmaps for international cooperation", COM(2014) 567 final and related document SWD(2014) 276 final

National plan for Science and Technology Development 2006-2020 (policy guidelines) and *China's National S&T Development Plan for the 12th Five-Year Period 2011-2015* (implementing measures).

The medium and long-term plan represents the Chinese science and technology strategy for the first 20 years of the 21st century, in which promoting scientific and technological development in selected key fields, and enhancing innovation capacities are the two main priorities.

The five-year development plan sets out the goals for scientific and technological development. It proposes the realisation of a national innovation system, highlights the role of innovation as a driving force for development, and underlines the importance of enhancing independent innovation capacities.

The EU and China set up a high level people-to-people dialogue in May 2012 and during the September 2012 EU-China Summit, the creation of a new High level Dialogue on Innovation cooperation.

The EU's 2013 research work programme includes a coordinated call with China (for €5 million) on biomaterials.

The roadmap and priorities confirmed important of ICT and Internet of things : "*Rapidly increasing wireless-traffic and applications pose challenges for both Europe and China. International collaborative research in the next 5 to 10 years will be key to developing the next generation of telecommunications. Cooperation involving industry and research institutes on information and communication technology will be enhanced through existing and further mechanisms. Key topics such as the next generation of network and communications infrastructure (5G), smart cities and* ***internet of things*** *will be explored.*"

3.4.1.2 Project actions in the EU-China cooperation

Cooperation on IoT between EU and China started already in 2011 when an MoU was drafted between EC and CATR (China Academy and Telecom and Research) and an EU-China IoT advisory group of experts was set up. Since February 2011, 6 face-to-face meetings have been organised complementing regular teleconferences and exchanges through emails.

Over the years, we see a step-by-step developing confidence, which lead to more efficiency today. Whereas in 2011-2012 of the emphasis was on confidence building and creating relationships, in 2013 and 2014 the cooperation came in full motion.

We can notice that today we have much more information on what is happening in China related to IoT, policies or research activities but more important we have establish a trusted channel which allow us to get quickly and efficiently the information we might need.

Today the group is active along 3 parallel objectives with corresponding activities which can be summarized as follows:

	Objectives	Current actions 2014-2015
1	Strengthening cooperation using cooperation programme in EU and China in view of reciprocity of actions and benefits	• Activities within PDSF programme (eg Smart City) • Preparation of proposal submission with EU partners to coming MoST call for proposals • Activity to involve more industry support by EUCTP
2	Defining important common statements on global IoT issues	• Common statement and join white paper on IoT identification in preparation • Common statement on Architecture Reference Model) in preparation
3	Developing confidence and mutual understanding by cross participation to projects and operational activities	• Projects match-making exercice started • Cooperation on IoT test beds initiated • Growing participation to EU IoT events

Table 1: Objectives and activities in EU-China cooperation

We use this trusted relationship to consolidate the feedback in view of the coming International roadmap.

Smart Action helped in the implementation of this cooperation with :

- The preparation and support of the 7th EU-China IoT meeting in June 2014 at IoT week London
- The support of a dedicated Workshop on EU-China IoT at IoT week, June London and organised by CHOICE project. See more here http://euchina-ict.eu/eu-china-thematic-workshop-internet-things/
- The support of the EU-China discussion leading to 2 position papers on Identifiers and Architecture reference model (ARM)
- The support of the application to the EU-China Trade programme for EU-China cooperation in IoT involving the industry
- The preparation and support of the 8th EU-China cooperation meeting in Shanghai to be scheduled on 29th October
- The preparation and support of 4 IoT cooperation accelerators in Smart City, Food safety and agrifood , eHealth, transportation

Figure 4: Flyer of the EU-China IoT workshop organized by Choice project, 19 June 2014

Figure 5: Pictures of speakers at EU-China IoT workshop, London 19 June 2014

Figure 6: Promotion at EU delegation Beijing, of the EU-China IoT events in Shanghai end October 2014

Figure 7: Flyer to invite experts in EU-China IoT cooperation accelerators events, Shanghai 28-30 October 2014

3.4.2 Korea

3.4.2.1 Context of EU-Korea cooperation[6]

EU-Korean relations are based on the Framework Agreement (which entered into force on 1 June 2014). The Republic of Korea (ROK) is the only country with whom the EU has signed a Framework Agreement (in 2010), a Free Trade Agreement (in 2011) and a Crisis Management Agreement (23 May 2014).

Cooperation between Korea and the EU on research and innovation is governed by the Agreement for Scientific and Technological Cooperation, which came into force in 2007. In 2013, the Commission published an independent Review of this S&T Agreement. In fusion research, Euratom and Korea are parties to the ITER International Agreement and have bilateral cooperation agreement on fusion energy, in force since 2006. In fission research, Euratom and Korea are signatories to the Generation IV International Forum (GIF).

In 2013, Korea joined the USA as the most innovative country in the Innovation Union Scoreboard. In 2012, Korea had the 2nd highest gross domestic expenditure on R&D (GERD) globally, at over 4% of GDP. In 2010, 72% of GERD was funded by industry, 27% by government and 0.2% from abroad.

At the 7th EU-ROK Summit in Brussels on 8 November 2013, a Joint Declaration commemorating 50 years of diplomatic relations was adopted and the summit set out a vision for future development, with focus on cooperation in research, high education and industry.

As of February 2014, Korean entities participated 65 times in FP7 signed grant agreements, receiving a total EU contribution of EUR 1.9 million. The distribution of the Korean participation (by total cost of Korean participants) over the different FP7 subprogrammes is shown in Figure 8.

153 Korean researchers have been funded through the Marie Curie Actions (2007-2013) and Korean institutions have participated in 14 projects.

A support action FP7 project, KONNECT is helping the coordination of specific activities, such as networking events by thematic area, twinning events, training of National Contact Points (NCPs) and preparation of strategic reports – in synergy with the Joint S&T Committee.

Korea has been targeted as a partner for cooperation in the Horizon 2020 work programme 2014-2015, with topics encouraging cooperation with Korean researchers in areas such as 5G network infrastructures, nanosafety, factories of the future and animal health.

Work is on-going to strengthen the synergies between the EU's cooperation with Korea and the activities of the Member States (MS), as MS consider cooperation with Korea as economically important.

In the period of the Euratom FP7 and FP7+2 (i.e. 2007-2013) there have been 5 Korean participations in Fission projects, while the number of bilateral Fusion collaborative activities have reached about 35 collaborative activities.

[6] Context from EC document "Roadmaps for international cooperation", COM(2014) 567 final and related document SWD(2014) 276 final

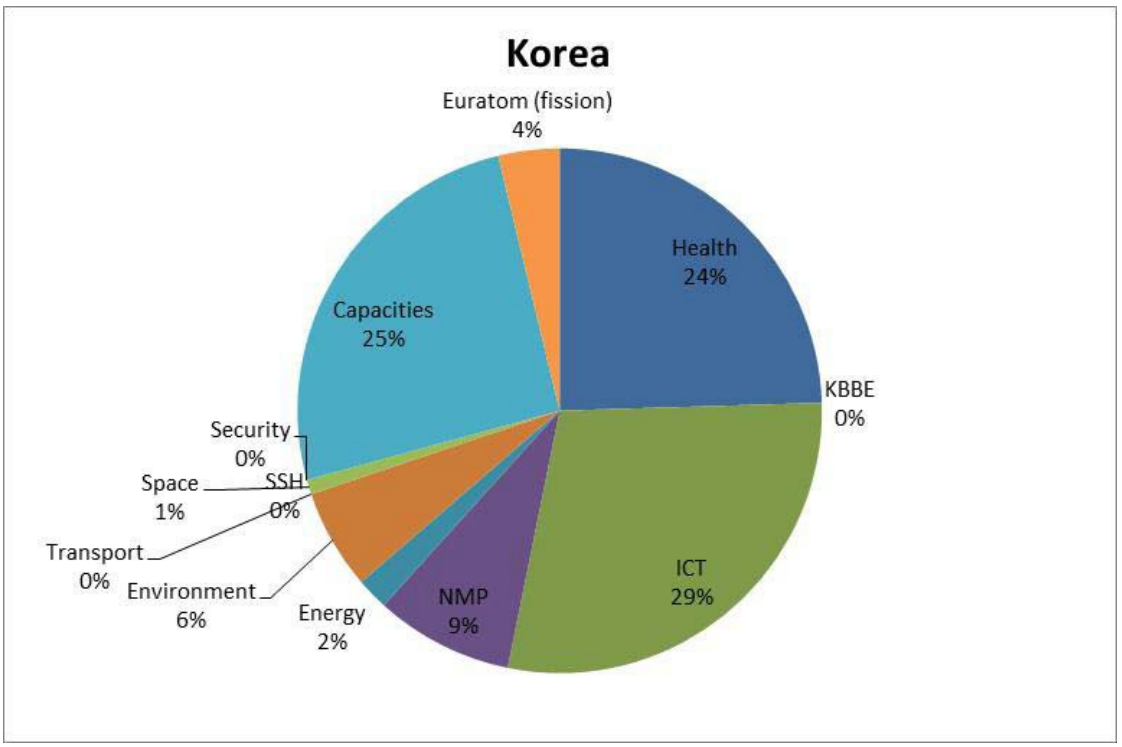

Figure 8: Distribution of Korean participation over different FP7 subprogrammes (Source: EC working document SWD(2014) 276 final)

As regards framework conditions for cooperation, South Korea has strengths in many aspects. These include a sustained technology-based economic development, a national consensus on the importance of science, technology and innovation as drivers of future socioeconomic growth, high levels of GERD and BERD, a highly educated labour force, supportive and improving framework conditions for innovation, large firms that are internationally competitive, capability to produce talent and strong ICT infrastructure. The EU and Korea are important trading partners. European companies are the largest investors in South Korea. South Korea is the EU's tenth largest trade partner and the EU is South Korea's fourth largest export destination (after China, Japan and USA).

