



# ANALYTICAL VIEW OF NATIONAL STI SYSTEM

A STUDY COMMISSIONED BY UNITED NATIONS  
ECONOMIC AND SOCIAL COMMISSION FOR  
WESTERN ASIA (UN-ESCWA)

Amr Radwan  
ESCWA-ETC Consultant





# ANALYTICAL STI SYSTEM

## Section One: National STI system

1. Introductory Insights: The main scene
2. System characterisation and public Governance
  - 2.1. STI Policymaking and the Public actors
  - 2.2. STI Strategies and Technological roadmaps
  - 2.3. STI Funding organisations
  - 2.4. Organisational bodies & advisory boards
  - 2.5. Monitoring and evaluation system
3. STI Main policies
4. National Knowledge-base
  - 4.1 Capacities, productivity and quality
  - 4.2 Industry-Academia Collaboration
  - 4.3 Knowledge circulation
  - 4.4 Cooperation Capacities
- \* Main challenges and barriers

## Section Two: Analytical view of main actors

5. Descriptive overview of the main system actors and the main challenges:
  - 6.1 Incubators
  2. Venture Capital
  3. Science and Technology Parks
  - 6.4 Innovation enablers (Supporting Networks, Technology Transfer offices and Innovation marketplaces)

## Section Three: IPR Management

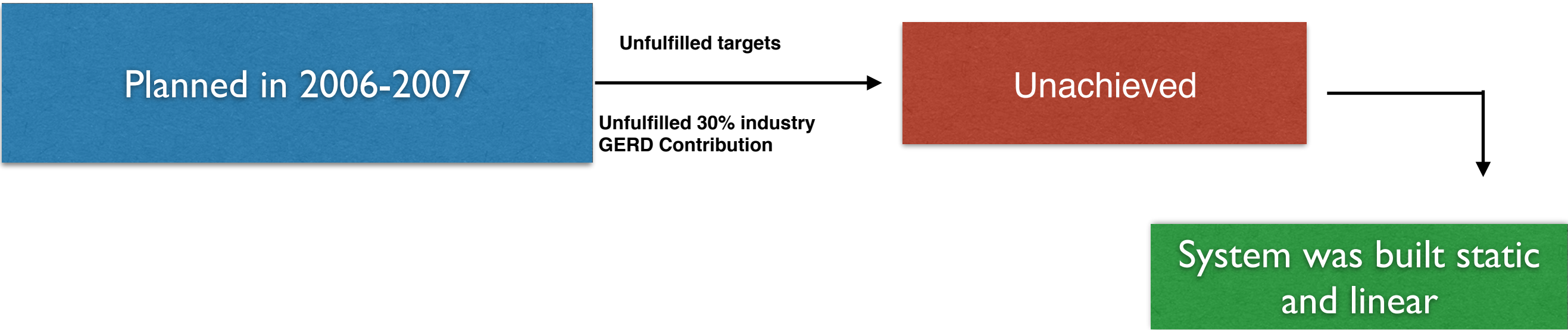
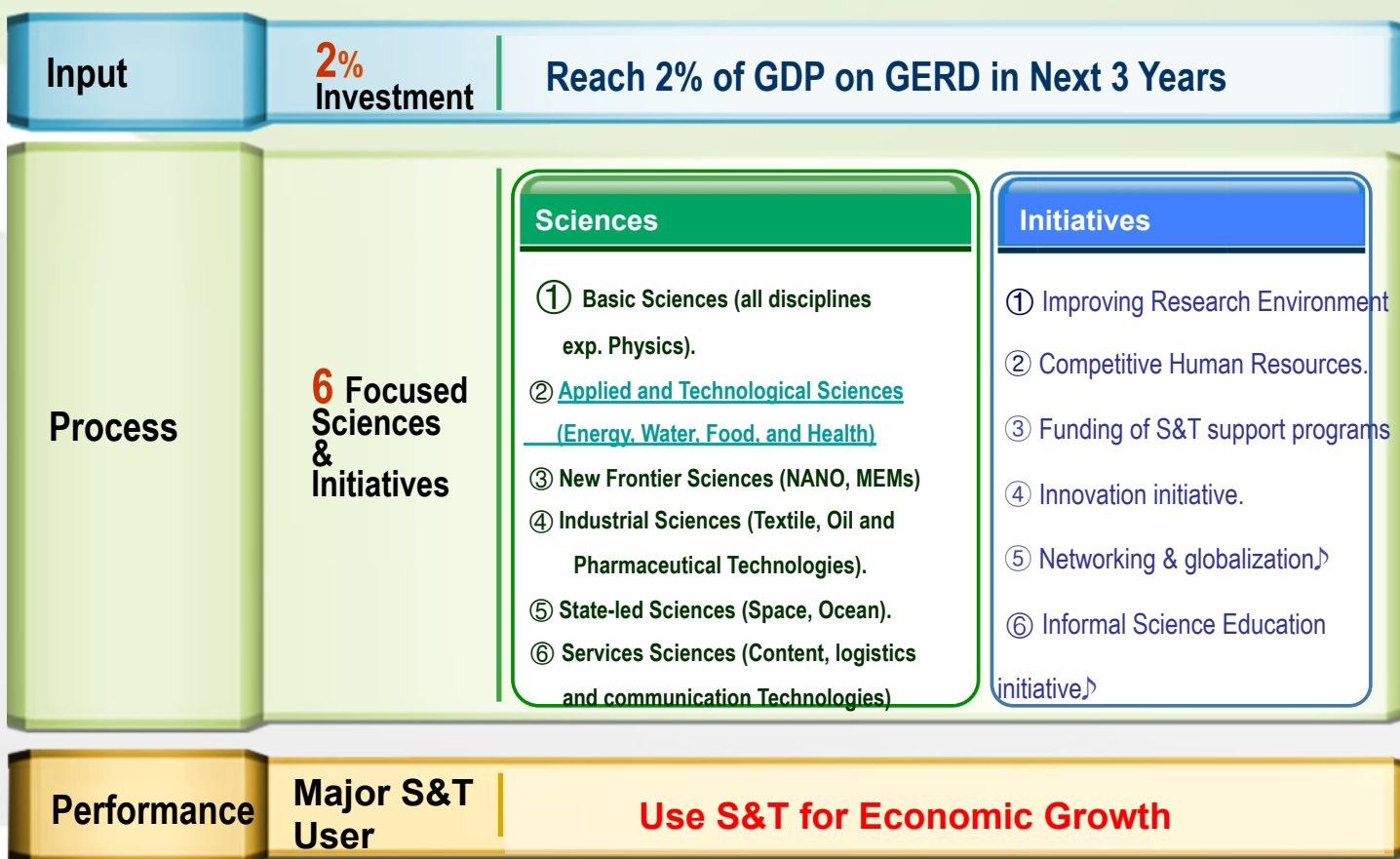
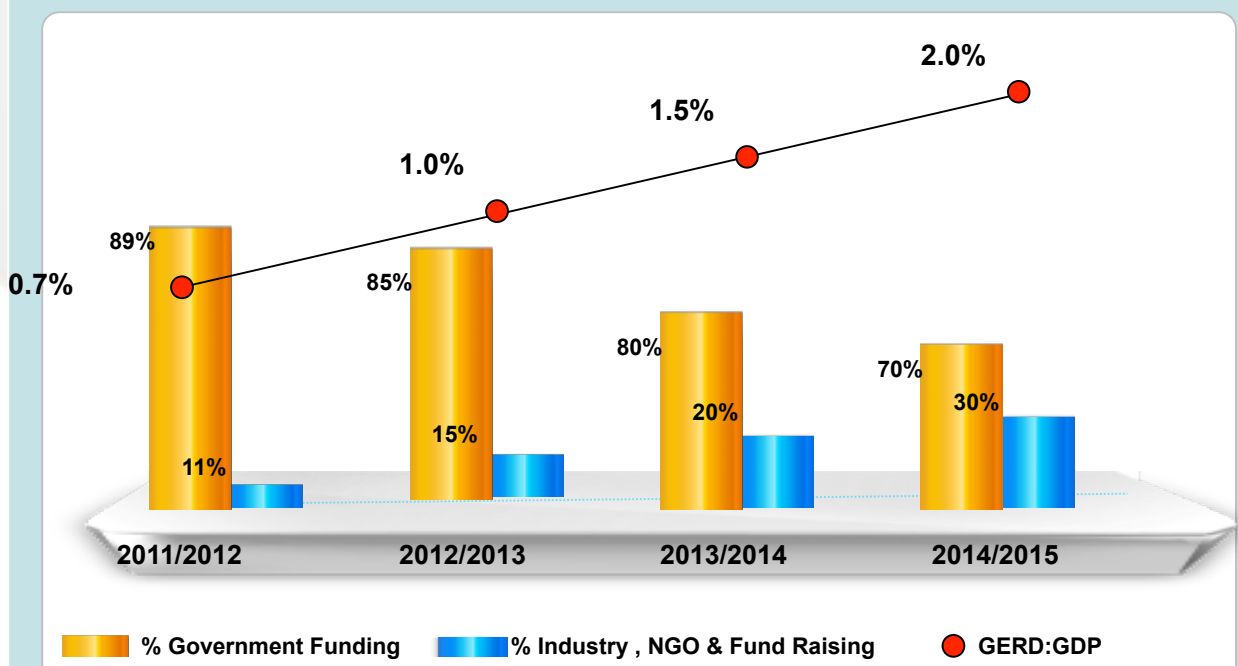
6. IPR Management at the National Innovation System
7. Barriers and challenges
8. IPR Governance in Egypt

