edge alone does not necessarily generate economic value. On the other hand, products with little knowledge content, usually cannot defend their niches for long, if at all. Smart specialisation fields are often at the cross-section of different sectors, technologies or knowledge domains.

The selection of specialisation fields and the setting of priorities should not be a top-down action. It should be an inclusive and interactive process in which market forces and the private sector are discovering and producing information about new activities (entrepreneurial process of discovery) and the government assesses the outcomes and empowers the most capable actors for realizing this potential.

A regional strategy for smart specialisation (RIS3) should embrace a broad view of innovation, not just a technological one, from market innovation to social innovation. It should consider not only the manufacturing but also the service sector from tourism to creative industries. This is to allow each region and member state to prioritise and shape policy choices according to their unique socio-economic conditions and assets.

As far as policies are concerned, RIS3 needs to clearly outline the policy mix (EU funded and other) that will be used for its implementation; mere political visions and objectives are not enough. The outlined measures should be fit to stimulate private R&I investment. The RIS3 should also include monitoring and evaluation well as a revision mechanism for updating the strategic choices.

**Abstract**

Smart specialisation is an approach that combines enterprises, industrial, educational, research and innovation policies to identify and select a limited number of priority areas for knowledge-based investments, focusing on strengths and comparative advantages. This article provides a first set of insight and cases on the current state of the art of the process in Europe based on the experience gained on the field by the authors. Challenges for priority setting and design of policy mix are presented to the attention of policy makers and executives for further discussion.

**Introduction**

Smart specialisation is a place-based approach, building on the assets and resources available to regions and countries and on their specific socio-economic challenges to identify opportunities for development and growth. Smart specialisation was chosen by Europe to make the most effective use of limited public resources to promote economic development through targeted support to research and innovation (R&I). Smart Specialisation is the basis for European Structural and Investment Fund interventions as part of the current regional and cohesion policy’s contribution to the Europe 2020 jobs and growth agenda. For the 2014–2020 programming period, the requirement for a national or regional R&I (strategy) (strategy) (strategic policy framework(s)) for smart specialisation is an **ex ante** conditionality for the European Regional Development Fund investments in research and innovation\(^1\).

The definition of a smart specialisation requires a vision, evidence-based competitive advantages, a limited number of strategic priorities, and the active involvement of the private sector as a base to identify and implement a well-defined set of policies to maximise the knowledge-based development potential of any region, being it strong or weak, high-tech or low-tech.

**The RIS3 approach**

A smart specialisation field/area is connected to effectively matching knowledge domains with market potentials. Knowledge alone does not necessarily generate economic value. On the other hand, products with little knowledge content, usually cannot defend their niches for long, if at all. Smart specialisation fields are often at the cross-section of different sectors, technologies or knowledge domains.

The selection of specialisation fields and the setting of priorities should not be a top-down action. It should be an inclusive and interactive process in which market forces and the private sector are discovering and producing information about new activities (entrepreneurial process of discovery) and the government assesses the outcomes and empowers the most capable actors for realizing this potential.

A regional strategy for smart specialisation (RIS3), should embrace a broad view of innovation, not just a technological one, from market innovation to social innovation. It should consider not only the manufacturing but also the service sector from tourism to creative industries. This is to allow each region and member state to prioritise and shape policy choices according to their unique socio-economic conditions and assets.

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**A RIS3 “logical intervention path”**

**Priority setting**

A RIS3 should prioritise domains, areas and economic activities where regions or...
countries have a competitive advantage or have the potential to generate knowledge-driven growth and ignite/sustain the economic transformations needed to tackle the major and most urgent challenges for the society (Table 1).

Priorities could be framed in terms of knowledge fields or activities (not only science-based, but also social, cultural and creative ones), sub-systems within a sector or cutting across sectors and corresponding to specific market niches, clusters, technologies, or ranges of application of technologies to specific societal and environmental challenges or health and security of citizens (e.g., ICT for active ageing, mobility solutions to reduce traffic congestion, innovative material solutions for eco-construction, etc.). Although some regions or countries may prioritize one or more key enabling technologies (KETs), others will focus on applications of such technologies to specific purposes or defined fields.