Framework conditions for cooperation in research and innovation with Korea have been improving in recent years, particularly since the signing of the FTA with the EU in 2011, which has led to a level playing field in the areas of IPR and market access.

An example of a further positive effect of the FTA is the decreased reports by EU enterprises based in Korea of framework related issues to the EU Chamber of Commerce in Korea.

This improvement of framework conditions builds on the Korean government's increased investment in public R&D budgets since the late 1990s and improved framework conditions for Korean start-ups and tech-based SMEs (such as government-backed venture funds, tax waivers, military service exemptions for researchers).

The Third Science and Technology Basic Plan (2013-2017) aims to increase the contributions of R&D to economic growth from 35.4% to 40% through a 'Creative Economy Strategy' to support cutting edge innovation, including in SMEs and fostering high value services to drive a knowledge-based economy. This comprises enhancement and high efficacy of national R&D investment, including

strengthening basic research in Korea; development of national strategic technology; strengthening long-term creative capability; supporting creation of new industry and creation of new jobs.

However, some issues still remain to be improved, such as the access to Public Procurement by European enterprises in South Korea, where calls are often only open for a short period.

Also improved access to research and innovation funding calls for EU SMEs based in Korea would increase their R&I activities. Reciprocity of access to such funding calls should be a continued target for these enterprises based in South Korea.

ICT:

The identification of areas of mutual interest has been further deepened with the realisation of a joint workshop in Seoul in October 2013 with the participation of more than 50 experts from EU and Korea. This workshop reviewed the topics for cooperation in the areas of 5G, cloud computing, **Internet of Things** and Future Internet. This potential for cooperation was reaffirmed at the EU-Korea Summit held in November 2013. It resulted in a joint declaration, during the visit to Korea of Vice-president Neelie Kroes in June 2014, where EU and Korea agreed to work together in the future generation of communication networks (5G), related global standards and interoperability and spectrum policy. This was accompanied by the signature of a Memorandum of Understanding between the EU and Korean industry associations representing 5G stakeholders, respectively, 5G Forum and 5G Public Private Partnership. Korea is already one of the countries targeted by research and innovation in new network infrastructures for Future Internet which includes 5G in work-programme 2014-15 of Horizon 2020. The more recent developments are expected to result in the inclusion, as part of work-programme

2016-17, of a coordinated call EU-Korea addressing the topics above. There have been also expressions of interest to explore opportunities for cooperation in cyber-security, demographic change and ageing society as well as the ICT aspects of smart cities dealing with mobility, security, energy and other utility services.

3.4.2.2 Project actions for the EU-Korea cooperation

Coordination of the international engagement for Korea is organised through Raffele Giafreda CREATE-NET , Italy coordinator FP7 ICORE project

Research and Innovation in Korea is managed by the MSIP Ministry of Science, ICT and Future Planning. Within this ministry there is a unit entirely dedicated to IoT matters. Dr. Hyunje Park was appointed as the person responsible for managing Korean government investment in the IoT domain, which in Korea is being considered as a very important area to invest in.

Some IoT initiatives and projects in Korea

There exists a Reference Architecture for Korean IoT, produced as outcome of projects

COMUS – (**Common Open seMantic Usn Service platform** – 4 yrs project running till end of 2014) and COWEB (**COllaborative WEB of Things platform** – 3yrs project running till end of 2015) on IoT Platforms.

EU-Korea cooperation in IoT

Potential EU-Korea collaborations in the domain of IoT has been assessed to be beneficial. In a nutshell the identified scope is related to the wide consumer electronics industry and advanced broadband smart-cities testbeds and large-scale pilots (i.e. advanced ICT infrastructure and strength in Applications) from the Korean side while the value from European collaboration for Korea would related to diversity, i.e. have opportunities for joint assessment of IoT-services and solutions (leveraging also on EU strength in fundamental technology) over a wider (though lower on average compared to Korean standards) infrastructural spectrum of resource availability.

List of meetings and exchange (2013-2014)

- 30 September 2013: EU-Korea workshop – Seoul, whole session dedicated to IoT with EU and Korean delegations presenting activities in the field.
- March 2014: WF-IOT – Seoul, Meeting R. Giaffreda (CREATE-NET, representing the EU), Yong-Woon Kim (ETRI) and Dr. Hyunje Park (MSIP)
- 19 June 2014: IoT Week – London
    - Participants EU: Thibaut Kleiner (EC), Peter Friess (EC), Raffaele Giaffreda (CREATE-NET), Ovidiu Vermesan (Sintef)
    - Participants KR: Hyunje Park (MSIP), Dongman Lee (KAIST), Yong-Woon Kim (ETRI), Marie Kim (ETRI), Yong-Geun Hong (ETRI), Jindae Kim (NIA)

Cooperation in projects

- iCore, collaboration with KAIST, IOT6 Collaboration with KAIST

Status of cooperation and achievements

Joint dissemination activities have been carried out in the context of respective projects. iCore tutorial was given at KAIST (by R. Giaffreda to Prof. Dongman Lee department) on 5th March 2014.

Conclusion and foreseen actions on next period (2015)

There has been through the past year a fruitful exchange of knowledge fuelled by the intention of collaboration and the prospect of a joint EU-Korea call to be included in the 2016-17 workprogramme. Following the latest meeting in London at IoT Week, a number of actins have been agreed, namely to proceed in a common direction related to a Reference Architecture for IoT, assess how to best leverage on Korean large pilots. Collaboration talks are due to resume in October 2014.

3.4.3 Japan

3.4.3.1 Context of EU-Japan cooperation[7]

EU-Japan relations have developed steadily over the past two decades. Sharing many of the same challenges (energy security, access to critical raw materials, ageing populations), and defending a similar approach to key international challenges such as security and climate change, Japan is in

[7] Context from EC document "Roadmaps for international cooperation", COM(2014) 567 final and related document SWD(2014) 276 final

many ways one of Europe's closest partner on the international stage. The 22nd EU-Japan Summit (7 May 2014) entitled "EU and Japan Acting Together for Global Peace and Prosperity" reiterated EU and Japan's "strong, longstanding relationship founded on the common values of democracy, the rule of law, human rights, and shared principles such as open markets and a rules-based international system".

While trade and investment remain the anchor, a wide range of dialogues and cooperation programmes are taking place in other areas. In particular, Japan has developed stronger political cooperation with the EU and is closely aligned with Europe on key issues including regional security (Ukraine, Iran, North Korea, South China Sea, etc.) and development goals (in particular, cooperation with Africa).

At the centre of the EU-Japan agenda are the twin negotiations launched in April 2013 on a Free Trade Agreement (FTA) and on a wider Strategic Partnership Agreement (SPA) covering political dialogue, cooperation in addressing regional and global challenges, and sectoral cooperation (including science and technology). As regards the SPA, four rounds of negotiations have taken place, starting from widely different philosophies. While the EU aimed at an ambitious and comprehensive agreement listing concrete cooperation objectives for the medium and long term, Japan's initial objective, in contrast, was for a more generic and 'minimalist' political declaration. Japan also gave top priority to the FTA, resisting the proposed linkage with the SPA. Both sides are now steering towards a middle ground, moving, in particular, towards an agreement to closely link the FTA and the SPA.

Negotiations have proceeded on the FTA, addressing a wide range of issues related to market access for goods, services and investment, procurement (including railways), and non-tariff measures. The May 2014 Summit noted the progress achieved in the area of trade in goods, with remaining issues still to be solved in other areas (procurement, services, FDI). The 6th round of negotiations in July 2014 marked the beginning of a second phase in the negotiations, following the 'one-year-on' progress review by the EU.

Japan is a global leader in science and technology, as witnessed, *inter alia*, by ten Nobel Prize winners in the 2001-2012 period. Gross expenditure on R&D (GERD) was 3.7% GDP in 2013 and the long–term goal of 4% remains. In addition to significant expenditure by government, industry dominates the Japanese R&D landscape, accounting for over 75% of Japanese R&D investments. However, the last two years have been marked by a decline in government S&T funding, including in the budgets for international cooperation initiatives.

Japan traditionally performs well in innovation rankings, immediately below the US and above the EU average. However, recent scoreboards document a decline in Japan's macroeconomic indicators for innovation, e.g. the 2013 *European Scoreboard on Innovation* puts South Korea well ahead of Japan.

Cooperation between the EU and Japan in research and innovation is governed by the 2011 Agreement on Scientific and Technological Cooperation. The EU-Japan Joint S&T Committee established under this Agreement has met twice (June 2011 and June 2013) to identify priorities for cooperation. Despite the EU's insistence to keep a yearly rhythm, the next meeting of the Joint Committee is scheduled only for March 2015 In addition to the Joint S&T Committee, the 21st

Summit in November 2013 mandated the setting up of a task force of senior officials to look at concrete ways to bring EU-Japan cooperation in research and innovation to its 'full potential'. This task force held its first meeting on 15 April 2014 in Tokyo. The joint report of the meeting was submitted, as requested, to the 22nd Summit on 7 May 2014. The work of the task force was formally recognised in the Summit conclusions, which also recommended that this high-level group should continue its work "to explore more effective and efficient mechanisms to enhance future research cooperation

Framework Conditions for research and innovation with Japan are good, as could be expected from one of the world's leading scientific 'powerhouses'. As a WTO and OECD member, Japan offers a predictable legal framework, in particular regarding IPR protection.

