



Recommendations for establishing a future EU-India Joint House for Science and Innovation

Final report of the INDIA SI HOUSE project, co-financed by
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Executive Summary

This final report, culminating the two-year feasibility study based on the Indo-French Center for the Promotion of Advanced Research, proposes recommendations for the creation of an 'EU-India Joint House for Science & Innovation' ('SI House') dedicated to facilitate and enhance science-technology-innovation (STI) collaborations between India and Europe. While complementing and building on existing bilateral STI cooperation between European nations and India, the House will focus on strengthening multilateral collaboration, and increasing visibility of European science in India and Indian science in Europe.

The guiding principles for the future SI House are:

1. Attractiveness, flexibility, transparency and sustainability;
2. Equitable representation of stakeholders in Europe and India: funding, members in committees;
3. Simple and efficient procedures;
4. Fund multilateral activities in all sciences, including humanities and social sciences;
5. Focus on innovation and industry participation.

The scenario retained for the future SI House is a physical European-Indian structure with a dedicated secretariat, co-located in both India and Europe, which incorporates the key advantage of a virtual platform, i.e. flexibility and variable geometry for participating funders. It should be governed through equitable representation of stake-holders in committees with Indian and European co-Chairs.

The recommendations presented in the report, which take into account both the “top-down” political willingness and the “bottom-up” perceptions of scientists, entrepreneurs, funders and policy makers in both regions, are thus 'demand driven'. The main recommendations are:

- ✓ a SI House with multi-layered activities with funder participation on a voluntary basis; each activity launched by the SI House would require minimum participation by public or private organizations from two different European countries and India;
- ✓ a guaranteed continuous funding mechanism for the SI House covering basic core functions, like the development an online portal of all Indo-European collaborations, funding sources, partner search tool;
- ✓ beyond basic core activities, a corpus fund and equitable participant sharing of administrative expenses, coupled with virtual common pot model for project funding according to the “*juste retour*” principle;
- ✓ a single entry-point repository and disseminator of information about Europe-India STI cooperation through mapping research activities, resources and engaging in extensive networking;
- ✓ a SI House that functions as an umbrella platform, creating synergies between India and European countries by coordinating programmes with funding agencies and other stakeholders;
- ✓ a double-entry for the SI House’s programming: 1/ bottom-up scientific ideas (open programme) and, 2/ focus on societal challenges and global concerns that are beyond the scope of bilateral endeavours;
- ✓ tailor-made processes for launching multilateral networking and mobility programmes or joint calls for proposals;
- ✓ the coordination of joint calls through a single channel of communication, based on applications, joint peer-review of proposals and joint scientific reporting;
- ✓ a SI House in which industry takes part at all levels, both as funders and as participants;
- ✓ with a strong innovation focus and industry participation in governance and activities, the SI House should promote public-private-partnerships through integrated R&D projects between research institutes and industry.

Table of Contents

| | |
|---|-----------|
| 1. Context | 5 |
| 1 Highlights of the project's findings | 7 |
| 2 Rationale for the House | 10 |
| 3 Recommendations..... | 11 |
| 3.1 Activities | 11 |
| 3.2 Structure Scenarios..... | 13 |
| 3.3 Implementation | 16 |
| 4 The next steps: recommendations to go forward..... | 19 |

1. Context

The European Commission (EC) co-funded an international Indo-European consortium of nine organizations to carry out an ambitious two-year feasibility study¹ for the creation of an 'EU-India Joint House for Science and Innovation' ('SI House') dedicated to the sustainable strengthening of science-technology-innovation (STI) collaborations between the European Union (EU) Member States and Associated Countries (MS/AC) and India. This study was based on the Indo-French Center for the Promotion of Advanced Research (CEFIPRA)², a bilateral platform which was formed in 1987.

To determine the feasibility of such an ambitious enterprise, the consortium explored:

- the current political and scientific context for Euro-Indian STI collaborations;
- the associated political and scientific willingness for establishing a dedicated 'SI House';
- the available legal structures and best practices for establishing the 'SI House'.