"Most advanced regions invest in the invention of generic technologies, others invest in the co-invention of applications of the generic technology in one or several important domains of the regional economy."

Source: Dominique FORAY

**Table 1: A RIS3 “logical intervention path”**

<table>
<thead>
<tr>
<th>Regional policy objectives</th>
<th>RIS3 priorities</th>
<th>Means to be deployed</th>
<th>Schemes</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic growth</td>
<td>Supporting private investment in R&amp;D infrastructures</td>
<td>Co-investing in R&amp;D infrastructures</td>
<td>Business support “open” infrastructure</td>
<td>New skills</td>
</tr>
<tr>
<td>Sustainable development</td>
<td>Stimulating innovation</td>
<td>Strengthening entrepreneurial approaches</td>
<td>Cross-border and international actions</td>
<td>Talents attracted (back)</td>
</tr>
<tr>
<td>Job creation</td>
<td>Enhancing SME competitiveness</td>
<td>Promote contaminations</td>
<td>Financial facilities</td>
<td>Start-ups/Jobs in new markets</td>
</tr>
<tr>
<td>Social inclusion</td>
<td></td>
<td>Fostering international University/ SME collaborations</td>
<td>Mentoring services</td>
<td>Internationalization of existing companies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transforming publicly funded knowledge into market applications</td>
<td>Support to commercialization of innovative products/services</td>
<td>Added value jobs created</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Facilitating the introduction of new products/services into the market</td>
<td>Key stakeholder matching</td>
<td>Foreign direct investment attracted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Encouraging the creation of new firms (spin-offs)</td>
<td>Competence building on entrepreneurship</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Promoting the scale-up of product range</td>
<td>Marketing of “Excellence”</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own elaboration based on Regional Policy for Smart Growth on SMEs

**A specificity for each region**

Organisational, market, service and social innovation play an important role in RIS3 as technological innovation based on scientific research. This is especially relevant for regions with comparatively weaker technological and science basis. Although a first set of priorities should be identified when the RIS3 is designed they can be changed or modified, when new information/developments make it advisable.

Priorities should be identified based on two fundamental processes:

- Focusing on market opportunities, differentiating from others, taking (and managing) risks and seeking alliances to optimise the access to and use of resources (physical, financial, intangible, such as talents, etc.).
- An objective analysis of the region/country current positioning in terms of research, innovation (including existing infrastructures), industrial structures (including clusters, position in value chains), skills and human capital (academic and other), demand (including public and societal demand), public and private budgets for research and innovation, framework conditions, and performances of the innovation eco-systems.

**The entrepreneurial discovery Process**

The Entrepreneurial Discovery process (EDP) is one of the ‘conceptual pillars’ of Smart Specialisation. This bottom-up approach is crucial to understand the main feature that distinguishes S3 approaches from innovation strategies of the past. EDP links priority-setting and the importance of market processes in producing information about the identification of the best domains for future priorities. EDP is supposed to do so in a non-prescriptive, bottom-up fashion, with no a priori preferential access to knowledge about future opportunities.

The EDP uses the entrepreneurial knowledge existing in a region or country and takes an entrepreneurial approach by focusing on market opportunities, differentiating from others, taking (and managing) risks and seeking alliances to optimise the access to and use of resources (physical, financial, intellectual, market knowledge, etc.). EDP should help avoiding the shortcomings of purely political interest-driven strategies, because full stakeholder involvement, through EDP, allows to draw
operational conclusions out of the results of the SWOT/statistical type of analysis to shape ownership around the strategies and to design the intervention methods according to the needs of innovation actors, in particular of course the enterprises.

The ED process in short includes:

- bottom-up process in which stakeholders from different environments (policy, business, academia, etc.) discover and produce information about potential new activities and identify opportunities that emerge through this interaction, while policymakers assess outcomes and ways to facilitate the realisation of this potential.
- integrating knowledge fragmented and distributed over many sites and organisations, companies, universities, clients and users, specialised suppliers (some of these entities being located outside of the region) by building of connections and partnerships.

- exploring and opening up of new domain of opportunities (technological and market), that are recognised as feasible and attractive.