## Section Four: Industrial and commercial competitiveness

9. Egypt industrial demographics and competitiveness
10. Innovation capacity within Egyptian enterprises
11. Barriers and challenges

# Framework of Egypt New S&T Initiative

R&D Expenditure in the Egyptian Landscape in 2011/2015

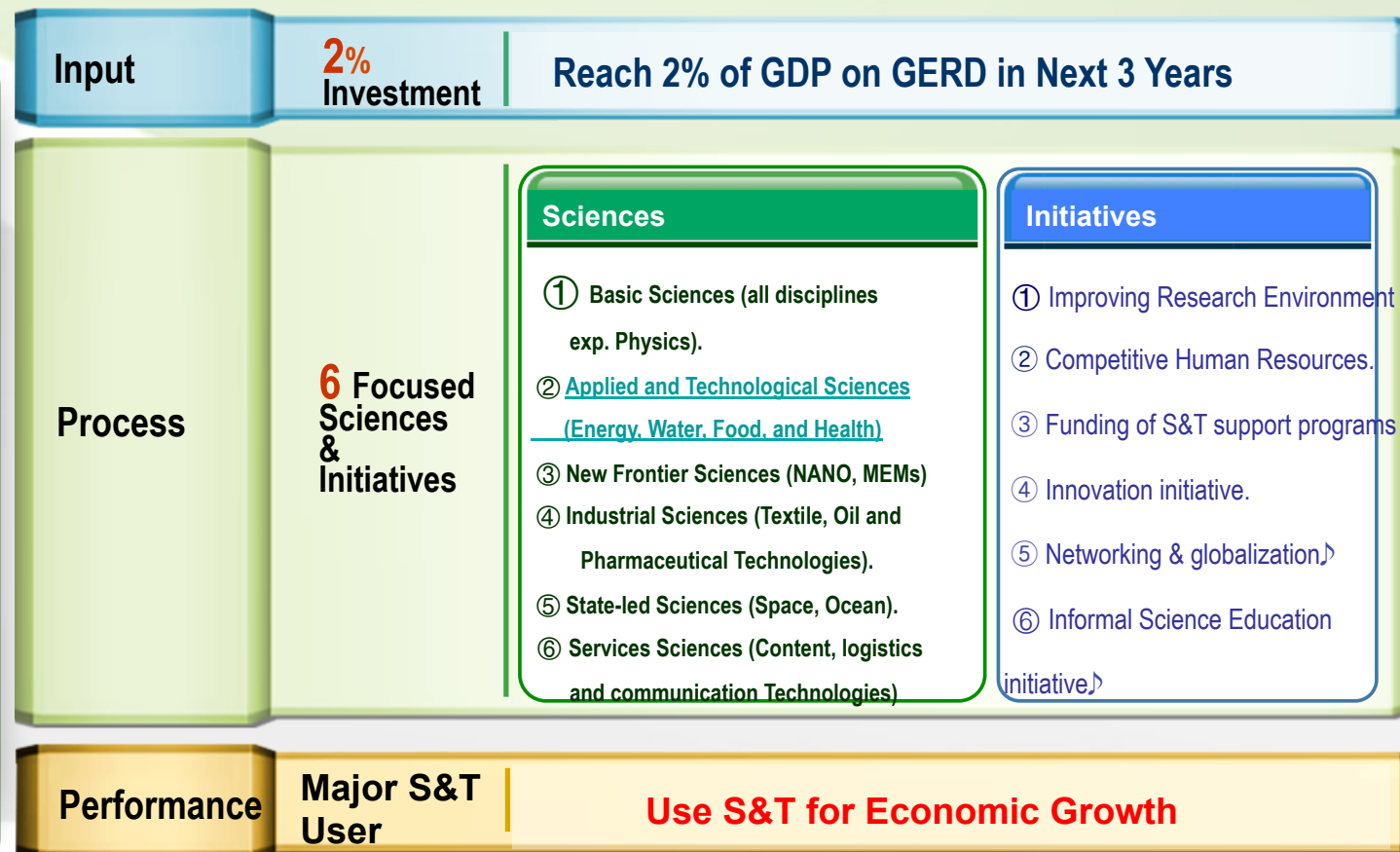




## Framework of Egypt New S&T Initiative

### MAIN KPIS

- Egypt among the top 40 countries in the field of:
  - o innovation
  - o quality of scientific research institutions
  - o retaining innovative talents and capabilities
- Egypt among the top 20 countries for:
  - o the number of patents
  - o Intellectual Property Rights