This exploration was initiated by an analysis of existing reports relating to Indo-European STI cooperation and, in particular, those obtained through recent EC initiatives (SFIC, New Indigo, etc.). This initial work was then enriched through specific actions and tools put into place to address one or more of the above points of view. In particular, the consortium used:

1. Policy framework analysis of India's 12th Five Year Plan and the EC's Horizon 2020 program to determine the level of complementarity or overlapping of the EC and India's political vision for S&T;
2. An analysis of the EC's 7th Framework Programme (FP7): the EC's dedicated actions with and toward India to gauge its political actions towards India, as well as India's overall implication in the FP7 to contextualise its thematic interests, network of European partners (public and private) and Europe's attractiveness for mobility;
3. A mapping of bilateral and multilateral STI collaboration programs between EU MS/AC and India to quantify the dynamic of the existing political will and acts of India and Europe at the individual country level and to analyse the different legal frameworks used;
4. A study of foreign direct investment in India and its STI character to analyse the country's openness to international collaboration, in particular, in R&D;
5. A bibliometric analysis of Indian and European STI output (research papers and patents) to determine the scientific position, strengths, weaknesses and niches of excellence in the two regions, and to identify key actors in existing Indo-European science and technology;
6. A benchmarking plus Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis of seven selected "successful" organizations or programs currently engaged in international STI collaboration with India. This analysis provides key information about best practises concerning legal and administrative issues and tools as well as on the format and missions of the future SI House. Lessons can also be learnt from those aspects that are not optimal in these programs.
7. A study of existing Public-Private Partnerships (PPP) models in STI collaborations and, in particular those initiated by the EC, for determining best practises in involving the private sector in the SI House;
8. Identification and assessment of barriers impeding STI collaboration between the two regions, to identify hurdles that need to be addressed by the future SI House;

1 INDIA SI HOUSE project [Grant agreement n° 295060] retained in response to the call FP7-INCO-2011-8 under the 'Coordination and Support Actions'.

2 See <http://www.cefipra.org/>

9. An online survey directed at targeted European and Indian science administrators, researchers and enterprise leaders. The survey provides key stakeholder input on the scope and needs for enhancing Indo-European STI collaborations, the themes and activities of interest, the support for a joint SI House, as well as prospective operational models for this House;
10. Open-ended interviews of key personalities associated with Indo-European STI collaboration, as well as of leaders of Indian small-medium enterprises were carried out to delve deeper into issues potentially seen as problematic for enhancing STI collaborations;
11. Workshops and round-tables with the project's External Advisory Board and other external experts were organised to obtain high-level stakeholder input on what the future SI House could look like and how it could function.

This report provides recommendations for the creation of an EU-India Joint SI House based on the above methodology, investigations and findings. These recommendations, founded on two scenarios, take into account both the "top-down" political willingness and the "bottom-up" perceptions of scientists, entrepreneurs, funders and policy makers in both regions. They can therefore be considered as 'demand driven'.

As planned in the Description of Work, this pilot feasibility study and its methodology and approach can become a tool to inspire similar coordinated actions with other third countries.

1 Highlights of the project's findings

The investigations carried out highlighted the fact that Europe is not visible as an STI powerhouse in India, nor is it perceived as one single entity. This co-exists with the fact that amalgamated EU is India's largest trading partner. One challenge for the joint SI House is therefore to create a common European face towards India that will be recognizable, that will emphasize and promote the qualities of Europe in research and innovation. India, on the other hand, also does not have an attractive profile in Europe for research collaboration. So there is a complementary second challenge to build a better image of India in Europe and, in particular, to provide European researchers with more information about India's current and future strengths in research and innovation.