However, despite this framework, non-tariff barriers remain, particularly in the area of public procurement. As underlined by the current FTA negotiations and by a recent report by the EU-Japan Centre for Industrial Cooperation, EU companies encounter barriers both for large technology contracts where big Japanese *kereitsu* have a *de facto* monopoly (e.g. supercomputers, high speed trains), as well as for smaller contracts. Reasons include: a high degree of diversity in administrative procedures, often specific to individual procuring entities and the types of contract; little or no information in foreign languages; absence of published tender evaluation and negotiation methods. As a result, EU-supplied goods and services only accounted for 2.9% of total procurement value in 2011.

In the area of standards, the Japanese system also tends to favour insiders. Japanese Industrial Standards (JIS) are used in tender requirements and have been usually developed by domestic industrial associations. Foreign suppliers are forced to verify separately whether their products meet these standards, thus adding to extra time and costs when preparing a bid. Excessive use of standards, and last minute changes in standards, are also utilised to keep out foreign competition. A closer harmonisation of standards, called for by the EU-Japan Business Round Table, and discussed in the context of the FTA, would no doubt be beneficial for both sides.

As of February 2014, Japanese entities participated 108 times in FP7 signed grant agreements, receiving a total EU contribution of EUR 8.9 million. The distribution of the Japanese participation (by total cost of Japanese participants) over the different FP7 subprogrammes is shown below. To these figures must be added the 17 projects financed through 5 coordinated calls launched between 2011 and 2013 in the areas of energy, aeronautics, materials, and ICT.

416 Japanese researchers have been funded through the Marie Curie Actions (2007-2013) and Japanese institutions have participated in 59 projects.

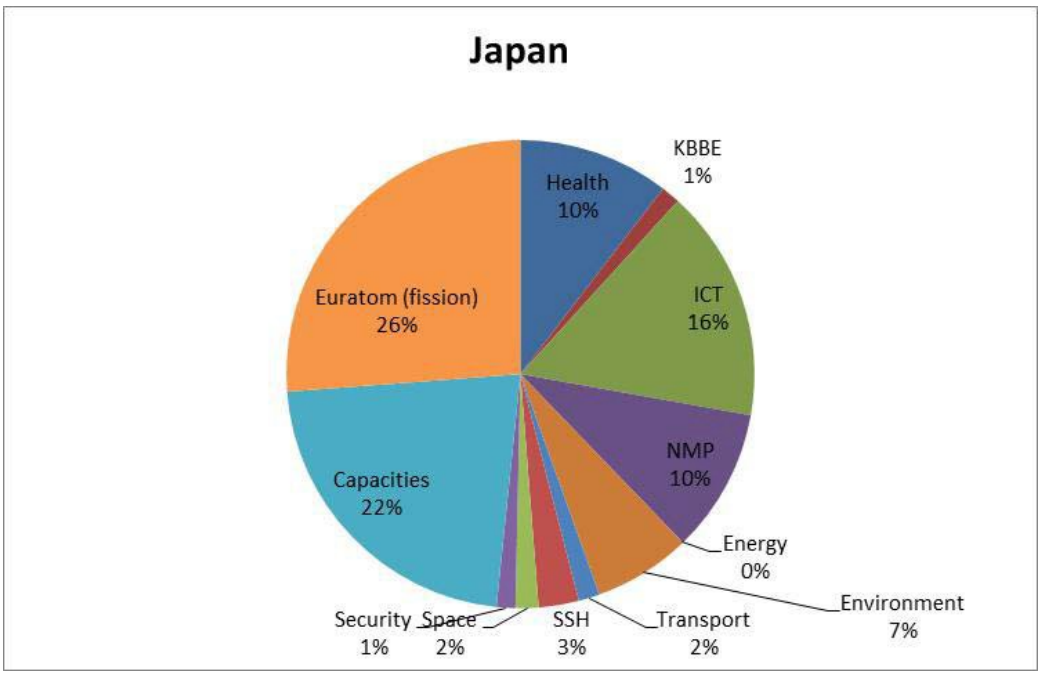

Figure 9: Distribution Japanese participation over different FP7 subprogrammes (Source: EC working document SWD(2014) 276 final)

ICT

ICT has long been the most active area of EU-Japan S&T cooperation, both at policy and project level. The EU and Japan have an active ongoing Information Society Dialogue, meeting each year, covering policy and regulatory issues, as well as research. The 20th meeting, on 4-5 December 2013 took stock of the progress achieved and confirmed the key priorities for future cooperation. A second coordinated call has been included in the work-programme 2014-15 of Horizon 2020 supporting joint research and innovation activities on Net Futures i.e. Future Internet, Internet of Things and Cloud Computing. Specific topics include technologies combining big data, internet of things, optical communications, access networks for densely located users and EU-Japan federated test- beds for smart ICT. Joint work on these areas is expected to be continued in the work- programme 2016-17 of Horizon 2020. In addition to these topics Japanese participation is also welcome in mainstream research and innovation dealing with new network infrastructures for Future Internet which includes 5G. : Possible cooperation on specific aspects of manufacturing technologies of micro-electronics. Prospects for further cooperation are also being explored in Cyber Security, Active and Healthy Ageing.

3.4.3.1.1 Context of research and innovation in IoT in Japan

Japan has always been very active in the IoT research and innovation, both from technological and political aspects. The Japanese Ministry of Internal Affairs and Communication had launched e-Japan Strategy in 2001 which defined Japan's priorities in terms of Information Technology, in particular, e-government, e-commerce, high speed internet and formation of highly qualified IT engineers. The roadmap aimed at improving the life of its citizens in various domains such as health, transport, entertainment, work, environment, social living and public services to make Japan one of the most advanced nations in terms of IT by 2005.

From 2005, following the spectacular advances in miniaturisation and communication technologies, Japan transforms its e-Japan plan into u-Japan (ubiquitous Japan), of which the objective was to set up all necessary infrastructure (e.g., wired and wireless communication), standardisation and regulation bodies to create a seamless ubiquitous network environment that offers smart services that can be used by anyone, anywhere at any time, and to realise the "Ubiquitous Network Society."

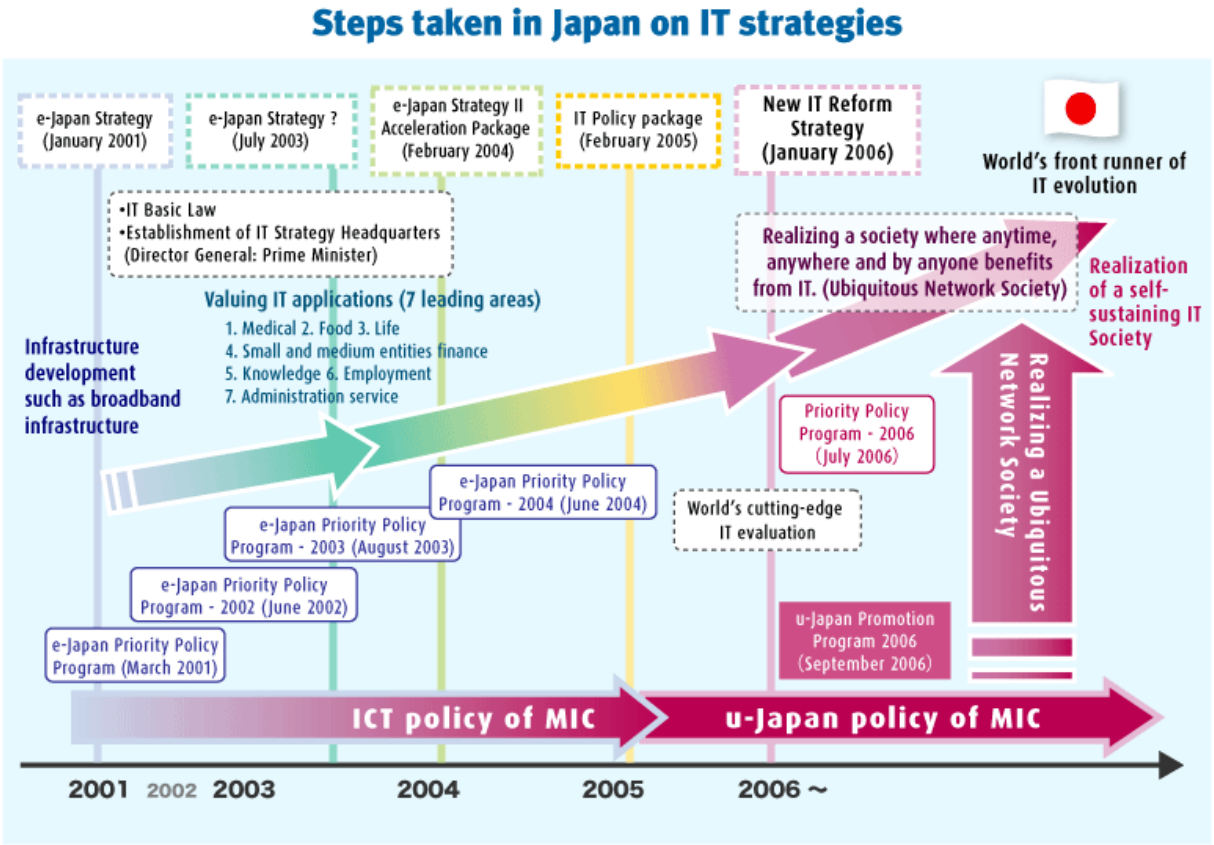

Figure 10: Steps take in Japan on IT strategies since 2001 (Source: MIC Japan)

Once the infrastructure and all necessary tools have been setup, Japan has identified various social and environmental problems to be resolved by the help of the ICT. In fact, the "u" in "u-Japan" represents not only "ubiquitous," but also "user oriented". Figure 11 illustrates the main target issues that had been identified and to be resolved by 2010.