Planned in 2006-2007

Unfulfilled targets

Unfulfilled 30% industry GERD Contribution

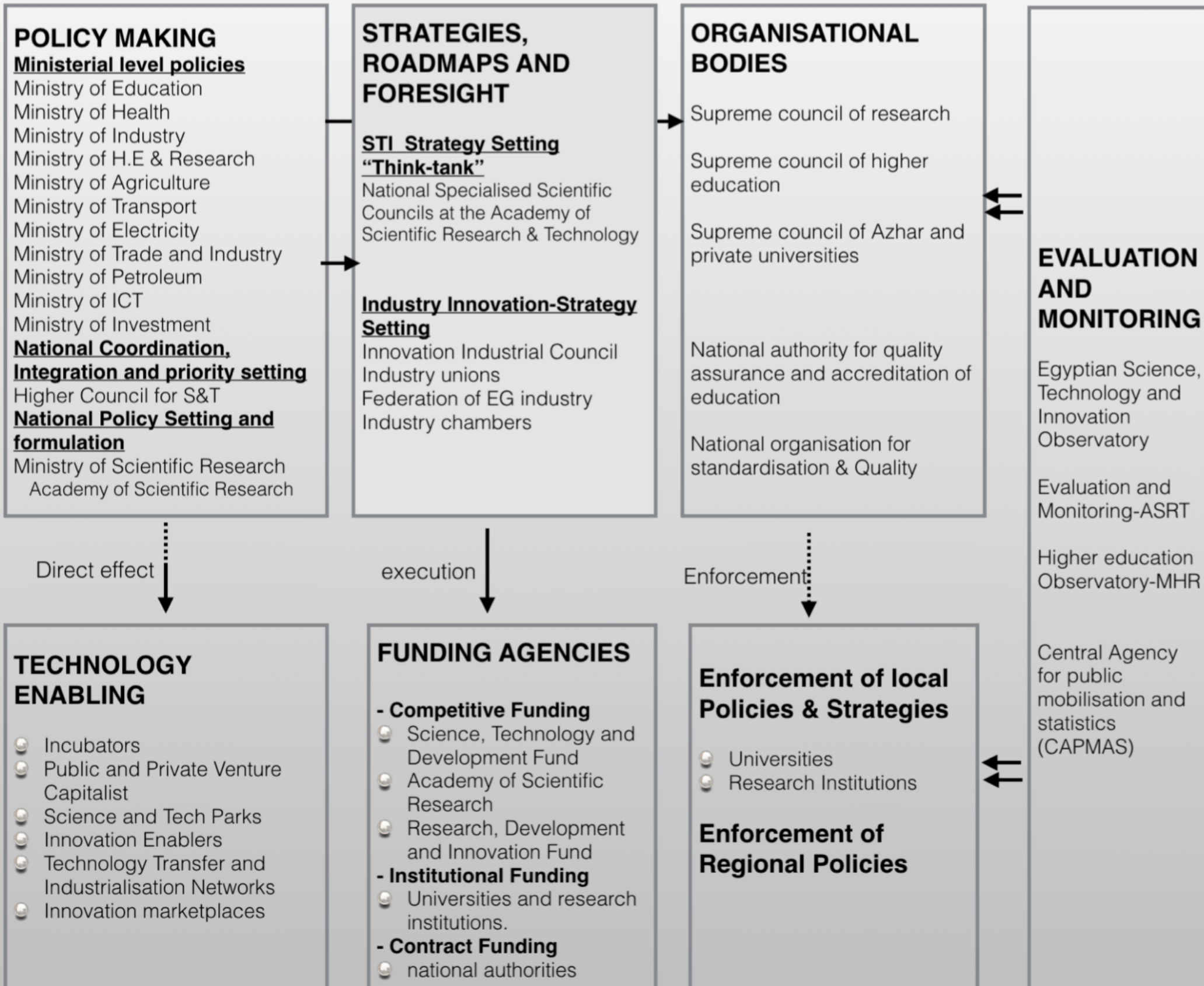
Unachieved

System was built static and linear

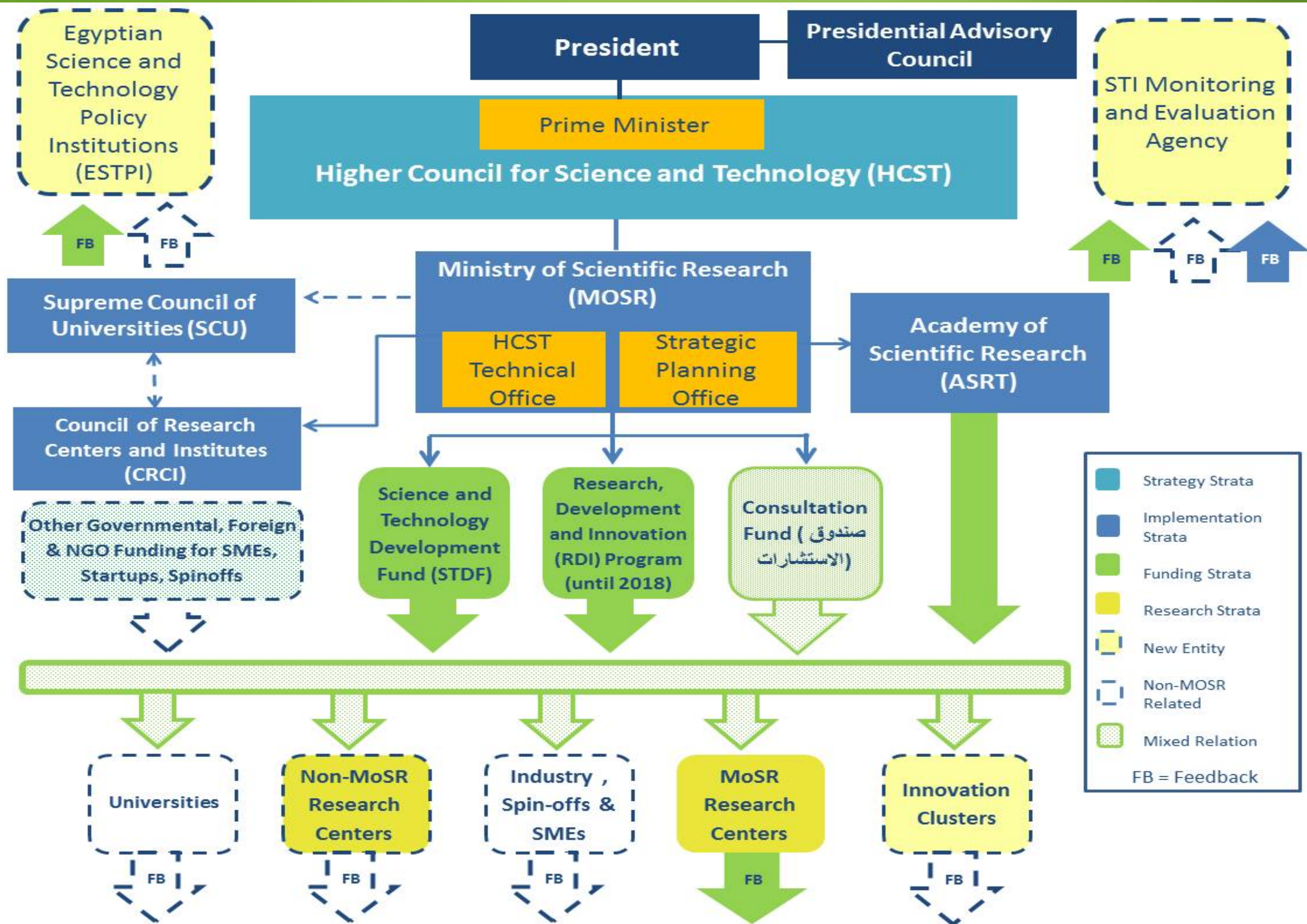


# HIGH LEVEL NATIONAL ADVISORY & STEERING BOARDS

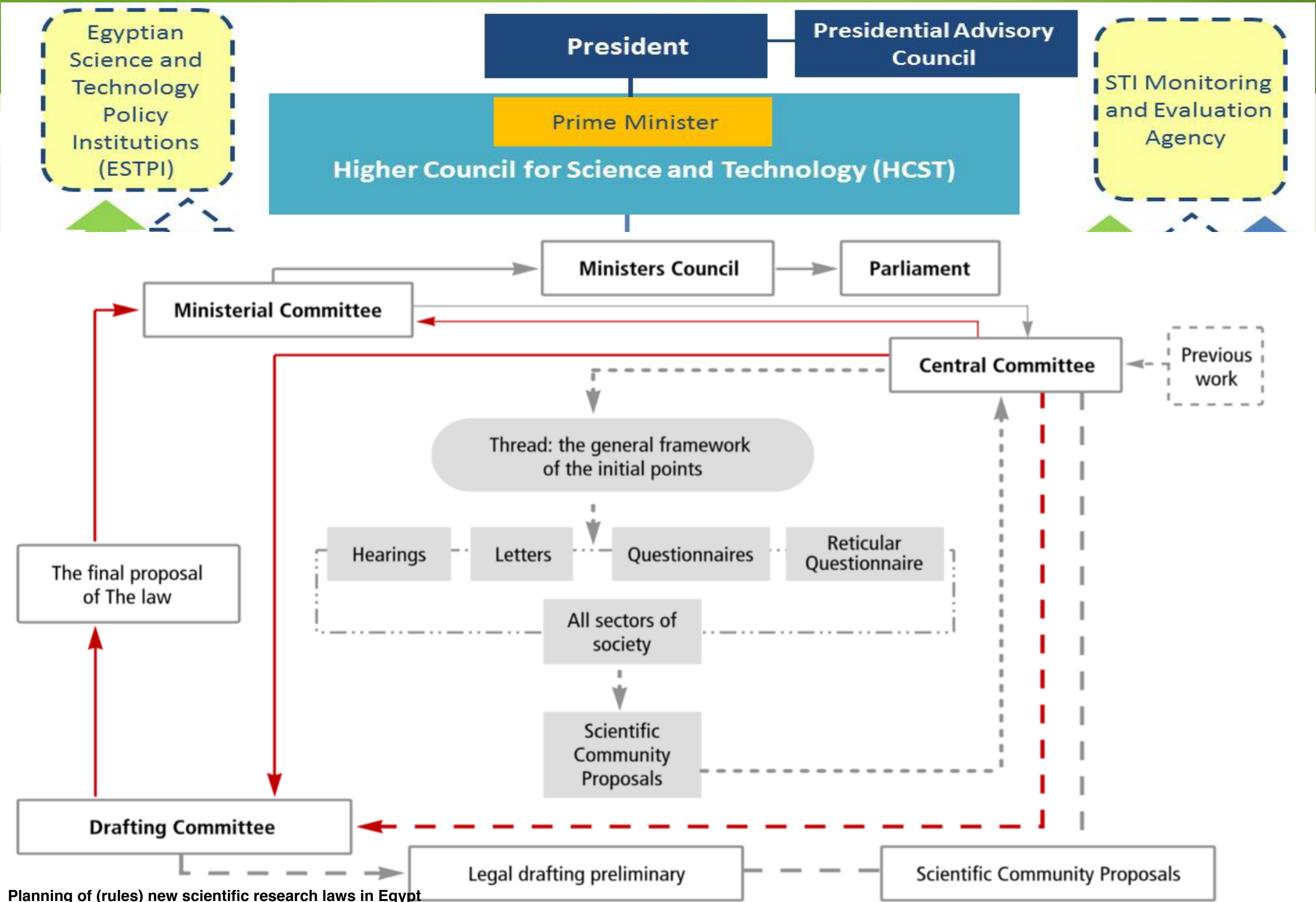
## presidential councils (Education and Scientific Research)


