Political inclination

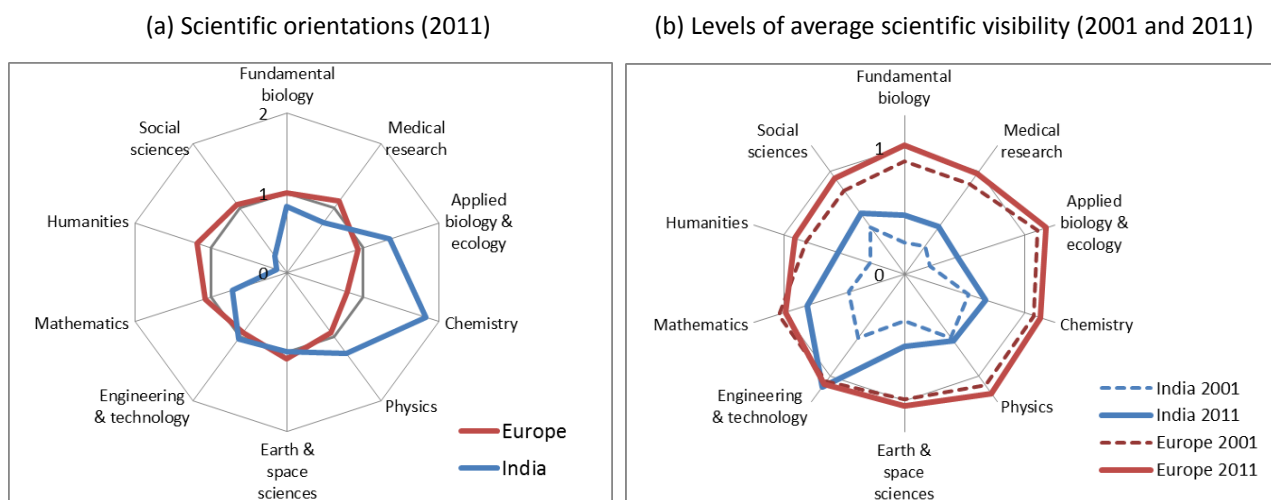
- At the STI collaboration level, a strong political will to enhance Indo-European STI collaboration exists both in Europe and India. At the country level, the vast majority of EU MS/AC has signed STI cooperation agreements with India, essentially within the last 20 years. The EC itself signed such an agreement in 2001 and has, ever since, multiplied initiatives towards India with an acceleration since 2008. And political acts have followed the political will on both sides. An analysis of about 35 recent Euro-Indian STI collaboration programs shows that India is capable of matching the EU MS/AC funding (about 25 million € per year) or that of the EC, when considering the Coordinated Calls of the FP7.
- From a total R&D expenditure point of view, India has the potential to increase its participation. By the end of the decade, the EU intends to increase R&D spending from the present 2% of GDP level to 3%. Likewise India aims to increase its R&D spending from 1% of GDP to 2% mainly through increased private sector participation in research activities. This broods well for EU-India STI collaboration. Current science expenditure of the Indian central government is about 4.9 billion € a year, which in absolute terms is about 43% of the Horizon 2020 yearly budget (or a significantly higher share when reasoning in purchasing power parity terms).
- And finally, to match its financial potential, India's political will is towards increasing openness to foreign collaboration, in particularly in the field of R&D. Foreign direct investment (FDI) into have picked up considerably since 2004-2005. Between April 2000 and December 2013, cumulative FDI in the country was more than 227 million €, with about 10% being for R&D. It is estimated that over 750 R&D subsidiaries of multinational corporations employing 200,000 researchers or technicians exist in India. The European foothold in India accounts for more than 40% of these companies. India's status has changed also; FDI in R&D used to be for organising low-end R&D to support product introduction into the Indian markets. Now, in acknowledgement to India's increasing STI prowess, much is geared towards global product development efforts.

Scientific potential

- The bibliometric analysis of the scientific potential of Europe and India show that Europe is a dominant (about 35% of publications worldwide) but receding world scientific player, receding like the vast majority of the industrialized world. India, on the other hand, is an emerging dynamic country. It has increased its world share by more than half in 10 years, to reach over 3% of publications worldwide.
- Moreover, (figure 1(a)) India is specialised (scientific orientation greater than 1) towards some of the hard sciences (especially chemistry, physics and applied biology-ecology), whereas Europe, as a whole, does not show any particular strong scientific orientation (despite the individual scientific orientations

of the 30 odd countries that make up this region). As for scientific visibility, (figure 1(b)), on average European publications are cited about a little more than the world average (grey line equal to 1), whereas India’s publications are significantly less cited on average. However, India’s citation rates have increased considerably within the last 10 years for most scientific fields. Deeper investigations showed that despite India’s limited average scientific visibility, it has local niches of excellence in all fields: there are research laboratories in India that produce highly cited publications (that is, Top 10% of most cited publications worldwide) in all fields of science. So globally highly visible Europe does have good scope for collaborating with emerging and dynamic India, as niches of excellence exist.

Figure 1: scientific orientation (2011) and average scientific visibility (2001, 2011) of India and Europe by scientific field



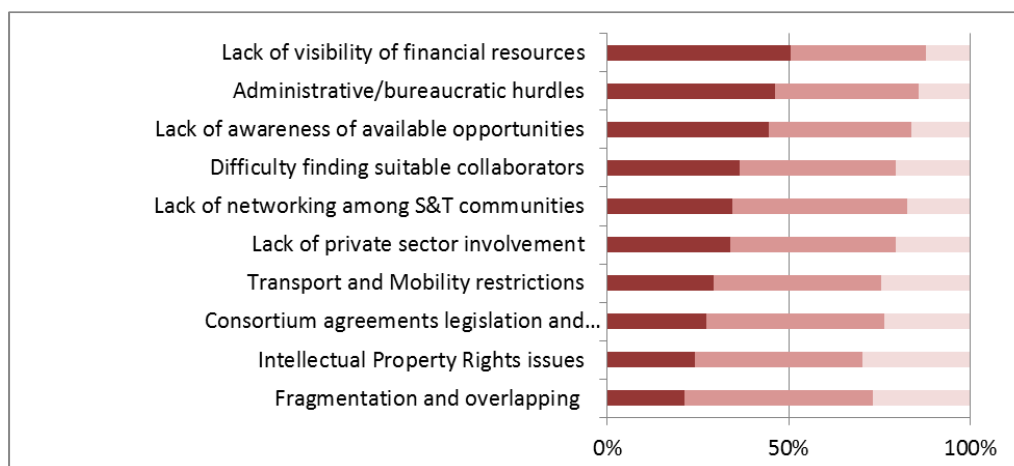
Data: Thomson Reuters, computing OST (see Deliverable 2.2/4.1)