### The EDP in short

#### Case study: the Integrated EDP

This case by EURADA, the European Association of Regional Development Agencies, discusses on how to approach the EDP by a strong interaction between the enterprise innovation trajectory and the policy mix (Enterprise Centric Approach).

The approach postulates that: (a) any enterprise has to choose between different types, nature and ways to innovate respond to a market or a niche demand with a unique set of competitive advantages. To do that, each enterprise has to enter in a more open process to gather relevant resources (knowledge, technology, human and finance), carry out innovation and find the right route to markets; and (b) each type of innovation requires ad-hoc sets of support services (public and/or private) ranging from generic awareness raising to sophisticated financial instruments. The aim of those services is to help enterprises (SMEs) better integrate their resources in an efficient way.

Figure 1 presents the ingredients of the integrated (entrepreneurial) discovery process. The various parts of the graph have to be tailored to fit the requirements of each type or nature of innovation to be supported.

![Figure 1: The integrated (entrepreneurial) discovery process](image-url)
The implementation of the IDP process requires the regional stakeholders to revise their approach:

- Civil society: play their role in defining social and societal needs and contribute to the emergence of new products and services.
- Academics and researchers: understand the game of innovation and market forces and adapt their services to the expectations of enterprises including helping regional enterprises absorb new knowledge from the outside.
- Investors: contribute with new financial instruments and update their assessment grids to incorporate the risks of novel ways of innovating.

- Policy makers: review the effectiveness of the policy mix for the different innovation trajectories of regional enterprises. This can be done through interviews with different samples of enterprises clustered in accordance to the type or the nature of innovation they are investigating.

Figure 2 presents how the IDP model addresses a production process breakthrough innovation trajectory.

Policy makers have to find the right means to help the interaction between the enterprises’ needs in terms of response to market and competitive advantage to be built and the support services to be supplied to enterprises. The best way to find a relevant approach which fits to enterprise needs (beneficiary-centred approach) is to involve them in the design and monitoring of the policy mix.

In parallel, the public authorities have, for each type or nature of innovation, to encourage a pipeline of projects matching their Regional Smart Specialisation Strategy (RIS3) ambitions. To do so, they can for instance undertake actions such as:

- Challenge-oriented pre-commercial procurements;
- Innovation plan competition (Hakathon);
- Foresight exercises for each type or nature of innovation;
- Brokerage of irrelevant patent of large local enterprises;
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- Problem solving vouchers provided to SMEs to acquire knowledge from specialised service providers;
- Co-creation labs / B2B project stimulation; and
- Defining new ways to support innovation.

Case study: RIS3 UMBRIA

Umbria is a non-S&T driven Italian region with a population growth and inflow. The regional innovation system is characterised by strengths such as a share of graduates in scientific and technological disciplines above the national average and a high level of public research technological development and innovation (RTDI) expenditure.

Main weaknesses include: a low presence of medium-sized enterprises\(^2\), low level of private investment in R&D coupled with difficulties by SMEs to access finance for R&D, insufficient collaborations and connections between enterprises, universities and research centres, low propensity to patent, low capacity to retain talents and attract external investors, a regional R&D not characterised by strong outputs, and limited use of ICT by SMEs.

For the new 2014–2020 programming period, Umbria region has based its RTDI policy on a RIS3 focusing on R&D result exploitation rather than R&D per se. The aim is to accelerate the adoption of innovation by leveraging on the regional assets and talents, access to research results and promotion of entrepreneurship.

RIS3 Umbria identifies five main directions for change: (i) research results valorisation; (ii) innovative start-ups and knowledge intensive entrepreneurship; (iii) openness towards international markets; (iv) diversification of regional enterprises; and (v) quality of life and attractiveness of the region. RIS3 also selects green chemistry, agro-food and aerospace as areas for regional specialisation. The main novelty will be a 360° vision of innovation not only focusing on technological innovation but also broadening its scope for social, organisational, market and user driven innovation.