Starting from 2010, the Japanese government encouraged public-private collaboration in order to deploy and test the IoT developments in city environments via real-life field trials. MIC has held a council on ICT smart town development and global expansion, between December 2011 and June 2012. The council studied the concept of ICT smart towns and proposed a scheme for building leading ICT smart town models by 2015. The MIC has organised several call for such projects. The following section introduces some of them.

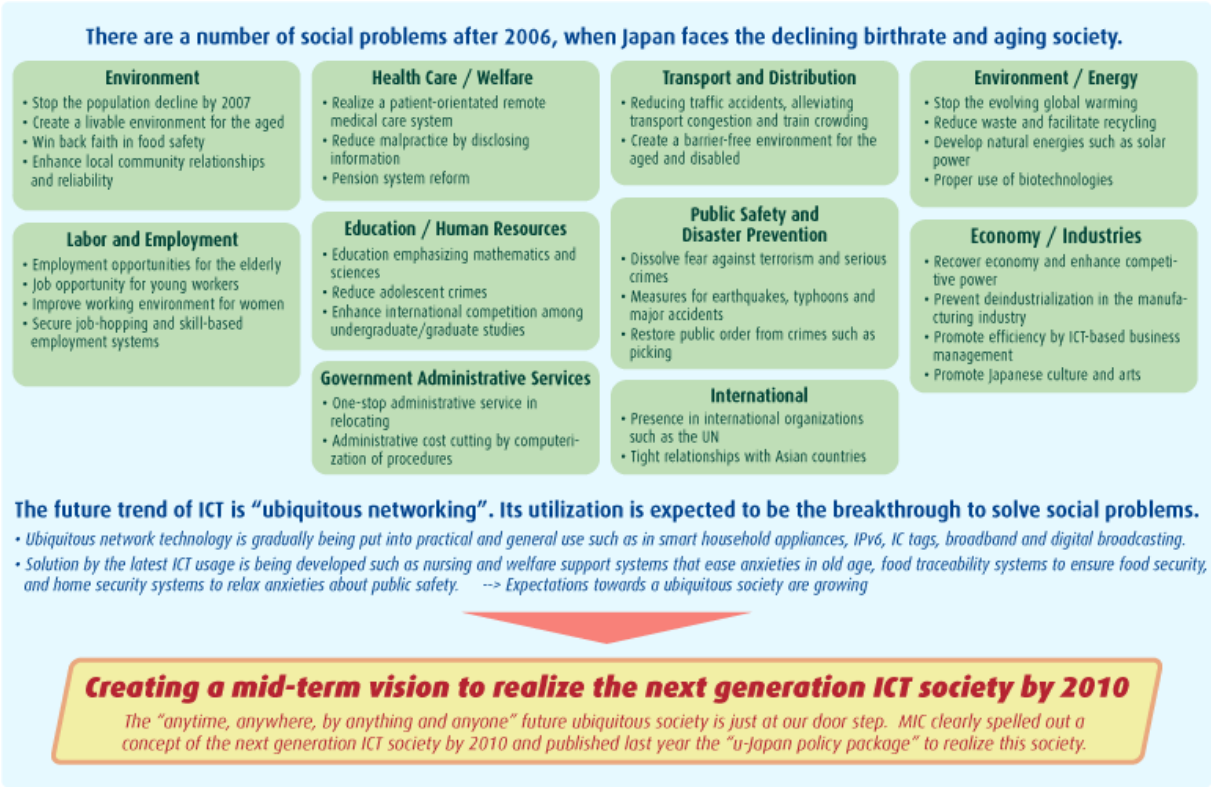

Figure 11: Main issues to be solved in Japan by 2010 (Source: MIC Japan)

3.4.3.1.2 Some IoT initiatives and projects in Japan

Japan has been one of the very early adopters and deployers of smart M2M solutions into daily lives, such as vending machines, mobile payment, NFC in transport and food tracing, smart homes and buildings, etc. In the recent years, MIC has focused on Japanese society's main concerns such as healthcare of aging population and disaster management. Under the umbrella of "smart cities", MIC has launched, with the participation of the Japanese industry and academy, several research and development projects. The first call had been organised in 2012 and 5 leading trial projects have been accepted in Kashiwa city, Toyota city, Mitaka city, Shiojiri city and Fukuori city. The following figure illustrates the concept of each of those projects.

Field trial area	Outline of field trials
Kashiwa-city, Chiba Prefecture	**<Medical and health care, Energy>** ● Medical and Health check based on the real-time collection, management and analysis of the health data. ● Enabling the environment for local citizens to have online access to their individual health data as well as relevant community information.
Toyota-city, Aichi Prefecture	**<Medical and health care, Transportation>** ● Saving medical history information in transportation IC cards and using it for emergency medical services. ● Making a system to collect traffic and disaster information from probe data.
Mitaka-city, Tokyo	**<Daily communication, Distribution of disaster information>** ● Making a data base of vulnerable people with common ID. ● Distributing disaster information around Wi-Fi spots in front of the train station and Mobile IP Terminals, and performing an integrated control of distributed information.
Shiojiri-city, Nagano Prefecture	**<Watching children, Regional information>** ● Providing sensor network information of children, damage caused by wildlife and water levels of the river for local residents over mobile phones. ● Utilizing a system to inform people of evacuation routes and to confirm the safety of victims.
Fukuroi-city, Shizuoka Prefecture	**<Agriculture, Logistics>** ● Making an agricultural products database of arrivals, shipping, processing and sales from RFID and optimizing its logistics. ● Utilizing a system for the delivery of relief supplies in case of emergency.

Figure 12: First IoT field trials in Japan (Source: MIC Japan)

Following the success of these projects, the MIC has decided to extend the call to 21 additional field trial projects with the following topics in mind: disaster prevention and mitigation; tourism/transportation: agriculture, forestry and fisheries; local e-government; energy and environment; and medical care. The following figure illustrates those projects on the map of Japan.

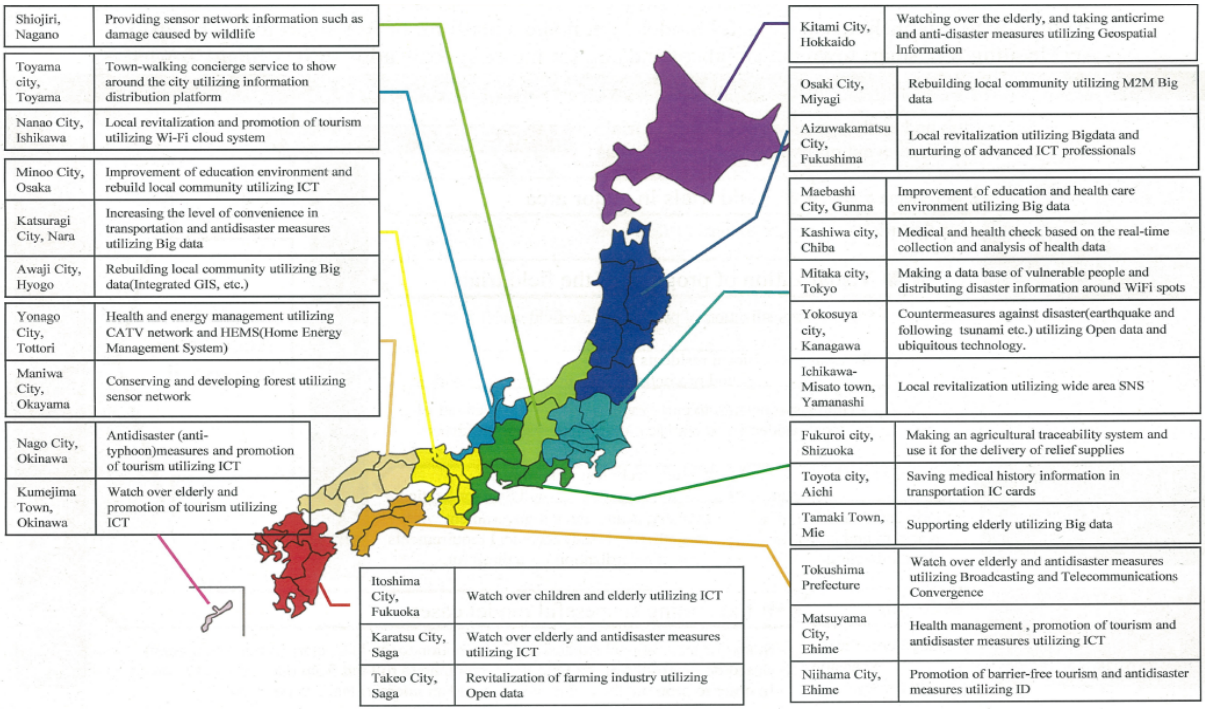

Figure 13: Geographical distribution of all field trials in Japan (Source: MIC Japan)

These projects have defined the roadmap from 2015 to 2018, which is to consolidate those individual smart city models and expand them into a sustainable and replicable model and apply them for other cities in Japan by 2018.