- From a collaboration point of view, Europe as a region is India’s leading co-publication partner, in front of the USA and other Asian countries: European countries are involved in over 40% of India’s international co-publications. On the other hand India remains a modest partner for European countries: it is generally involved in between 2-6% of the international co-publications of European countries. While this is modest, it must be stressed that India’s attractiveness as a scientific partner for Europeans has vastly improved. Its share in all European co-publications has more than doubled in the last 10 years. India’s participation in 159 collaborative research projects (to end 2012) of the FP7 confirms its anchorage in European research networks.
- Analyses showed that innovation-based collaboration has largely been neglected in EU-India STI cooperation to date. Moreover, this cooperation cannot be upgraded without innovation becoming a central feature of the collaboration landscape. Both Europe and India engage in their own type of innovation, based on their own particular ecosystems to foster these innovations. Europe's strength lies in its clusters, while India's forte is frugal innovation. The creation of programmes and mechanisms for collaboration between European and Indian innovators would benefit both and bring STI collaborations to new heights.

Stakeholder interest

- The analysis of the 300 responses to the dedicated SI House online survey showed that Indian and European stakeholders both express very similar opinions concerning the enhancement of Indo-European STI collaboration. Being essentially research scientists or from businesses, their views reflect more those of the operational level as opposed to the administration or policy level.
- While there was very strong support from both the European and Indian scientific communities to an increase in the level of STI collaboration between the two regions, they also highlighted the importance of certain barriers that must be overcome to do so (see figure 2). Early stage issues, like lack of awareness about opportunities or finance, or about the other community, together with complex application procedures or burdensome financial reporting are deemed as being most damaging to STI collaborations. Later stage consortium level issues, like IPR, are seen as less problematic. The functioning of the joint SI House needs to be tailored to meet these views.

Figure 2: significance of barriers to Indo-European STI collaboration according to all online survey respondents (high significance = dark colour to low significance = light colour)



Data: INDIA SI HOUSE online survey, 295 European and Indian respondents (see Deliverable 2.2/4.1)

- Stakeholders largely favoured the establishment of a joint SI House as they thought that it could provide the needed “single window” for accessing collaboration opportunities and resources, or for pooling the financial resources necessary for attacking larger scientific projects.
- The majority of stakeholders had a preference for a physical structure, which is seen as more stable, sustainable and visible (thus having more impact) as well as facilitating the guarantee of long-term commitments. On the other hand, the minority support for a virtual platform was largely based on the flexibility that such a model provides. While operational level stakeholders also largely supported the idea of having the private sector participate in the House, they also highlighted potential conflict in IPR or science agendas between the public and private sector.

2 Rationale for the House

Bilateral cooperation between the EU MS/AC and India will continue to flourish as different countries have different strategic agendas and specific needs. This study was built upon the existing bilateral platform CEFIPRA³ which has been successful in sustaining Indo-French STI cooperation for more than 25 years. There are compelling reasons why a new instrument for promoting and enhancing multilateral Indo-European STI collaboration, the 'SI House', should be created:

- ✓ *Meeting Grand challenges:* Acting multilaterally adds scale and ambition to projects. Collective STI is especially valuable for research initiatives that require investments beyond what national STI budgets can support and in assembling a critical mass of scientific talent for large projects.
- ✓ *Efficiencies of scope:* If resources, financial and intellectual, are pooled, cost savings due to specialization and complementarity of resources and skills can be achieved. Multilateral cooperation also helps the cross-fertilization of ideas and intermediate results.
- ✓ *Added visibility:* Europe as a whole needs visibility in India on its STI capabilities. On the other hand Indian STI capacities are also unknown for most European researchers or science-administrators. A dedicated instrument that showcases Europe in India and India in Europe is required.
- ✓ *Single window:* The possibility of accessing more than 30 EU MS/AC from a single window is a prospect that many in India look forward to. Non-familiarity prevents 'new faces' entering the collaboration arena. European scientists also have difficulties spotting and availing collaboration opportunities in India. Knowledgeable and dedicated staff that facilitates Indo-European collaboration is needed in addition to internet information.
- ✓ *Filling the gaps:* Not knowing enough about the STI community of the other side hampers Indian and European scientists interested in collaborating. A structure that provides such information through mapping co-publications, STI communities and networks would provide a great service to mitigate some of the important early stage issues noted by stakeholders.
- ✓ *Increased sustainability:* Funding agencies, both European and Indian, like to have long term funding arrangements. A joint centre that does networking in both regions, which fosters cross-region tie-ups between researchers and innovators that in turn result in collaborations, which streamlines and institutionalizes existing sporadic collaborations would be most welcome in the present fragmented and unevenly developing collaboration landscape. Besides harvesting more value for the same STI investments, it would also provide durability to the present arrangements.
- ✓ *Creating a win-win situation for both regions:* A dedicated joint centre will :
 - optimize international STI spending;
 - obtain added output or capacity development;
 - create a leverage effect;
 - facilitate the human capital development in the best research centres;
 - simplify access to the best laboratories and research facilities.
- ✓ *Enhanced whole innovation chain approach:* Research and innovation collaboration need better interlinking. A single centre for facilitating research and innovation collaboration could provide integrated support across 'the whole chain'. This is particularly significant when Indo-European cooperation moves onto innovation collaboration beyond the existing activities, which mainly focus on networking, mobility and research projects.