The planned policy interventions will promote clustering of firms to bring product to the markets while opening up to participants from outside the region and access to services, including the ones related to creativity and design. Possibility to activate demand-side initiatives (Pre-commercial Public Procurement) is envisaged for the first time in a regional policy mix defined in the RIS3. The fragmentation of the production structure, a specialisation in low and medium-low technology sectors, the weakness of endogenous R&D at international level has suggested to concentrate interventions in facilitating access to R&D results wherever they are made available and to support knowledge intensive start-up creation and demonstration activities. The need to diversify the regional economic structure moving towards more added value areas and access innovative solutions by endogenous SMEs and public institutions has led to the choice of investing the European Structural Investment Fund (ESIF) resources in company creation leveraging on the talents living in the region or willing to return back to Umbria.

Within this framework, RIS3 Umbria adopts a vision of innovation at 360°, thus including those components not strictly technological, but societal, organisational and user-oriented. The strategy operates in an open and cross-sectoral perspective, maximising complementarities and synergies between community, national and regional funds to facilitate change and better exploit intangible assets present in Umbria. RIS3 Umbria identifies, as fields where the region has achieved external recognition, green-chemistry, agro-food and aerospace. In such context, the Smart Specialisation strategy intends to give to innovation a larger role, including services to citizens and talents, to accelerate a shift towards a more intensive knowledge economy while continuing to support competitiveness of existing companies by facilitating their access to research results in an international context.

In consistency with the RIS3 the European Regional Development Fund - Regional Operational Programme (ERDF ROP) also intends to encourage the return of young entrepreneurial talents and to support the generational change, which a key ingredient to facilitate innovation processes. Such an objective will be achieved with measures incentivising business networks, clusters, spreading of a culture of entrepreneurship and innovation.

A new orientation in the innovation policy in Umbria is the focus on downstream activities in the R&D value chain (Box 1). The focus of the regional strategy of smart specialisation is not placed on the new knowledge (research in excellence areas) but on access to the research results (also produced elsewhere). This calls for specialisation of the intervention levers of the strategy to facilitate and/or accelerate the advantages in the region (e.g. adjustment, prototyping, proof of concept, experimentation on the market, etc.) and a selection of areas of specialisation for large scale interventions (e.g. agro-food, green chemistry, aerospace and tourism).

The Table 2 below presents the relation between the results the strategy intends to achieve, the levers to be activated to promote a change and the tools to implement. The palette for the proposed tools considers novel financial instruments (proof of concept co-investment instrument), and includes demand side approaches (pre-commercial public procurement). However, in some cases, already existing tools will follow-up with innovations concerning geographical coverage (open to participants also from other regions/countries) and beneficiaries (large industries and mid-caps).

The Co-Investment Fund, an innovative financial instrument

Common challenges for RIS3 are linked to engage private resources to how

\(^2\) There are approximately 83,000 firms in Umbria, 28% of which are craft enterprises.
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**Box 1: Challenges for the future and RIS**

**Better cooperation and openness between the research and business systems**

Umbria is not an outstanding region in terms of production of new knowledge coming from state-of-the-art research. Even though the regional context does not appear to be adequate to develop excellence in research activities, it is adequate for using results coming from research activities developed in other areas. Access to R&D exploitable results, clustering talents, SMEs and larger companies, opening up to international markets are objectives of the 2014–2020 ERDF OP.

RIS3 will support the downstream activities of research through the application of research results in trials relevant to the economic and social potential of regional and international marketing. It will also support aggregation and clustering between enterprises within and outside the region.

**Diversification and change of the regional economic structure**

Umbria is witnessing a decline of its competitive advantage in traditional sectors (e.g., food, fashion, mineral processing and metallurgy) leading to the need for repositioning of the regional production system.

The region will support the shift of the regional economic structure towards more added value areas by investing in knowledge intensive startups and in developing new production chains (clusters and business networks) and in projects focused on niches of greater regional competitive potential (green chemistry, agro-food, aerospace). This will also include actions to bridge the demand for innovation by enterprises (existing SMEs and startups) and public sector with knowledge providers via vouchers to access services, coaching and pre-commercial public procurement actions facilitating access to first client.

**Efficient supply of innovative services to citizens and businesses**

A low density of population (104.5/km², compared to an Italian average of 197.1/km²) and a settlement pattern “widespread” over the region makes the provision of infrastructure and services to citizens and enterprises expensive and difficult.