Planning of (rules) new scientific research laws in Egypt



# Salient findings : STI SWOT Analysis

-  S&T is public dependent, vertical centralised hierarchy. Public financing of research institutions are not based on sufficient evaluation and performance measures, Insignificant alignment of S&T policies at the ministerial level. (HSCT
-  (Cairo Univ state funded by 93%), each research organisation has its own infrastructure funding (under budget line called equipment and instruments), still it doesn't meet the infrastructure gap in many research organisations. Research expertise distribution is indirectly proportional to the existence of good infrastructure
-  Moreover, measures for policy and strategy application by research organisations are missing.
-  Strategies and roadmaps formulated by the specialised councils at the Academy of scientific research and technology are not binding, the same for the policies developed by the Ministry of scientific research. The lack of EBSP at the level of research performers
-  The level of getting policy and strategy in practice is questionable.
-  Gender inequality in vertical and horizontal segregation of women's in science. 42% of PhD graduates in the last 5 years were women and 32% of the graduated women with university degree are unemployed, in general the unemployment rate of women is almost 4 times that of men and even higher than 4 times for youth unemployment
-  0.7% corporate collaboration



# IP MANAGEMENT

- It is not about the system of filing a patent (standardised procedure), it is more about the ecosystem
- 70% to 75% of total patent applications at the Egyptian Patent office came from foreign organisations. Egyptian applicants tend to protect their products and ideas nationally. (EXPATRIATES)
- The management of intellectual property rights at the governmental level is highly fragmented.
  - Enforcement and Economic Court-2009, informal business sector constitutes more 60% of Egypt business sector
  - ▶ Trademarks and TRIPS: Ministry of trade and industry
  - ▶ Patents and Utility models: Academy of Scientific Research
  - ▶ Copyrights: Ministry of Culture + MCIT for computer programs and databases
  - ▶ Plants varieties: Ministry of Agriculture
  - ▶ IP Legislation: Ministry of Justice
  - ▶ International relations, WIPO, negotiation: Ministry of Foreign affairs

State shall establish a competent body to uphold IPR rights and provide legal protection as regulated by law

State guarantees the freedom of scientific research and encourages its institutions as a means towards achieving national sovereignty, and building a knowledge economy” (article 23).

State shall ensure effective means of contribution by private and non-governmental sectors and the participation of Egyptian expatriates in the progress of scientific research.

Article 69 emphasised the importance of IPR protection in all fields.

# IP MANAGEMENT

It is not about the system of filing a patent (standardised procedure), it is more about the ecosystem

70% to 75% of total patent applicants tend to protect their products

The management of intellectual property

- Enforcement and Economic Cooperation sector

- Trademarks and TRIPS: Ministry of Economic Planning

- Patents and Utility models: Academy of Scientific Research and Innovation

- Copyrights: Ministry of Culture + Ministry of Higher Education

- Plants varieties: Ministry of Agriculture

- IP Legislation: Ministry of Justice

- International relations, WIPO, negotiations

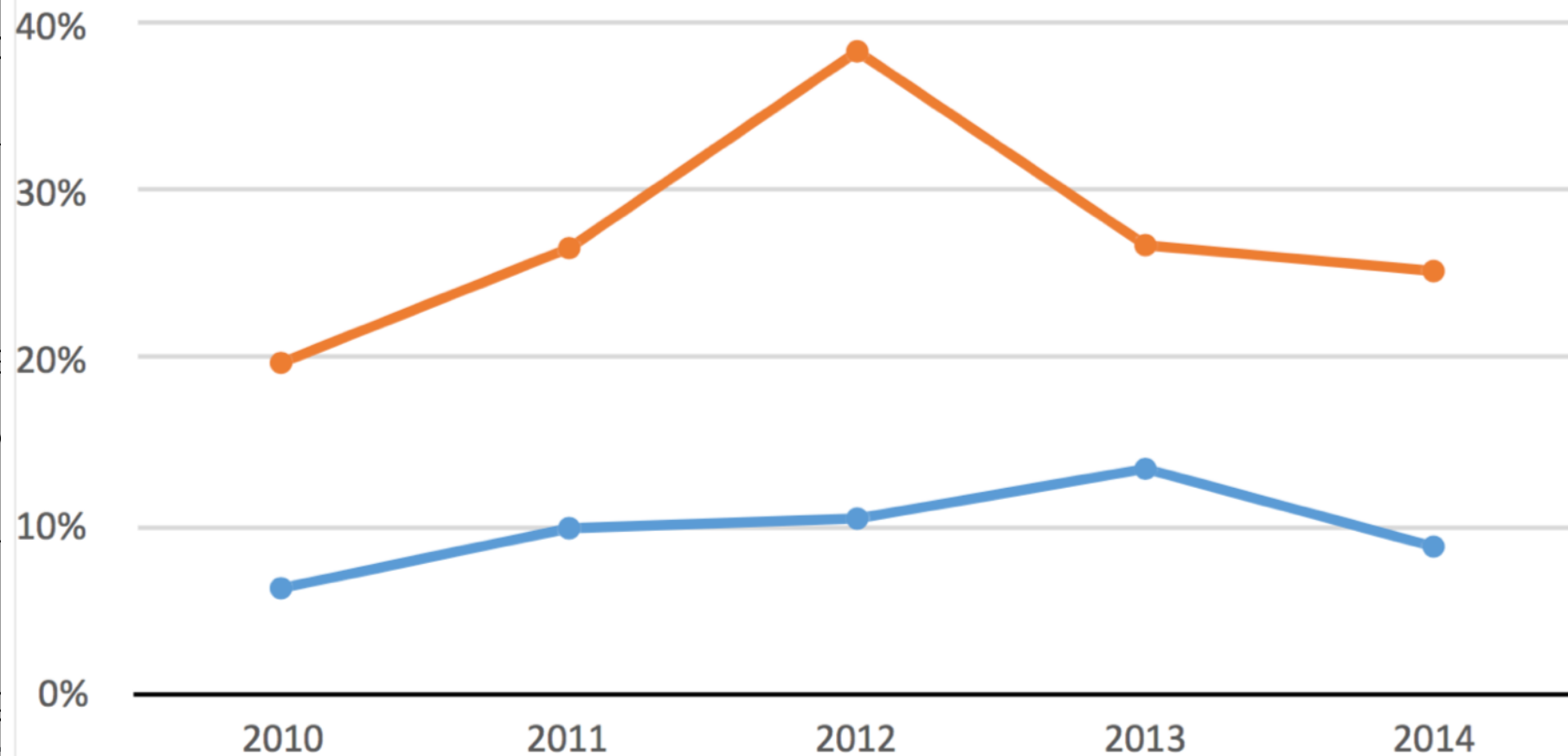
State shall establish a competent body

State guarantees the freedom of scientific research and encourages its institutions as a means towards achieving national sovereignty, and building a knowledge economy” (article 23).

State shall ensure effective means of contribution by private and non-governmental sectors and the participation of Egyptian expatriates in the progress of scientific research.

Article 69 emphasised the importance of IPR protection in all fields.

## Patent Applications' Success Rate



68 EG per year, 421 non EG , out of 700 EG per year, 1534 non EG  
<4% HEI

Success rate of Egyptian Applicants  
Success rate of Foreign applicants

Firms is followed by individuals  
Chemistry, metallurgy & humanitarian needs



## MAIN INNOVATION ACTORS

## Technology Incubators

		Egypt	Jordon	Tunis	Palestine
Technology Incubators	Number of Incubators	21	10	32	2
Venture Capital	Starts on	2010	1997-2013	1999-2010	2000
Local authorities	Themes	ICT(45%), General(2)	ICT(3), Agro- Industry(1), General (6)	ICT(2), Agro-Food (2), Renewable energy & mechanics (2), General (26)	ICT
Business Plan Competition	Status	2 public and 4 private	4 non profit & HEI, 1 private	26 HEI	Independent (private)
Technology parks	Min and Max seed capital fund	Max 75000 EGB	5000-15000 JOD		
Active associations	Current incubates	42	17	344	50
Tech enabling networks	Graduate incubates	24	213	196	42
Specialised clusters	Geographical distribution	Cairo (5) Giza (1)	Amman(4), Irbid(2), Karak(1), Madaba(1), Jersah(2)	Tunis(8), Beja (1), Romana(1), La Marsa(1),Dejreba( 1), Ariana (1),	Ramala (branc in Gaza)



Technology Incubators

Venture Capital

Local authorities

Business Plan Competition

Technology parks

Active associations

Tech enabling networks

Specialised clusters

» **Incubators:** Common services are office space, shared resources, coaching, training, access to tech, professional & Financial networks. (21) 45% in ICT. 80% in Cairo. (1) of these incubators is a university-based incubator.