³ See <http://www.cefipra.org/>

3 Recommendations

Goal: A dedicated instrument for facilitation of all aspects of science and technology collaboration (with special focus on innovation collaboration) between India and Europe, which seeks to become the single window for the collaboration needs of the research communities in both regions. This House is not meant to replace or substitute bilateral activities between European nations and India. While complementing and building on existing bilateral STI cooperation, it will focus on the enhancement of multilateral collaboration, with a minimum participation of two European countries and India for each activity. The SI House must also strive to project a consolidated image of European science in India while also acting as an emissary of Indian science in Europe.

Principles:

- Attractiveness, flexibility, transparency and sustainability.
- Equitable representation of stakeholders in Europe & India: funding, members in committees, etc.
- Simple and efficient procedures.
- Fund multilateral activities in all sciences, including humanities and social sciences.
- Focus on innovation and industry participation.

3.1 Activities

Recommendation 1.1

The SI House should propose a multi-layered set of different activities that build from best practices and new ideas. It should function as a facilitator (catalyst) for the Euro-Indian STI cooperation and as a source for funding joint Europe-India networking activities, mobility and research projects (see below).

The SI House should be the first-stop common place of interest for all kinds of stakeholders: decision makers, funders, administrators, researchers, industry, PhD students, etc.

Recommendation 1.2

Each organisation from European countries and India (public or private) will be able to choose in which activities they want to participate on a volunteer basis (3 activity levels, see *recommendation 3.1*).

For an activity to be launched by the SI House, the minimum participation should be organisations of two different European countries and India.

Recommendation 1.3

The SI House should connect with national funding agencies in Europe and India and other entities as well as existing EU initiatives towards India⁴ (Inno Indigo & Indigo Policy, Euraxess, European Business and Technology Centre – EBTC, EU-India Social Sciences and Humanities Platform, etc.) in its function as an umbrella platform and the single entry point for Europe-India STI cooperation.

In India, it should create a common European face that will be recognisable and will emphasise the strengths of European research and innovation.

⁴ See <http://indigoprojects.eu/>, <http://ec.europa.eu/euraxess/index.cfm/links/eurRes/india> and <http://www.ebtc.eu/>

In Europe, it should:

- assist European countries' efforts for STI communication and promotion towards India;
- build a better image of India as a STI partner by providing extensive information about India's current and future strengths in research and innovation.

Recommendation 1.4

The SI House should undertake mapping of research, researchers and resources for sharing knowledge and develop a taxonomy of all Indo-European collaborations. This should be easy to find in a web-portal where all the data is centralised with an alert system and constant updating. The portal should have “find an opportunity”, “find funding” and “find a partner” tools.

Recommendation 1.5

Networking is very important - the SI House should create meeting places and be a nodal point where existing networks (European & Indian) can connect to create “smart consortia” or where new networks can be primed. The SI House should bring people and ideas together regularly in large meetings and/or brokerage events on specific focus sectors. It should also organise specific forums for young researchers to create connections at early career stages, and promote inclusivity to involve new sets of researchers from both regions– “make the pool of bidders bigger” – by organising meetings in more remote places.

Mobility should be funded in a multilateral approach - new funding tools for mobility involving several countries should be developed.

Recommendation 1.6

The scientific focus of the SI House should have two complementary aspects:

Bottom-up or open: being receptive to bottom-up ideas and provide scope for accommodating new ideas and new ways of doing things. This implies a potentially broad panoply of research topics, researcher-driven in an approach that is complementary to the EC's Horizon 2020 programmes.

Defined focus themes: by targeting societal challenges benefiting both continents, the House should achieve something that is not possible at a bilateral level, by focusing on large problems based on a high level of ambition and that will be solved with industry participation.