The region intends to support innovation and quality of services for citizens and enterprises, promoting innovation in the public sector (regional data centre, digital proceedings, and centralised ICT pole) and offering digital services to citizens and companies. This action will be coupled with the promotion of strategic projects aimed at the regeneration of physical, social, and economic contexts of specific areas (cities and inland areas) and demand-side actions. Strategic projects will be defined using a participatory approach, based on the entrepreneurial discovery process, involving all the relevant stakeholders at the concerned territorial level.

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**Table 2: Umbria, relation between results, levers, actions**

<table>
<thead>
<tr>
<th>Expected results</th>
<th>Levers</th>
<th>Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of a culture for research valorisation</td>
<td>1. Use of research results obtained in the region</td>
<td>Proof of Concept co-investment Fund</td>
</tr>
<tr>
<td>• Research downstream integration with the enterprise system</td>
<td></td>
<td>Fellowships</td>
</tr>
<tr>
<td>• Rooting of innovative sectors</td>
<td>2. Use by the SMEs of the research results developed in Italy and abroad</td>
<td>Framework programme</td>
</tr>
<tr>
<td>• Major opening towards international markets</td>
<td></td>
<td>Incentives for prototyping</td>
</tr>
<tr>
<td>• Reinforcement of the components with a major added value</td>
<td></td>
<td>Pre-competitive Public Procurement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Increase of the entrepreneurial culture with a particular attention towards knowledge intensive sectors</td>
<td>3. Promote and support knowledge-based entrepreneurship with an orientation towards international markets</td>
<td>Co-investment fund in start-up, expansion phase</td>
</tr>
<tr>
<td>• Major importance of the non-traditional sectors in the regional economic system</td>
<td></td>
<td>Global grant for the promotion of the entrepreneurship.</td>
</tr>
<tr>
<td>• Major attractiveness towards talents</td>
<td></td>
<td>Incentives for the employment of young talents by the start-ups</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cross-industry collaboration/contamination (related variety)</td>
<td>4. Promote continuous and widespread innovation processes</td>
<td>Voucher for the access to services (including patenting) and tutoring (for aspiring entrepreneurs and new entrepreneurs)</td>
</tr>
<tr>
<td>• Increase of the diversification in terms of products and services</td>
<td></td>
<td>Incentives for networks of enterprises (open to the trans-regional and international dimension)</td>
</tr>
<tr>
<td>• Increase of the efficiency (productivity) of the regional SMEs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Increase of competitiveness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Improvement of the quality of life</td>
<td>5. Develop new systems of services</td>
<td>Innovative public procurement</td>
</tr>
<tr>
<td>• Increase of attractiveness of the territory</td>
<td></td>
<td>Integrated strategic projects (negotiated programming)</td>
</tr>
</tbody>
</table>
effectively support and increase competitiveness of SMEs and leverage on endogenous knowledge and talents.

Financial instruments, and particularly public–private venture capital funds, are key policy interventions to accelerate access to markets, capitalize existing companies, and boost internationalization contributing, within a sound regional ecosystem, to regional development. Their revolving nature and capability to engage on private resources allows long-term sustainability, multiplier effect and orientation to market. In addition, especially when dealing with early stages, financial instruments such as co-investment funds, are able to bring in not only financial support but also managerial competencies, access to services and fast track to global clients.

Co-investment fund is an investment mechanism that results from a public–private partnership between the public body and business angels for investments in early stage start-ups Figure 3.

- Co-financing schemes, where private investors can participate only at the level of the fund, demonstrated to be less attractive for private investors, more interested in a direct participation in the target company through a mechanism of co-investment, as introduced by the new ERDF “off-the-shelf” regulation;

- Local Investors Networks: to maximise capabilities of sustaining the growth of target companies and attracting private investors on a deal by deal basis, as prescribed by the new off the shelf regulation, it is key that the management company has strong connections with the business angel community and more in general private investors, both at local and at national level.

What should be taken into consideration from the RIS3 experience to do things better next time?

The RIS3 concept had the merit of bringing the issue of the regional R&I ecosystem under the radar of a lot of stakeholders at national and regional level. However, at the end of the day, it ended up with a more or less good strategy on paper, even if the realism of the strategy has to be put into question and if the implementation tools (policy mix or budget) are weak or look like a “business as usual” type.