» Different operational methodologies (services offered in exchange for 10-40 equity share ....possibility of accepting donations)

» **VC:** 25 international VC with main focus on electronics, internet tech, biotech, health related applications and energy.

» 8 Egyptian VC (2005, MOF). 2005-2014, 16 new VC in several tech areas. In general, these VCs are not offering equity finance or angel financial services but also mentoring, counselling and access to networks. 60% of the capital distribution went to ICT.

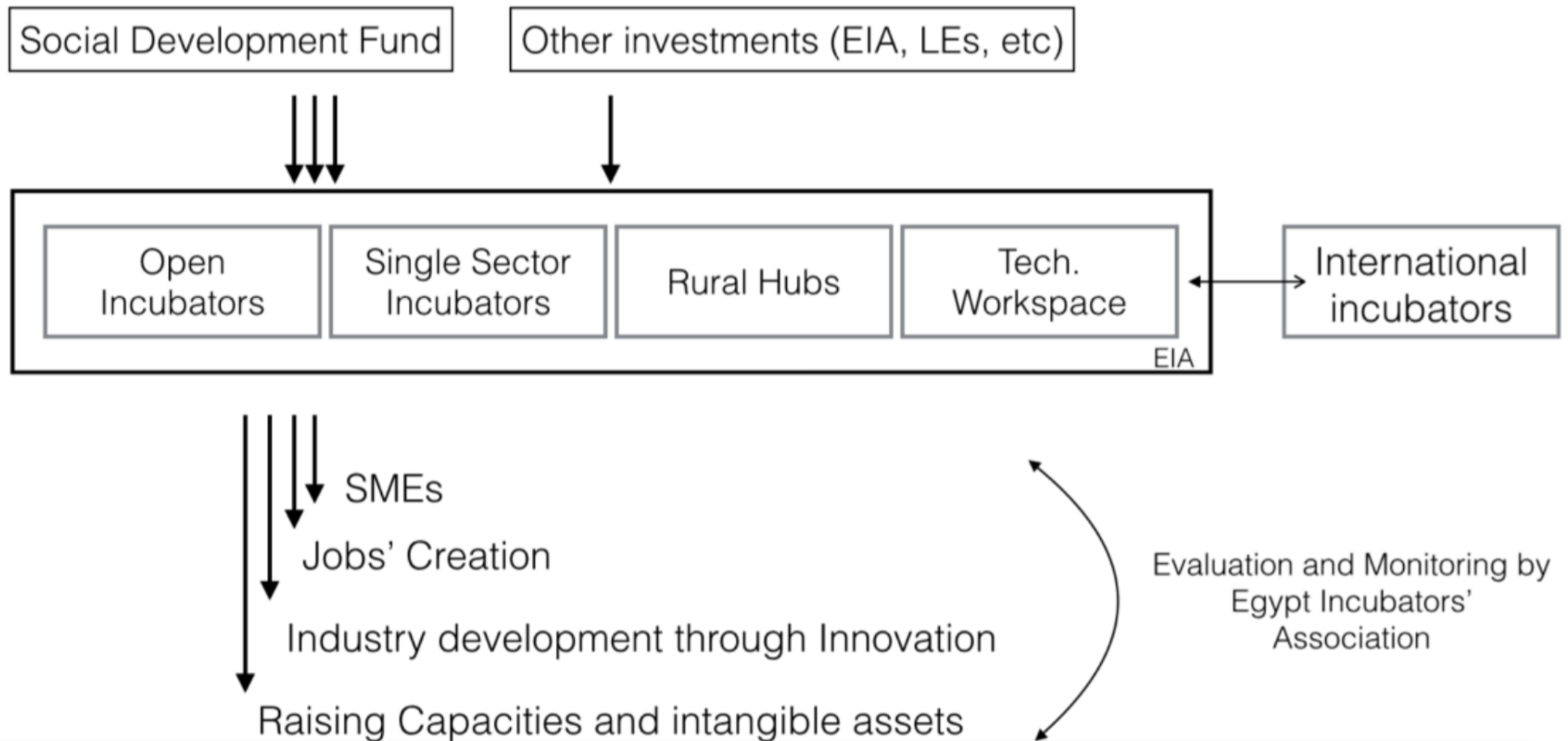
» **Innovation web-marketplace & crowdfunding platforms:** 18 platforms are operating (2 managed by government) where some of them work by stimulating crowdfunding, others run competitions with possibility of equity funding, providing services (networking, matchmaking)

» **Tech enabling public actors:** TICOs, RDI FPs, Egypt Competitiveness Network, Enterprise Europe Network

» 0.7% corporate collaboration


## INCUBATORS AND VCS


The first generation of incubators were implemented in the USA in late 1950. Incubators have been clearly witnessed in Egypt in 1992. And during this time, Egypt incubators benefited from the UNDP initiative that aimed to connect and support several incubators in the region.





Large percentage of generated startups are susceptible to fail due to managerial, financial and technological challenges, these challenges are also facing incubators.




 **SRTA** in 1993 and four technology valleys in **Sinai, Sixth of October City, Nag Hamady and Sohag** (Only the first two were implemented). In 2007 a plan for science parks in Suez Canal area, upper Egypt and north coast tech valley (still in feasibility-studying).

 In 2015, the Ministry of Scientific research announced an ambitious project for empowering **SRTA** with more enhancements to act as hub for technology incubation and acceleration. In addition of hosting several industrial companies and strengthening the links with business sector through SRTA new Investment area, SRTA will host “Egypt startup incubator” with a budget of 10 billion Egyptian pounds.

 **10th of Ramadan city**, it has been located in a strategic place only 25 km away from Cairo airport. Government support has been provided through tax incentives (highest personal tax cut from 32% to 20% and corporate tax rate cut from 43% to 25%), custom incentives measures have been supported as well including reduced tariff from an average of 14.6% to 6.2% and reduced tariff bands from 27 to 6. 10th of Ramadan science park is managed by a Tech park company which is owned by the government (Ministry of Communication and Information Technology).

 **Maadi Technology Park (MTP)** has a convenient location with proximity to universities and commercial centres. MTP was inaugurated in 2010 with major specialisation in ICT and it is owned by Ministry of Communication and Information Technology in Egypt. So far, 11 operating building and 18 companies have been already established in MTP. Further development plan is underway and MTP is expected to be fully functioning by 2017.

 The development of the **new technology park in Borg Al-Arab** is underway as well with total investment of 161 M USD and it will occupy a location on 37,800 square meters. This new park will have the same incentives and government support as 10th of Ramadan city in addition to significant reduced costs and time for companies' registration. Nearby: (1179 firms, 9 billion EGP investment and 92000 workers)