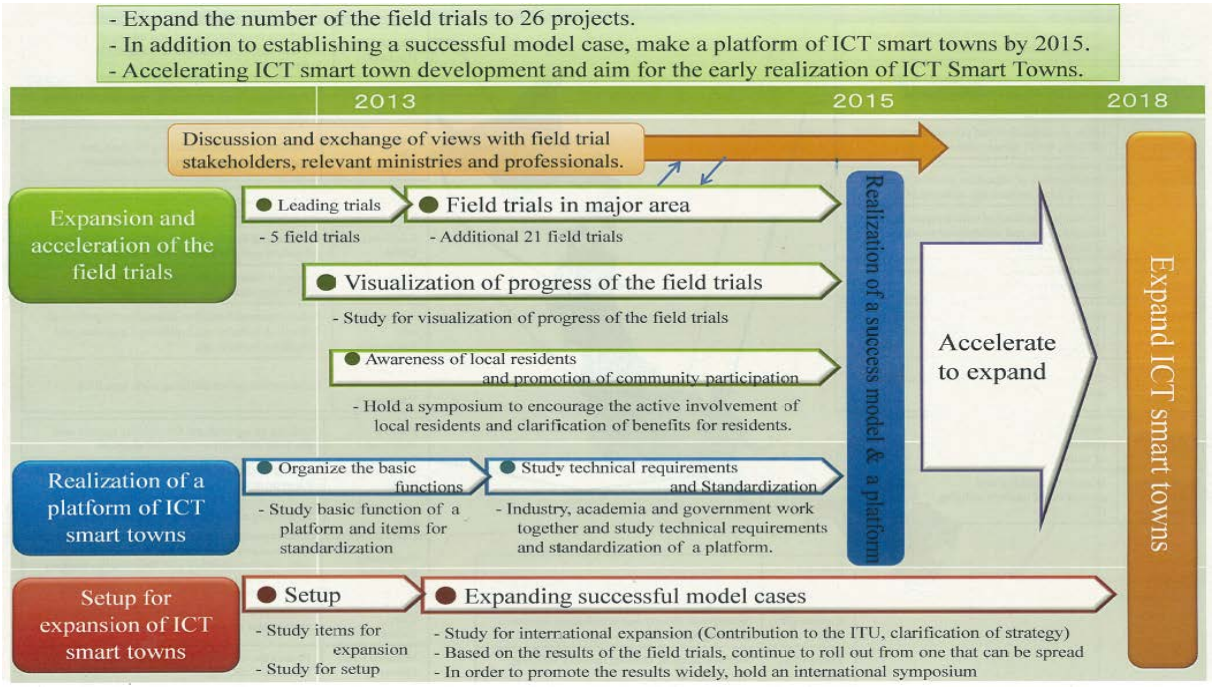

Figure 14: IoT strategy for the coming years in Japan (Source: MIC Japan)

3.4.3.2 Project actions for the EU-Japan cooperation

Coordination of the international engagement for Japan is organised through Levent Gurgen, CEA Leti, France coordinator FP7 EU-JAPAN project CLOUT and H2020 EU-JAPAN Festival where EGM is partner

3.4.3.2.1 List of meetings and exchange (2013-2014)

In March 2011, the Agreement between the European Community and the Government of Japan on cooperation in science and technology (S&T) entered into force. The first meeting of the Joint S&T Committee related to the S&T agreement in June 2011 in Tokyo, provided a new momentum to S&T policy dialogue. It allowed both sides to take stock of the state of cooperation, identify roadblocks, and agree on a first joint EU-Japan S&T Road Map for 2011-2013. Since then, several meetings (panels with experts, workshops, information days, etc.) have been organised to discuss on schemes for joint funding of ICT projects. A first call for projects in the context of the FP7 programme has been launched on 6 topics, each one with 3M€ funding equally shared by EC and MIC/NICT (National Institute of Information and Communication Technologies). Among the 6 topics, a topic directly related to the IoT was on "merging IoT and Cloud concepts". The ClouT project (http://clout-project.eu) was the winner proposal and is currently running as a successful European Japanese collaborative project on that topic.

After this first phase of joint projects, the commission and MIC/NICT have continued discussions to prepare for the next call for projects and organised a joint workshop in Brussels on April 2013. They

invited experts from Europe and Japan to identify the topics to be proposed for the next phase of joint calls in the H2020 programme.

3.4.3.2.2 Cooperation in projects

As a result of the joint EU-JP consultation workshop in April 2013, 4 topics have been identified for the first H2020 call for joint projects, with 3M€ funding for each project:

- EUJ-1-2014: Technologies combining big data, internet of things in the cloud
- EUJ-2-2014: Optical communications
- EUJ-3-2014: Access networks for densely located users
- EUJ-4-2014: Experimentation and development on federated Japan - EU testbeds

The first and the fourth are the ones that are directly related to the IoT domain. The iKaaS project won the funding for the first topic and the FESTIVAL project won the last topic[8].

3.4.3.2.3 Status of cooperation and achievements

The results of the midterm achievements of the projects that were launched in 2013 have been presented in a joint EU-JP symposium in October 2014 in Brussels[9]. The ClouT project, which is the first joint EU-JP project on Internet of Things, had already provided a reference Cloud + IoT architecture, and instantiated it via 4 field trials that have been organised in the pilot cities of the project, namely Santander, Genova, Fujisawa and Mitaka.

Participatory Citizen in Santander, Spain, is designed to involve citizens in city life by encouraging them, with their mobile phones, to report events and incidents to the city hall. Officials notify the citizens when issues are resolved and other citizens can access to these events and notifications. The application will be extended to other partner cities under common ClouT solutions.

The Paw Collection application in Mitaka, Japan, aims at contributing to health improvement and prevention of isolation of elderly people, by encouraging them to go out from home and walk through suggested routes that match with their interests and abilities. The application provides Social Network Service (SNS) like interface and they can communicate among them through same interests. As characteristic feature, people can try to do same experience that someone else did before. The sensor on mobile phone automatically detects their achievement of the try

Interactive city, Fujisawa, Japan, identifies sporting and cultural events and monitors environmental and weather data such as air quality, temperature and humidity by deploying various sensors throughout the city, and analyzing and classifying data collected from social networks, etc. This information is shared with citizens through a personalized city dashboard on the web, and via mobile applications and public displays.

The “Io non rischio” (I don’t risk) application in Genova, Italy, uses environmental and weather data from weather sensors, hydrometers, webcams, etc. and provides information to the citizens and the civil-protection agency of the city.

[8] The press release of the European Commission on that can be found at http://europa.eu/rapid/press-release_IP-14-1175_en.htm

3.4.3.2.4 Conclusion and foreseen actions on next period (2015)

Japan is one of the countries that have less international collaboration in its industrial culture. The Japanese MIC aims at changing this by launching joint international collaboration opportunities for Japanese industry and academy. At the same time, Europe wants to take benefit of the technological know-how and lessons learned from the Japanese industry. At an EU-Japan Summit organised in May 2014, the leaders expressed the aim for a "new strategic partnership in research and innovation". The areas, such as Critical raw materials, transport research including aviation and ICT, are considered to be priority areas for future cooperation with Japan. Related to the ICT, the joint EU-JP symposium organised in October 2014[9] included several sessions discussing future research topics such as 5G Radio Access, Testbed vision and strategy, Big data driven by IoT and Cloud, 5G Network Management, Social ICT Pilots and Speech-to-Speech translation. The invited experts from Europe and Japan presented their ideas of future collaboration that will be taken into account for the preparation of the future calls in the context of the H2020 2016-2017 work programme.

3.4.4 Taiwan

Since 2013 a laison was established with III (Industry Information Institute) in Taiwan and a first active workshop was organised in April 2013

Following this first efficient exchange a list of 10 action points was drafted as follows:

1. Synchronisation of research communities (eg IERC), Forming Value Nets and Communities
2. Joint Workshops, Events and Exchange Events
3. Define common areas of interest (eg publish white paper) and plan common actions
    a. Smart Cities, Smart Home, Smart Industry,
    b. Semantic Interoperability, Big Data Analytics
4. IOT, Cloud and Services Integration: World-wide Standardisation , Architecture Integration and Common Generic IOT platform
5. Project Collaboration: Match Making of Running Projects
6. Architecture, Security & Privacy, Ethics, Governance: Exchange on accompanying policy measures for IOT through IOT FORUM
7. The Synergy between Taiwanese Innovation Programs and H2020 Projects
8. Test beds and Joint Field Trials
9. Exchange of R&D People
10. Participation in Associations and Collaboration at Country level

Despite many contacts in particular at ioT week June 2013, ICT VilniusNovember 2013, IoT week London June 2014, III experienced a difficulty to make any significant progress and the liaison became dormant although the channel is established.

On May 7th and 8th, 2014, Pedro Marrón, UDE, project Coordinator continued the dialogue through a visit to III and Academia Sinica both in Taichung and Taipei. During the visit, a joint seminar with participation from Academia Sinica, GIS Center and III was organized in order to clarify and discuss further topics of common interest and to present some of the results from running projects with European and Taiwanese participation.