Recommendation 1.7

To define the focus themes, Indian and European researchers (public & private) could be questioned about what big challenges, either scientific or societal, could be effectively answered by an ambitious dedicated Indo-European programme. This would involve them from the start and increase visibility.

The SI House should also define strategic research agendas on topics (e.g. energy, health, water, bio-economy, ICT) prioritised by the EU-India Group of Senior Officials, with input from industry.

Recommendation 1.8

The SI House must support joint research projects of mutual cooperation and benefits based on complementary approaches that create win-win situations for all participants. The added-value of the collaboration should be one of its evaluation criteria at the proposal stage.

Recommendation 1.9

The SI House should promote other schemes complementary to the main activities:

It should have a mechanism for promoting low-budget pre-project studies via a two-stage process. A small funding amount could be provided at the first stage to help take the idea a little further, followed by consequent funding for the most promising ideas;

It should set up Indo-European contests or challenges, for example on a 2-day meeting basis. Seed funding could then be provided to the best ideas.

Recommendation 1.10

Public Private Partnership and Innovation should be a key goal of the SI House. As industrial partnership is essential to lead to the transfer of technologies, the House should aim to broaden industry-academic Indo-European partnerships.

The House must encourage and fund integrated R&D projects between academics-research institutes and industry, with partial sponsoring by companies.

The Indo-European 2+2 funding models⁵ should be used to trigger industry participation.

3.2 Structure Scenarios

We propose two scenarios, a virtual structure and a physical structure, for the format of the joint SI House. A “physical” structure is an autonomous organisation with a dedicated office space and secretariat to manage collaborative programs. A “virtual” platform is a collaborative programme operated virtually through coordinated calls.

Scenario 1: “Virtual” Entity

The governance of the SI House would be tailor-made, according to each activity and the interested participants. As such, programmes can be adapted to special needs of the stakeholders, but also of the sponsoring authorities or co-sponsoring industries etc. The main tool would be an electronic platform with a very light support structure. This, of course, implies that the entity would not be 100% virtual since a small secretariat would still be required to run it (sustainable funding must be found for this secretariat). For each activity launched, MoUs and governance agreements would have to be signed to provide stability and assurance for that activity.

The advantages and shortcomings of a virtual entity, as based on SWOT analyses (based on *New INDIGO & ORA Initiative* case studies), are:

- It is a flexible model which can accommodate a varying number of partners and their specific rules. Since funds stay in the country, and the barriers for participation are low;
- Contact points at the national funding agencies are easy to approach for the researchers;

⁵ Bilateral funding scheme 2+2: in which proposals include collaboration between two academic laboratories (one from each country) with two private industries or SMEs (one from each country as well).

- Efficient financial management as each national funding agency can apply standard processes, no international transfers required, and researchers are familiar with the rules of their national agencies;
- Negotiations for each call are necessary and can be time consuming. Differences in the funding and implementation of the projects of the national funding agencies lead to different conditions for partners within the same project;
- No binding legal framework between national funding agencies (only a MoU or letter of commitment), individual project contracts between national agencies and researchers from their own country, consortium agreements advised but not enforced;
- Different timelines for each national funding agency makes it challenging to establish a common timeline for a call and (if not planned well) can delay the start of the projects;
- The continuity of activities depends on the willingness of the partners (national funding agencies, EC) to fund it, including the management costs. So far, no independent sustainable mechanism has been established;
- Lack of standardized processes might lead to a loss of lessons learnt – especially if the contact officers within the national funding agencies change often;
- Difficult to have high visibility and to recruit other than usual funders, especially industry.

According to the political will, the opinions of experts and the survey results, the virtual entity was less desired by stakeholders. However, it is a good model for multilateral cooperation that must be considered, especially with regard to its flexibility for participating funders.

Scenario 2: “Physical” Entity

The SI House would be a European-Indian Centre with dedicated office space and staff. It should not be a huge organisation, rather a limited but stable structure, with minimal bureaucracy. It should be legally constituted as non-profit society and administered accordingly. It is important to have a strong base in India, but also have a representation in Europe: the executive director should be based in India with a co-director in Europe. The governing body above the executive director should be the EC, participant European countries and the Indian government, based on the Group of Senior Officials model with a variable geometry. All EU MS/AC should be represented in the governing body. The governing board should have two co-chairs, European and Indian. The core staff of the Centre should be both European and Indian and should use external competencies as much as possible.