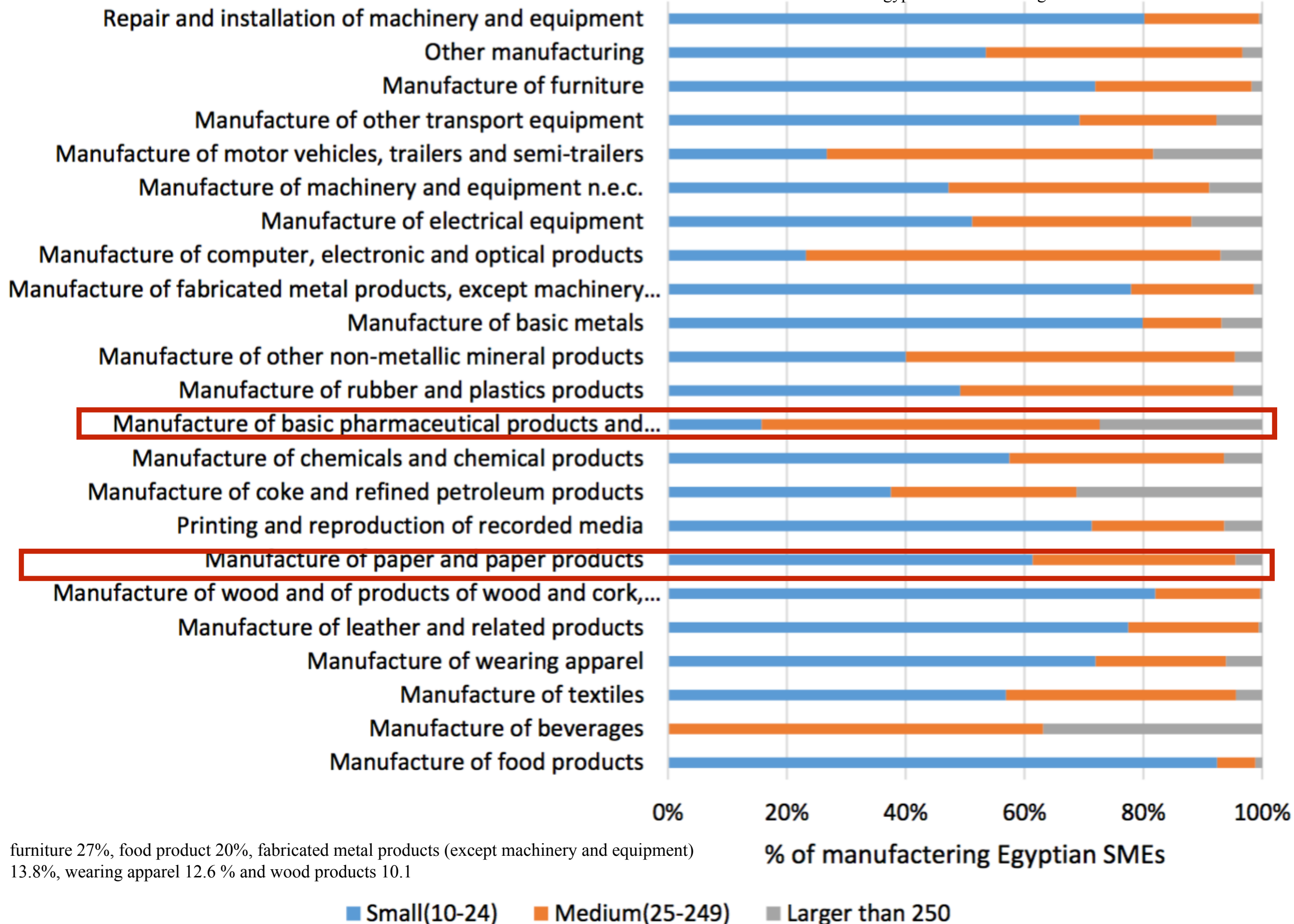
# CHALLENGES

- ❶ Lack of regional innovation strategies
- ❷ Legislative obstacles that face public Egyptian universities and research institutions in supporting their spin-offs and startup companies.
- ❸ Having a separate entity for managing science parks where the management of science parks could be in a business like manner
- ❹ Effectiveness of the supporting structure within the science park; # of incubation programs
- ❺ The availability of equity finance networks; especially in non-ICT sectors.
- ❻ Insufficient capacities of social and human capital
- ❼ The availability of the right and relevant physical facilities
- ❽ Involvement of non-tech organisations & facilities: technology brokering firms, universities' technology transfer offices, design, multimedia and arts, consultancy and patent attorneys' firms, etc

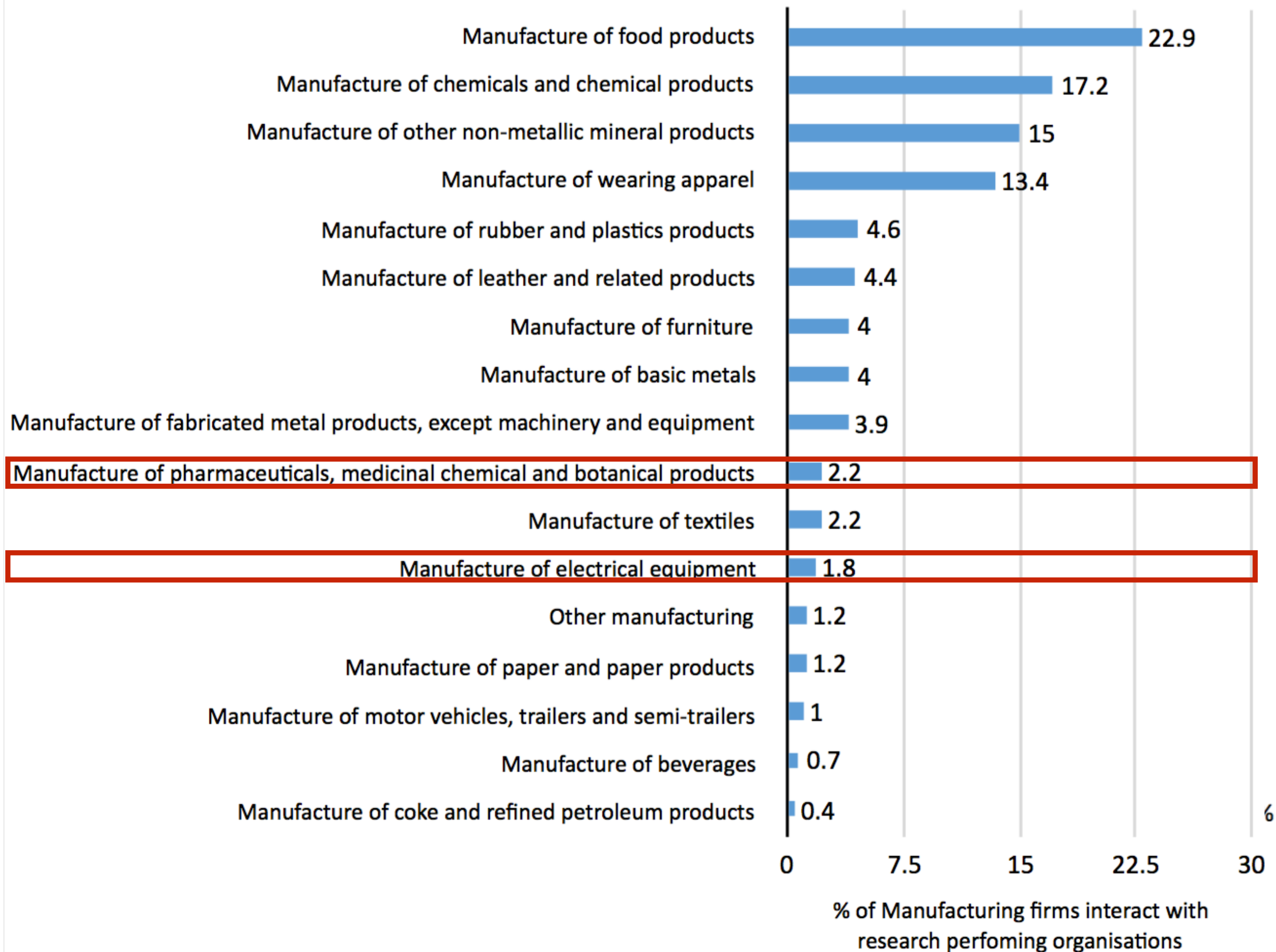


- TECHNOLOGY TRANSFER, RDI FPs, EGYPT COMPETITIVENESS NETWORK (in 2013 reactivated and connected to EEN, The Egyptian network has several strategic partners including the technology and industrial development sector of the Ministry of trade and industry, the Egyptian organisation for standardisation and quality, the EU department at the Egyptian commercial service, the Egyptian Junior Business association and the industrial Modernisation centre.
  - ▶ The evaluation and monitoring of these networks are missing. (quality of services)
  - ▶ The linkage of these networks to international networks is limited and insufficient.
  - ▶ Some of these networks are tend to be financially dependent networks (external sponsoring- Sustainability)
- More than 18 platforms are operating where some of them work by stimulating crowdfunding, others run competitions and fund the best innovative ideas with possibility of equity funding or work only in enhancing networking, matchmaking and provide set of targeted services. Only two of these platforms are managed by the government while others are owned by private companies or non-governmental organizations.
  - ▶ Innovation marketplace and crowdfunding platforms are mostly concerned with ICT, and social innovation (Agriculture focus).