[9] http://www.ict-fire.eu/events/fire-forum-2014.html

Later IoT Forum decided to use this liaison and to attend the IOT conference 2014 and help to resume the discussion, as well as to keep active the liaison.

The meeting was organised in the context of iThings 2014 (http://ithings2014.org) in Taipei, Taiwan. As part of the conference we organised a plenary panel session on "IoT Forum and the EU - Taiwan Collaboration".

Panel Discussion: IOT Forum and the EU-Taiwan Collaboration **Conference Room**

Session Chair
Ko-Yang Wang
Executive Vice President, Institute for Information Industry (IOT Forum, Co-Ordinator for International Affairs)

14:15-15:15 In this panel, we have experts and leaders from the IOT International Forum to discuss IOT initiatives in EU and in Taiwan and the related EU FP7/2020 IOT projects.

Dr. Mirko Presser
Head of Research and Innovation, the Smart City Lab, Alexandra Institute, Denmark (IOT Forum Chair)

Dr. Payam M. Barnaghi
Centre for Communication Systems Research, Faculty of Engineering and Physical Sciences, University of Surrey, UK

Dr. Grace Lin
VP and Director General, Advanced Research Institute, Institute for Information Industry, Taiwan (IOT Forum Founding member)

Figure 15: Announcement of the EU-Taiwan Panel Discussion

Discussion points during the plenary:

Question by Yen-Kuang Chen from Intel was addressing the issue about platforms. At present many actors create platforms. How can we counter this trend and get more people to use the same platform(s).

All of the panellists contributed to the answer. Form the EU side we focussed on pushing the trend of building on existing platforms to concentrate funding.

Question by Yuh-Jye Lee from NTU was regarding IoT applications focussing on Thing-to-Thing communications – are the any?

M2M applications are predominant in industrial contexts for automation, safety and optimisation of processes.

Discussions behind closed doors:

1. Payam Barnaghi, Mirko Presser, Ku-Yang Wang and Grace Lin – collaboration opportunities in general.
2. Payam Barnaghi, Mirko Presser, Stanley Wang, Yi-Yuan Yueh, Tse-Ming Tsai (Eric), Novia Hsu and Jing Ming Chiu - creative industry, make movement, collaboration spaces.
3. Payam Barnaghi, Mirko Presser, Stanley Wang, Allen Yang , Wen-Fa Huang, Emery Jou, Ming-Whei Feng andChingwo Ma – technology collaboration.

The 1st meeting the discussion was focussed on:

- Exchange – 2 models, e.g. DK preferred model is a placement with full salary paid by a DK exchange partner ; UK preferred model is a placment with living support. Taiwanese model would be similar to UK model supporting living costs only. (aim for 1-2 bi-lateral exchanges in 2015).
- Event in October in Shanghai EU/China IoT
- Event 5th Dec organised by Grace to invite EU persons from IoT Forum, e.g. Rasmus Blom from Grundfos talking about the changes happenign in the out of the box based product industry
- Bootstrap the international IoT Forum affaires with Ko-Yang Wang.
- Aim for ICT-30 involvement of III and other Taiwanese partners.

The meeting was unfortunately cut short due to the schedule.

The 2nd meeting was with representatives from the Idea Institute of III:

- Focus of the Idea Institute is on Living Labs.
- Retail and Health are sectors of interest for the Idea Lab.
- Interested on keyword analysis in social media for social commerce – link to CityPulse.
- Method on Service Experience Engineering is an interesting point of learning for EU/Taiwn collaboration (4 stages : Find Trend, Build Ecosystem, Design and Develop, Living Lab)
- Maker space is an interesing topic – III haas entrepreneurial space for coaching.
- Hackathon – first one happened in 2014 and was a big success, Idea Week spin off (already running for 7 years)
- Interest in connecting to the Silicon Roundabout and Alex DS

The 3rd meeting – included persons from Smart Network System Institute form III and Eduardo Cerritos from National Chiao Tung University.

- Payam presented CityPulse and IERC
- Mirko presented Alexandra Institute, several EU IoT project results, IoT Forum and ICT-30
- Eduardo presented the Deep Plowing activities
- Emery Jou presented the activities of the Smart Network System Insitute
- Collaboration exist with Fraunhofer FOKUS, KU Leuven, Padova, FIT Lab in Strasbourg, etc. And Collaboration is being built up with several French organisations – at hte centre is INRIA.
- Ministry of Finance and Economics is planning a visit to Brussels to meet with the commission to discuss EU Taiwan programme on Communications (braod)
- Mention of visit to IoT 360 by III http://iot-360.eu/

Outcomes

Categories	EU	Taiwan
1. Synchronisation of research communities (e.g. IERC), Forming Value Nets and Communities	Connect IERC and IoT Forum to Taiwanese communities	Identify Taiwanese communities and connect III is a key entry point to the entire ICT community and other stakeholders.
2. Joint Workshops, Events and Exchange Events	IOT Week June 2013, ICT Event Vilnius Nov. 2013 IoT Week 2013 IoT Week 2014 IoT 360 IoT Week 2015	iThings 2014, Sept. 2014 October visit (in conjunction with Shanghai IoT EU/China meeting) Dec visit (Grace)
3. Define common areas of interest (eg publish white paper) and plan common actions – 4. Smart Cities, Smart Home, Smart Industry, 5. Semantic Interoperability, Big Data Analytics	Health, Retail, Energy Semantics, Analytics, Living Lab and other methods Big Data, IoT	
6. IOT, Cloud and Services Integration: World-wide Standardisation , Architecture Integration and Common Generic IOT platform	Test bed infrastructure	Interest in a combined IoT platform
7. Project Collaboration: Match Making of Running Projects	FP7 Societal (III) FP7 COSMOS (III) Future opportunities in ICT 30 and e.g. Royal Society	Several future opportunities in Smart City
8. Architecture, Security & Privacy, Ethics, Governance: Exchange on accompanying policy measures for IOT through IOT FORUM	FP7 Societal (III)	III has joined the IoT Forum as a sponsor member. Contributions to Architecture WG and Business Leadership WG.
9. The Synergy between Taiwanese Innovation Programs and H2020	Information on H2020, complementary mapping with Taiwanese programs	Information on corresponding programs;

Projects	(time-scales)	mapping with H2020
10. Test beds and Joint Field Trials	FP7 Societal (III) FP7 COSMOS (III)	TBD corresponding Taiwanese projects and initiatives
11. Exchange of R&D People	See above.	
12. Participation in Associations and Collaboration at Country level	TBD	TBD

3.4.5 South East Asia (SEA)

3.4.5.1 ICT in SEA

Southeast Asia is a very dynamic region with a population of about 600 million, rich natural resources and a relatively stable environment. The Association of Southeast Asian Nations (ASEAN) geo-political region is showing rapid economic growth. The integration process pushed forward by a strong political will of the ASEAN leaders will make it more competitive in the global market. According to high-level international economists the prospects for future economic growth remain good and a recent trend to invest in intangible capital (R&D investments) highlights the ASEAN political resolution to move from "merely sustaining healthy economic growth rates to having an economic growth that is "inclusive," "green" and "knowledge-based." The ASEAN leaders have envisioned that by 2020 the region will be technology competitive, competent in strategic and enabling technologies, with an adequate pool of technologically qualified and trained manpower, and strong networks of scientific and technological institution and centres of excellence.

The task of moving up the technology ladder and to enhance the capability for technological development is not easy though, since the ASEAN member states are ten developing countries with great variance in the level of science and technology capability. Singapore, for example, is very advanced and already today is a major ICT hub in SEA. Thailand, Philippines, Malaysia and Vietnam are very active in ICT research, Cambodia, Lao PDR and Myanmar are at the early stages of developing ICT research in some particular areas of interest. Brunei ICT research is still very limited. The ASEAN countries will have to move their cooperation forward more vigorously and promote deeper integration and at the same time more specifically tailor and target their investments.

As a first step, the ten ASEAN member states have endorsed a framework for intra-regional cooperation on science, technology and innovation - the KRABI initiative - in 2010. The diagram below illustrates the ASEAN strategic approach to consolidate intangible capital and to achieve a "knowledge-based economy" objective. Out of the eight areas identified as priorities for increasing the competitiveness of the region and improving the quality of life, two are ICT-related: regional digital society and embracing new media and social networking. The Krabi Initiative shall be referenced in the preparation of APAST 2016-2020.