The advantages and shortcomings of a physical entity, as based on SWOT studies (based on *CEFIPRA*, *IUSSTF* & *NAM S&T Centre* case studies), are:

- It provides simpler program management as all activities and funding are under one roof. Clear financial procedures with transparency (annual audits) and the possibility to receive third party funding (e.g. other funding agencies, industry);
- More long-lasting: memory of previous programmes and lessons-learnt, and trust vis-à-vis partners;
- All the activities such as launch of calls, evaluation, project funding, monitoring is done by the physical centre with well-established procedures;
- The centres have the opportunity to expand their activities with further programs sponsored by industry or other funding agencies in a dynamic way;
- Higher visibility and can be pro-active in reaching out to potential funding organizations and industry;
- Operate within the framework of the overriding establishment agreement of the Centre;

- Core assured funding allows for long-term planning and setting up of future programs;
- Have been shown to be able to raise external funds from both public and private sources to further secure their continuity;
- Difficulty of a small organization to run all operations independently (outsourcing might be necessary) and relatively high operational costs compared to larger organizations. Salary differences make it difficult to hire bi- or multi-national staff;
- Need to maintain their relevance in a changing global setting to justify the operational costs.

A physical centre is the preferred model of almost two-thirds of questioned stakeholders and favoured by the experts consulted who consider that it would be more stable, sustainable and visible, and hence have more impact. They also thought that it would better fill the role of the 'Single window' to EU-India STI collaborations and facilitate long-term political and financial commitments, noting that culturally Indians are more accustomed to working with physical structures and have less confidence in virtual modes of cooperation.

Recommendation on the structure:

Adopt a physical structure for the future joint Indo-European SI House, but taking the strong points from the virtual model to equip the physical structure for multilateral work with many European countries, as well as India – especially regarding variable geometry participation in activities (*recommendation 1.2*), the ability to make “tailor-made” programmes and funding mode (*recommendation 3.3*). The physical structure must remain small but stable so as to maximize the visibility, impact and sustainability of the SI House while limiting the administrative load and providing the most flexible and equitable conditions for carrying out activities. The agreement for the establishment of the SI House must be flexible to allow new schemes and evolution of the structure with the changing context.

3.3 Implementation

Recommendation 3.1

Establish a physical centre with guaranteed continuous funding mechanism for basic core functions and tailor made processes for launching multilateral networking and mobility programmes or joint calls for proposals.

The core funding should involve all countries and cover only core functions, like the development and maintenance of an online portal of all Indo-European collaborations, funding sources, partner search tool, etc. (*recommendation 1.4*).

Beyond that first level, all actors (public and private) from all countries can decide at which level and for which activity they would like to participate, with related entry fees (*recommendation 1.2*). The second level would be participation in Indo-European networking and mobility schemes (*recommendation 1.5*), and the third level would be joint project funding (bottom-up, pre-defined themes, challenges, public-private partnership, etc.) (*recommendations 1.6 to 1.9*).

Recommendation 3.2

At the activities level, the budget for administration should be shared equitably, the suggestions are: an entry fee proportional to a country's contribution to Horizon 2020, a basic fee, or a percentage of the activities (overheads).

Recommendation 3.3

For project funding, each country funds its own researcher and science in a virtual common pot model (not a real common pot). Each national funding agency only funds project participants of their own country (according to the "*juste retour*" principle).

Recommendation 3.4

The SI House will centralise communication to potential applicants and coordinate the joint calls, there should be one common call document complemented by national guidelines.

A user-friendly, interactive internet platform should be used for the whole project submission, evaluation and funding steps.

Scientific reporting of the projects will be coordinated by the SI House, and clear rules must be defined for contractual obligations of funded researchers.

Before funding research projects, Consortium Agreements must be signed by all partners involved. The SI house will provide general guidelines and a model of consortium agreements, including IPR issues, for partners, but this model will not be enforced; the researchers can define their own agreement.

Recommendation 3.5

The scientific selection process is done jointly from the very beginning (without using time consuming parallel evaluations). The scientific evaluation of projects should be based on the peer review of proposals and recommendations made by a scientific evaluation committee.

Recommendation 3.6

The future SI House must have two locations. The main physical centre should be based in India, with a representative office in Europe, preferably Brussels (*recommendation 1.3*). The European antenna would aim to promote Indian STI in Europe in cooperation with the various European stakeholders.

Each antenna serves as a shared facility for interested stakeholders (in India for European stakeholders and in Europe for Indian stakeholders) so as to maximize cost effectiveness and facilitate STI community exchanges.

The EBTC, which already has several offices throughout India, should work closely with the SI House by providing, for example, shared facilities throughout the country (*recommendation 1.5*). The EBTC also has an important role to play in bringing private sector partners to the SI House (*recommendation 1.10*).

Recommendation 3.7

The highest governance level of the SI House should be a Governing Body with representatives from India and Europe, and co-chaired by an Indian member and a European member. All participating countries on the European side should be treated equally and have access to the Governing Board. Given the potentially important number of players, a Bureau or Management Council, with representatives on a rotational basis, could be elected by this Governing Body for the more operational decision-making.