The total number of Egyptian manufacturing firms is 385582



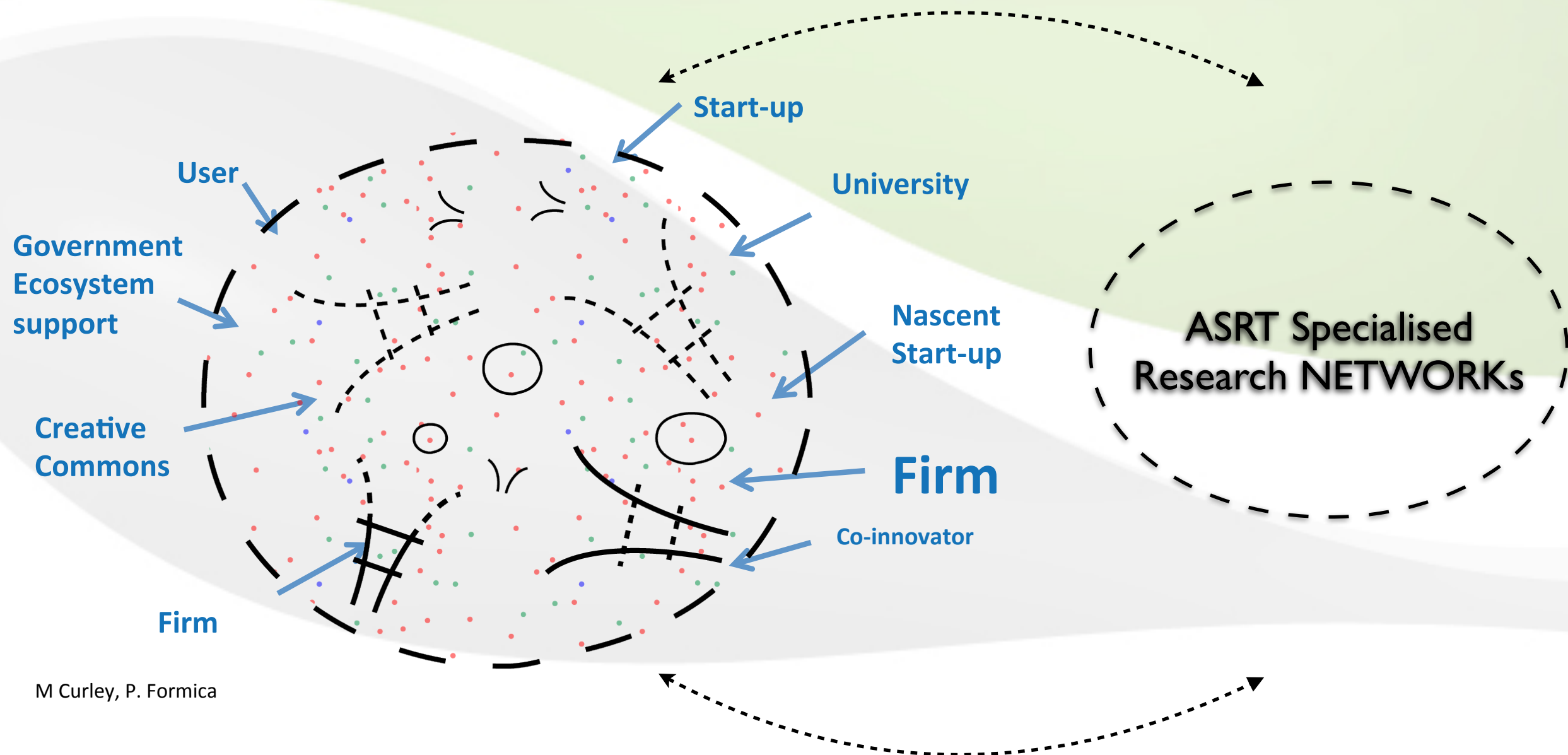




# INNOVATION CLUSTERS



# Specialised Research Networks (SRN) & Tech Alliances (KTA)



M Curley, P. Formica

long-lasting specialised Business-driven alliances.

Critical masses of scientific expertise

Unlike other similar networks and clusters, ASRT with its councils and relevant units contribute in the coordination of each cluster to ensure the optimum synergy.

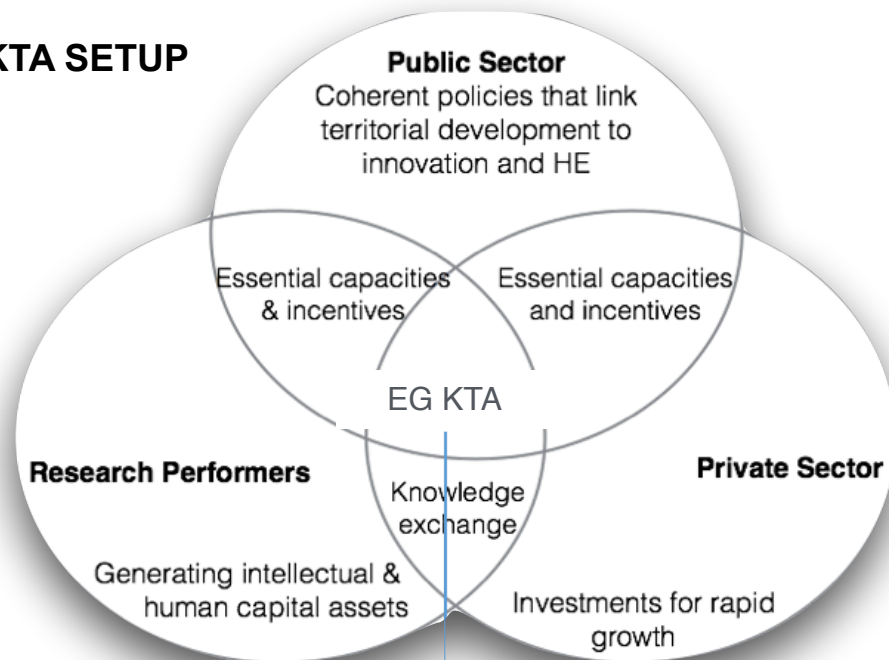
Beneficiaries: 10 partners involved include at least one participant from University, Research Institution, NGO, local authority and at least 3 participants from Industry.

**Industrial sector FOCUS:** Deepen local manufacturing in “Metallurgy”, “Petrochemicals”, “Pharmaceutics and vaccines”, “Renewable Energy”, “Textiles” & “Microelectronics”