Most of the RIS3 stopped their work after the first two or three steps of the process (see RIS3 Guide). As a consequence, the SWOT analysis identified the same generic priorities in most of the EU regions because they clustered priorities in a few big blocks of sectors and so lost the sense of competitive advantages at niche level.

The EDP is often a policy one and not an entrepreneurial centric one.

Very few RIS3 provide figures regarding the entrepreneurial dynamics: number of start-ups created, spin-off brought to life, revenue from licensing research results, new products introduced on the market, volume of investments from business angels and VCs attracted by local enterprises, number of enterprises engaged in true internationalisation actions, etc.

Most of the RIS3 have been designed in a closed environment, i.e. without an out-bound vision, without any international considerations or without true synergies with other EU policies (H2020, COSME,…). Few of them looked at the “stairway to excellence” perspective by assessing how past (ERDF) investment can contribute to support the current RIS3 priorities. In practice, the international dimension of the RIS3 is only about the support to export. No RIS3 discusses the offset of regional assets and knowledge due to global competition or breakthrough innovation as well as the lack of investment in the modernisation of the production facilities of local enterprises. Few RIS3 recognise the need of knowledge absorption by local SMEs to remain competitive.

In some cases, priorities are not in line with the findings of the SWOT analysis with the RIS3 losing its evidence base.

- Unique example of a public–private partnership involving business angels clubs, business incubators, accelerators, corporate ventures, etc.

- Investments are made on a deal-by-deal base (key to leverage at its best the contribution of the private sector);

- Co-investors are independent in their investment decisions: they are free to choose to co-invest together;

- Investments are matched on a pari-passu base;

- Funds are managed by a private management firm; and

- Due-diligence can (not mandatory) be performed jointly.
Smart specialisation, the European approach to research and innovation support

How can biotech be an asset, if there are no or very few investments by venture capitalists in the industry and no creation of spin off from the university and research centres and the region has to face a brain drain of its most talented people.

Too little attention is given to the various types of innovation. Incubators and clusters are still seen as a ‘safe harbour’ for the creation of competitive advantages in the region without providing evidence of their past capacity to deliver high added-value support services and regional intelligence regarding new markets or new technology diffusion amongst the local SME communities.

Very few RIS3 are looking to the capacity of the eco-system to accelerate the commercialisation of research results, the creation of innovative enterprises and the absorption of those results by regional SMEs.

Most of RIS3 have few horizontal priorities which often favour cross-sector or cross-disciplinary collaborations. These types of collaborations are today one of the strongest drivers of innovation.

Not enough RIS3 are discussing the contribution of new support service tools in favour of innovation: pre-commercial procurement, KETs, robotic, 3D printing, first client search, demo centres.

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Policy Partnership on Science, Technology and Innovation

The APEC Policy Partnership on Science, Technology and Innovation (PPSTI) supports the development of science and technology cooperation and effective innovation policy in APEC economies. It serves as APEC’s primary forum to engage government, private sector and academia in joint scientific research. Its strategic aim is to enhance economic growth, trade and investment opportunities, as well as social progress, in harmony with sustainability. The PPSTI will seek to develop an enabling environment for market-based innovation policy that supports commercialization, promotes innovation capacity, and facilitates cooperation among APEC members.

Among other activities, the PPSTI works to:
• Strengthen collaboration and enhance member economies innovative capacity
• Develop science, research and technology cooperation
• Build human capacity
• Support infrastructure for commercialization of ideas
• Develop innovation policy frameworks
• Foster an enabling environment for innovation.

Some highlights of selected initiatives under PPSTI include:
• White Paper on Internet of Vehicles outlining a development strategy for promoting the Internet of Vehicles (IoV) in the region;
• Initiative on Toward Innovation-Driven Development;
• 2015 ASPIRE (APEC Science Prize for Innovation, Research and Education) Prize, an annual award which recognizes young scientists who have demonstrated a commitment to excellence in scientific research;
• APEC Research and Technology (ART) Program which focuses on identifying science, technology and innovation issues and formulating policy solutions; and
• Development of Methodology and Analysis of STI Cooperation in APEC Region.

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