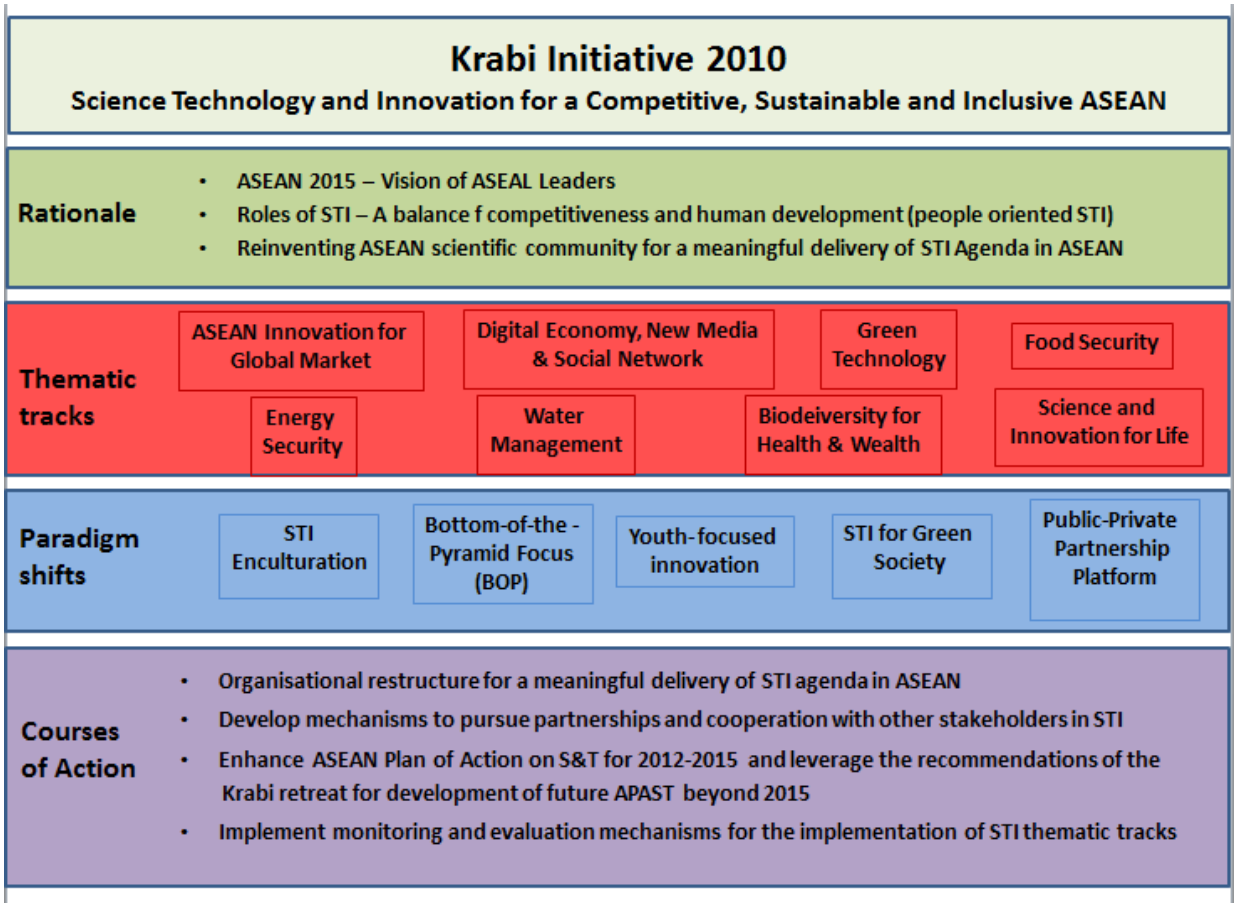

Figure 16: Overview of the Krabi Initiative 2010 (Source: http://www.asean.org/archive/documents/Krabi-101217.pdf)

3.4.5.2 Project actions for EU-SEA IoT cooperation

The project became aware of the CONNECT2SEA project aiming Supporting European Union and South East Asia ICT strategic partnership and policy dialogue: Connecting ICT EU-SEA Research, Development and Innovation Knowledge Networks

Figure 17 www.connect2sea.eu

This 30-month project will contribute to the creation of strategic synergies in the Information and Communication Technologies (ICT) research, development and innovation between the EU and SEA and also between SEA countries. The activities include the transfer of experiences and cross-fertilisation in order to leverage synergies between the countries involved and lay the foundations for strategic partnerships with sustainable impacts.

In May 2014, the CONNECT2SEA launched a call for proposal The CONNECT2SEA project launches a call for proposals for European and South East Asian (SEA) R&D ICT (Information and Communication Technologies) teams to initiate and to broaden R&D ICT collaboration

EGM teaming with Pau University and DERI/Insight made an application to organise a IoT workshop and R&D discussion between EU and SEA partners. The proposal was accepted a workshop,

scientific sessions and hackathons will be organised 25-27 January 2015 in Can Tho Vietnam collocated with RIVF 2015 (http://rivf2015.ctu.edu.vn)

Figure 18: Website of the International conference RIVF 2015 mentioning EU-SEA workshop on IoT

3.5 Brazil

3.5.1 Context of EU-Brazil cooperation[10]

As of February 2014, Brazilian entities participated 211 times in FP7 signed grant agreements, receiving a total EU contribution of EUR 31.3 million. The distribution of the Brazilian participation (by total cost of Brazilian participants) over the different FP7 subprogrammes is shown below.

With regard to fusion, there are presently about 15 on-going collaborative activities, involving 18 European research institutions and 14 Brazilian entities, and in particular, two specific JET (Joint European Torus, in Culham, UK) related projects. It has been also agreed that Brazilian scientists and PhD researchers can participate in JET activities.

1881 Brazilian researchers have been funded through the Marie Curie Actions (2007-2013) and Brazilian institutions have participated in 187 projects.

[10] Context from EC document "Roadmaps for international cooperation, COM(2014) 567 final and related document SWD(2014) 276 final

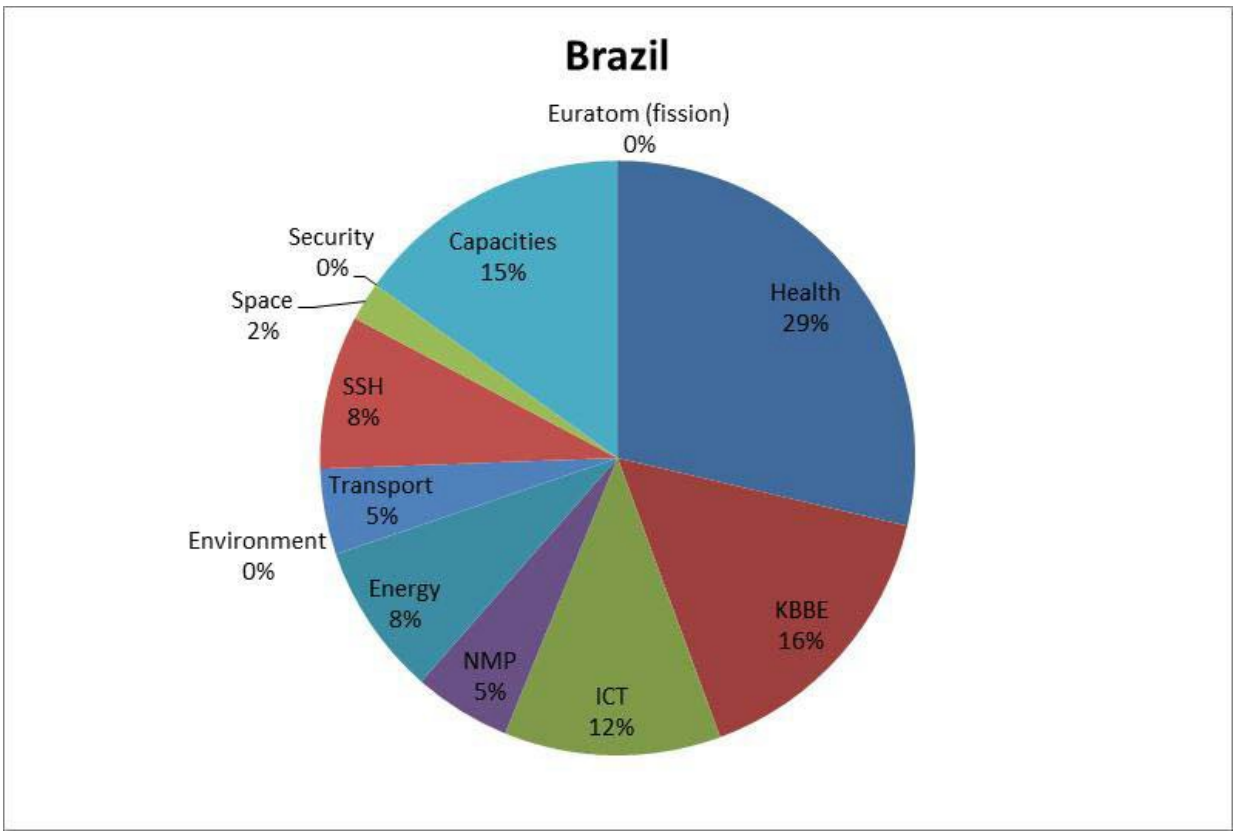

Figure 19: Distribution of Brazilian participation over different FP7 subprogrammes (Source: EC working document SWD(2014) 276 final)

There is an on-going FP7 project (BBICE+) which supports the policy dialogue and durable partnerships between the EU and Brazil.

Brazil has been targeted as an important partner for cooperation in the first Horizon 2020 work programme (2014-15), encouraging cooperation with Brazilian researchers included in areas such as biofuels, ICT and marine research. A full list of topics included in the work programme 2014-2015 is provided in Annex.

The scope of direct scientific interactions carried out by the European Commission's Joint Research Centre with partners in Brazil include the areas of disaster prevention and crisis management; sustainable management of natural resources, in particular forests and water; energy with a focus on smart grids; food security; bio-economy; ICT, including geo- information and space applications; nanotechnologies.

Work is on-going to strengthen the synergies between the EU's cooperation with Brazil and the activities of the Member States (MS), including through the Strategic Forum for International Cooperation (SFIC). The collection of information carried out through SFIC indicates that the research topics addressed in cooperation with Brazil vary widely. It is noteworthy that a large number of agreements between individual Member States and Brazil do not have a specific thematic field and follow a bottom-up approach. They are often centred on researchers' mobility and, to some extent, access to European research infrastructures.