Governance at the activities level will be made by a specific committee for each activity representing all the involved players.

Recommendation 3.8

The core staff of the SI House should be from both India and Europe. In order to have Europeans working at the centre in India, allowance has to be made in the wage structure.

The SI House will be based on a small full-time core team, renewed every three to five year, plus additional staff for shorter stints on a rotational basis, with part-time or full-time positions. One of the key roles of the longer term staff is to ensure that responsibilities are handed over smoothly and to maintain the “memory” of the structure.

Recommendation 3.9

Industry representatives should be part of the SI House at all levels, both as core and activity funders, and as participants in the activities. A key goal of the SI House should be public-private-partnerships, with integrated R&D projects between research institutes and industry (with industrial co-funding).

In order to encourage innovation, a scheme could be imagined for the SI House where a small percentage of each research programme is reserved for innovative ideas that come out of research projects to take forward towards setting up start-ups. This could be based on the model of the European Research Council’s “proof of concept” funding scheme⁶.

⁶ See erc.europa.eu/proof-concept

Recommendation 3.10

An evaluation of the impact⁷ of the scientific research programmes funded or supported by the SI House must be made. To do this, baseline data must be collected from the outset on who is being funded, with whom these researchers are collaborating, what research is being funded, and where the research will be done. After the end of a programme, this information should be linked with data on researcher activities and accomplishments, and the translation of these ideas into outcomes and products. The creation of such a longitudinal database on the scientific enterprise could be based on the example of the US STARMETRICS programme⁸.

The results and analyses obtained from such an integrated scientific database will provide essential input for the SI House scientific strategy but also for global performance evaluations. Indeed, in the long-term, regular external performance evaluations must be planned so as to perform an impact assessment on the work of the SI House, by a high-powered international independent committee.

7 See documents.worldbank.org/curated/en/2011/01/13871146/impact-evaluation-practice and www.cssip.org

8 See www.starmetrics.nih.gov

4 The next steps: recommendations to go forward

- The fact that both the Indian and French Governments agreed to the participation of CEFIPRA⁹, the Indo-French STI platform, in the INDIA SI HOUSE project confirms the political will from both sides to go forward with the concept of a joint Europe-India SI House. In particular, the Department for Science and Technology (DST) of the Indian Government, who is also co-Chair of CEFIPRA, is fully in favour of this new tool for promoting multilateral STI cooperation with European countries, for complementing its existing bilateral cooperation programmes. The DST must be formally approached as a full partner in all future steps and decisions towards setting up the future joint SI House.
- Existing EC initiatives, like the *Inno Indigo* and *Indigo Policy* projects, should take an active role in taking the recommendations of this feasibility study forward with the EC. *Inno Indigo* could provide a roadmap and business plan for starting up the SI House as per the recommendations in this document. This is particularly important as the funding organizations that are now participating in *Inno Indigo* could represent, to a large extent, the future core founders of the SI House.
- The first level of implementation of the SI House is to have a web platform, or web portal, in which the STI activities of all European countries will be posted to provide the first stage of the single window entry point for Indian partners. By symmetry, the web portal would then provide the corresponding information about the Indian STI activities and community for European partners. In the next phase, this web platform would provide a consolidated networking tool for organisations, individuals and projects.
- The SI House web platform could be constructed and enriched from the existing Indigo projects¹⁰ and EU-INDIA S&T Cooperation¹¹ websites. In addition, during a dedicated expert forum, the large Indian IT company, Infosys, stated that they would be willing to help develop the SI House portal. This should be taken forward with them, offering, for example, Infosys increased visibility in the STI community as a type of sponsor of the SI House.
- The core funding for this level one implementation could initially come from the EC as a start-up grant or “activation fund”. This would give the SI House the necessary impetus to take-off rapidly and the EC direct visibility as the chief instigator of this important initiative. From a practical point of view, inspiration could be taken from the German House for Research and Innovation¹² in India, which received an initial grant from the German Government to create the internet platform, to organise working meetings and some travel, and to test the networking instrument. The motivation of the EC to provide this activation fund will stem from the interest explicitly shown in the SI House by the EU MS/AC. In particular, the different MS/AC should highlight their overwhelming interest through existing active EC co-funded initiatives, like *Inno Indigo*, *Indigo Policy*, *Euraxess*, *EBTC*, etc. A concerted group action could also come from the network of Science Counsellors from all European national Embassies established in India, including the smaller countries.
- Once the basis of the SI House has been set up, it would be up to Indian and European countries ministries, funding agencies and industries to provide core funding for the SI House so as to guarantee a sustainable future for these activities.

9 See <http://www.cefipra.org/>

10 See <http://indigoprojects.eu/>

11 See <http://euindiacoop.org/>

12 See <http://www.dwih.in/>