Finally, cooperation on research and innovation is a core area of the EU Brazil bilateral cooperation and it contributes significantly to the achievement of the EU's external policies. The importance of cooperation on research and innovation in addressing the shared economic, environmental and societal challenges within the context of the overall EU-Brazil relations has been reiterated at the XVth Joint Committee of November 2013 and at the EU-Brazil Summit of February 2014. Research and Innovation features prominently in the EU-Brazil Joint Action Plan on Competitiveness and Investment, which has been welcomed by leaders at the last Summit as a building block for future EU-Brazil cooperation on these themes. Moreover, remarkable synergies are been created between research policy and external action instruments. In some of the areas targeted for research and innovation cooperation, synergies are being built up with the Sector Dialogue Facility for Brazil, a DCI programme that aims at strengthening Sector Dialogues between Brazil and the EU in 33 different areas, among which research and innovation is an important priority.

For the future, in an effort to make research cooperation an integral part of a comprehensive package of external actions, and given the strategic role of Brazil in tackling the global challenges addressed by cooperation in research and innovation, more synergies will be sought with other external instruments, in particular with the Partnership Instrument.

In the framework of the policy dialogue between the EU and Brazil the following priority areas have been agreed for future cooperation with Brazil:

ICT:

EU-Brazil research cooperation in the area of ICT, including cloud computing, is also regarded as having a crucial strategic value and high societal impact. It has been developing since the launch of the first coordinated call in 2011 and addresses a number of topics dealing with Future Internet, micro-electronics and micro-systems, cloud computing, technologies and applications for a smarter society and e-infrastructures. It is supported by an EU-Brazil Dialogue on Information Society with specific working groups in some areas addressing not only research and innovation matters but also ICT policy and regulatory aspects. As an example, cooperation on cloud computing covers standards, certification mechanisms, safe and fair contracts as well as legislative frameworks, aiming at facilitating the emergence of mutually recognized trusted cloud solutions. The third coordinated call focused on Advanced Cyber Infrastructure and will be launched in 2015. It will address topics on Cloud Computing, especially cloud-centric applications for big data; High Performance Computing applications to societal challenges supporting prediction and simulation of natural disasters, urban development or crisis management, and Experimental Platforms federating network resources in Brazil and Europe building on FIRE (Future Internet) developments. Joint work on the areas above is expected to be continued in the work-programme 2016-17 of Horizon 2020. The importance of ICT entrepreneurship for growth and jobs is reflected in a reinforced cooperation between "Startup Europe" and "Startup Brazil", exploring the mutual benefits of "apps" development by young web-entrepreneurs and SMEs, on top of open and common Future Internet platforms. On ICT infrastructure, the installation of a fibre-optic submarine cable linking Brazil and Europe directly will improve communications between the two continents, facilitate the take-up of broadband, stimulate ICT investments, reduce the interconnectivity costs for our businesses and researchers, enhance the protection of communications and provide better functional characteristics than through the USA or

Africa. This cable can be used to implement more effectively public policies such as the bilateral cooperation on research and innovation.

3.5.2 Project actions for EU-Brazil IoT cooperation

Coordination of the international engagement for Brazil is organised through Pedro Malo, UNINOVA Lisbon, and Gabriel Marao, IoT association Sao Paulo

Context of research and innovation in IoT in Brazil

So far research and innovation in IoT has been made without any global planning. As there is no strategic research agenda and projects are in many cases defined by the interest of academic individual researchers there are few research really being made in IoT. Most of what has been done was based in EC joint projects and in Smart Grids and Smart Cities where multi national companies operating in Brazil in Electricity and Telecommunications are using special incentive funds generated from their volume of sales in Brasil. There are some very interesting projects made by companies without funds from the government. Examples are found in Retail of Clothes, Flowers.

There is no evidence that IoT in Brazil is promoting the society's welfare.

Also there is no effort to understand the need for Interoperability. In the maximum they use the GS1 standards.

The Brazilian IoT Competitiveness Forum works to change this situation. It has organized several national and international encounters and has been successful in establishing a dialogue among different stakeholders: academia, industry, government and end users. The next step is to arrive at a document that could be the seed of a strategic research agenda and could help to direct the official investments to use technology to help to solve the actual needs of the society.

Some IoT initiatives and projects in Brazil

BRASCOL - Cloths Wholesale
HOLAMBRA - Flowers Distribution
ARMY - Inventory control
PETROBRAS - Equipments inventory (offshore logistic)
AERONAUTICA - Inventory control
HP - Life Cycle of Products (printers and cartridges)

VALE DO RIO DOCE - Equipments and Tools inventory

SMART CITIES / SMART GRID

- Aguas de São Pedro
- Aparecida do Norte
- Rio de Janeiro
- Búzios
- São José dos Campos

BRAZILIAN IOT FORUM

Figure 20 :Smart Action is in close contact with Brazilian IoT forum http://www.iotbrasil.com.br/new/en/

List of meetings and exchange (2013-2014)

- Brazilian Events with EC participation
- EVENTO probe maio 2013
- BNDES 2014
- EVENTOS IBE
- EC events with Brazilian participation
- Aalborg, Denmark - May 2012 - Future Internet Week
- Veneza, Italy - Jun 2012 - IoT Week 2012
- Hammamet, Tunis, - Sep 2012 – International Workshop
- Bled, Slovenia, Nov 2012 - 3rd Meeting of The IoT International Forum
- Helsinki,Finland - June 2013 - IoT Week 2013
- Vilnius, Lithuania - Nov 2013 - ICT 2013
- London, England, Jun 2014 - IoT Week 2014

3.6 India

India is also an important countries listed in the H2020 priorities with detailed roadmap.

In September IoT forum has signed an MoU with india M2M+ IoT forum (http://www.indiam2mforum.com) and a common supported conference is now planned for 19-20 February in Dehli. This will be an opportunity to establish a liaison with India

india m2m + iot forum
capitalizing connected world

Now in its 2nd edition, India m2m + iot Forum has gained a repute of being a not-to-be-missed conference for the professionals engaged in machine-to-machine (m2m) and internet of things (iot) domain and its various vertical industry application.

India m2m + iot Forum is the most premium global platform for M2M and IoT community and offers the best opportunity for learning, sharing, connecting, networking, branding and positioning with senior decision makers associated with M2M and the IoT world.

The conference aims at enriching the M2M and IoT ecosystem with market intelligence, technology trends, success stories and capacity building. It is a confluence of a variety of activities in the form of keynote sessions, panel discussions, technology showcase, dialogue and exchange forums - covering the vast gamut of technology, application, policy, use cases from across India and the world.

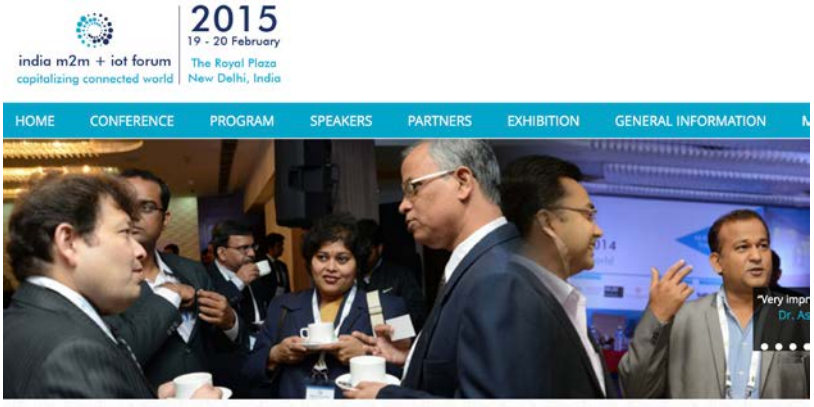

Figure 21: Webpage of the India IoT conference where EU presences is scheduled

4 Organising conferences

At the end of the project SMART ACTION will have organised more than 2 conferences as the schedule of conferences organised or coordinated by the project is :

- EU-US workshop 8 october 2014, MIT Cambridge
- EU-China conference 28-30 October 2014 Shanghai
- EU-SEA iOT Workshop 25-27 January 2015

It is expected to have the following follow up workshops:

- EU-US follow up spring 2015
- EU-China Follow up 1Q 2015
- EU-Japan workshop 1Q 2015

We expect also continuing liaisons with Korea, Brazil and set up new liaison with SEA and India.

5 Next steps

As introduced at the beginning, the main objectives of this activity reported here is to consolidate the International road mapping. For that it was necessary to establish or strengthen liaisons at international level. This was done mainly in first period. Second period will be then to use all these international channels to get feedback and inputs to the International roadmap, which will be available in 2nd period. Therefore in 2nd period we will have 2 main activities:

1. Maintain and develop International channels in particular with
    a. Brazil, Japan and Korea through our liaison partners. Meetings will be organised in 3Q 2014 and follow up ones in 2015
    b. China, Taiwan with meetings in September and October 2014 and follow up meetings scheduled in March and June 2015
    c. USA with first meeting in October 2014 and follow up meeting scheduled 1 half 2014
    d. South East Asia with first meeting scheduled end January 2015
    e. India with first coordinated contact in February 2015 in New Delhi
2. Use international establish channels to consolidate our international roadmap. In particular the following actions can be undertaken:
    a. Submit first draft international roadmap around December 2014 to international partners using established liaisons
    b. Get feedback and contributions from international partners at various organised meeting
    c. Organise a global discussion at international level in spring 2014 and anyway at IoT week, June 2015 at the latest