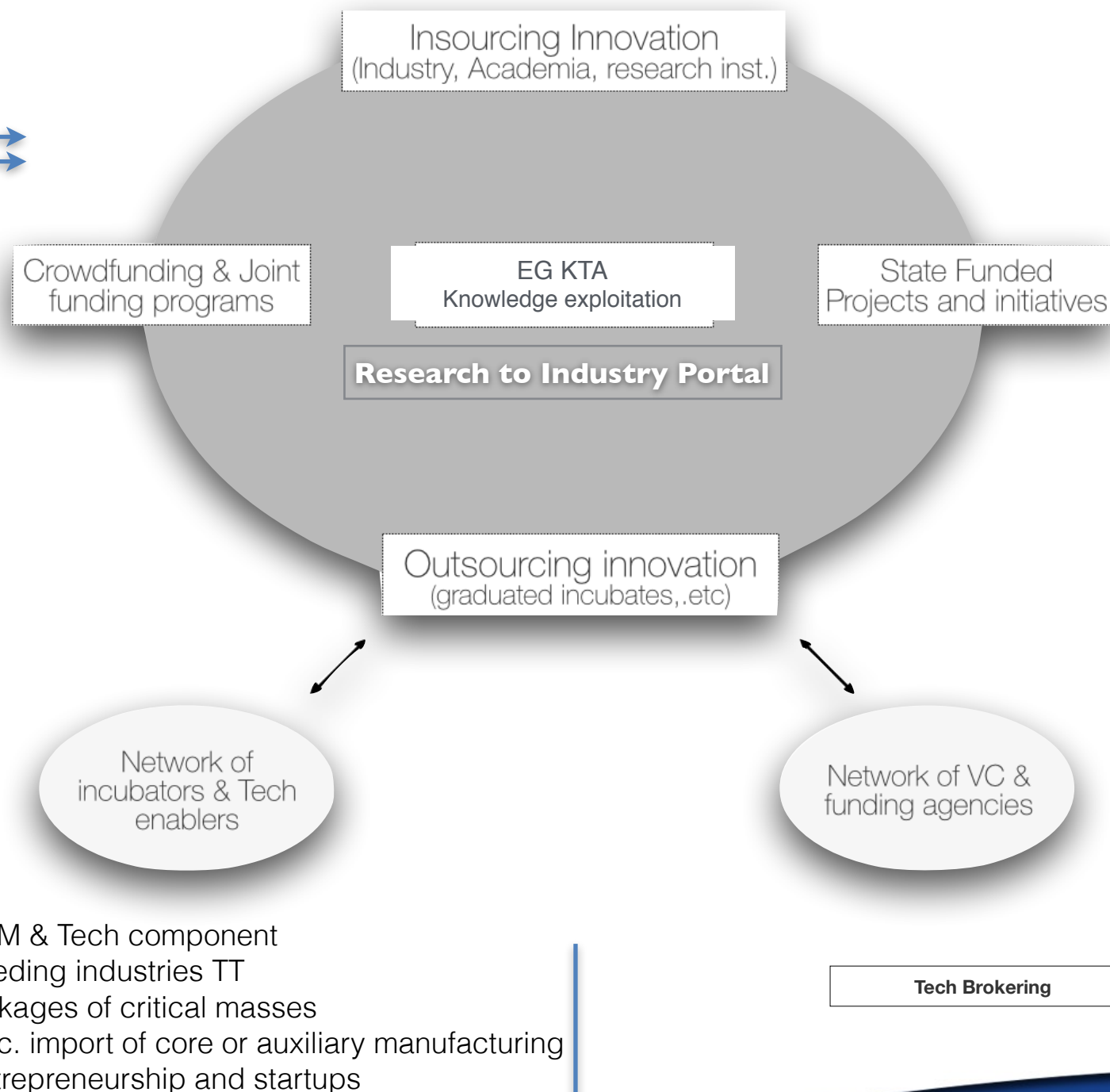
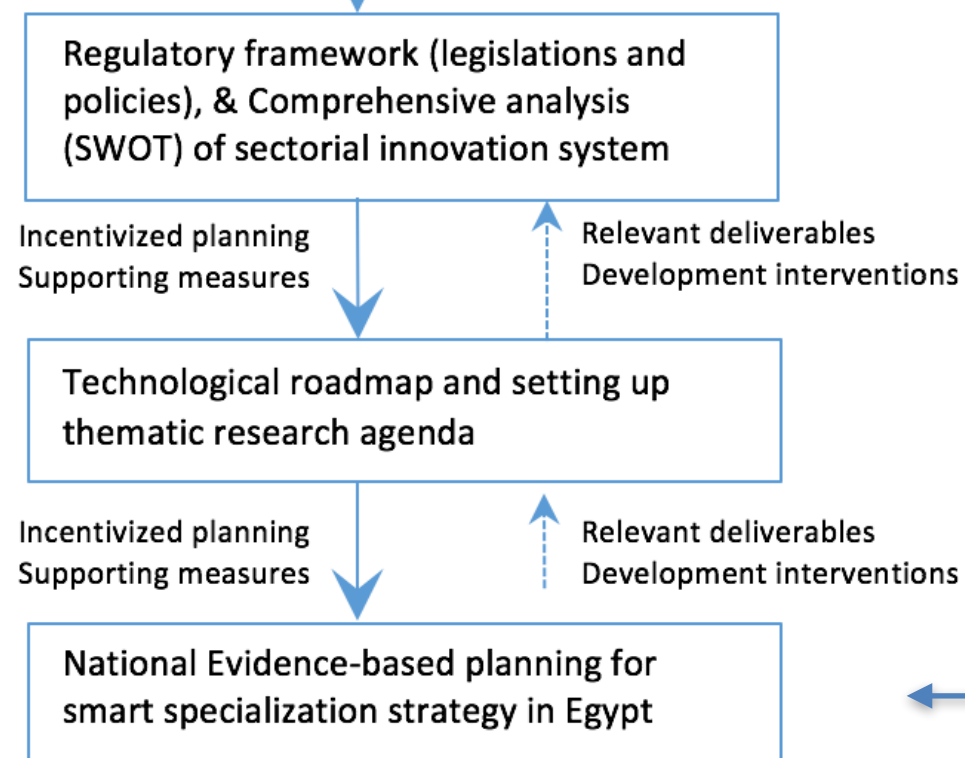
Specialised networks aims at pooling national resources and competencies together within a particular specialised topic. Universities and research institutions are the main target group. SRN can accommodate world class scientists to perform top notch research in collaboration with partner institutions

# Cross Sectional VIEW

## KTA SETUP

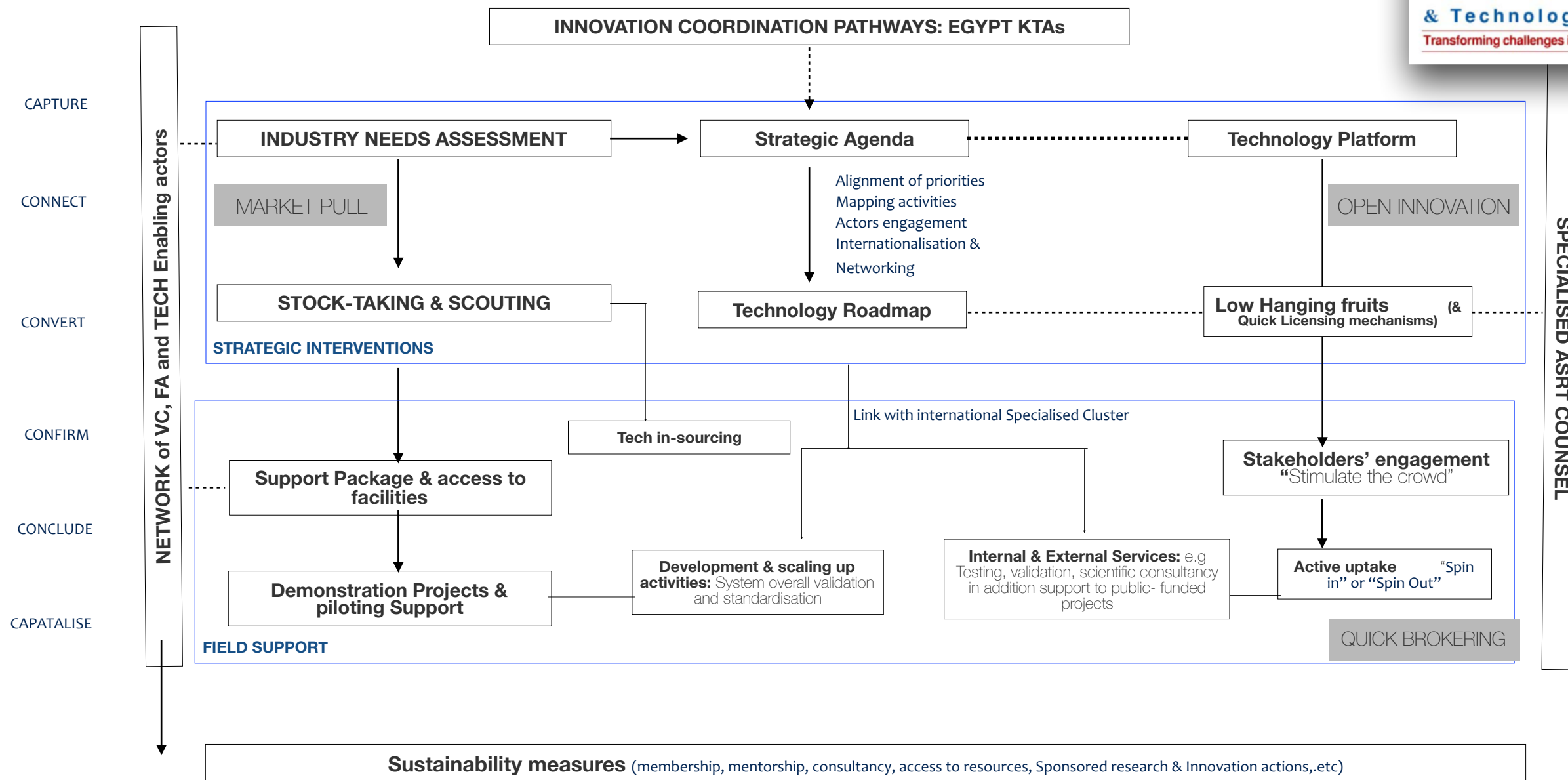


## Strategic approach

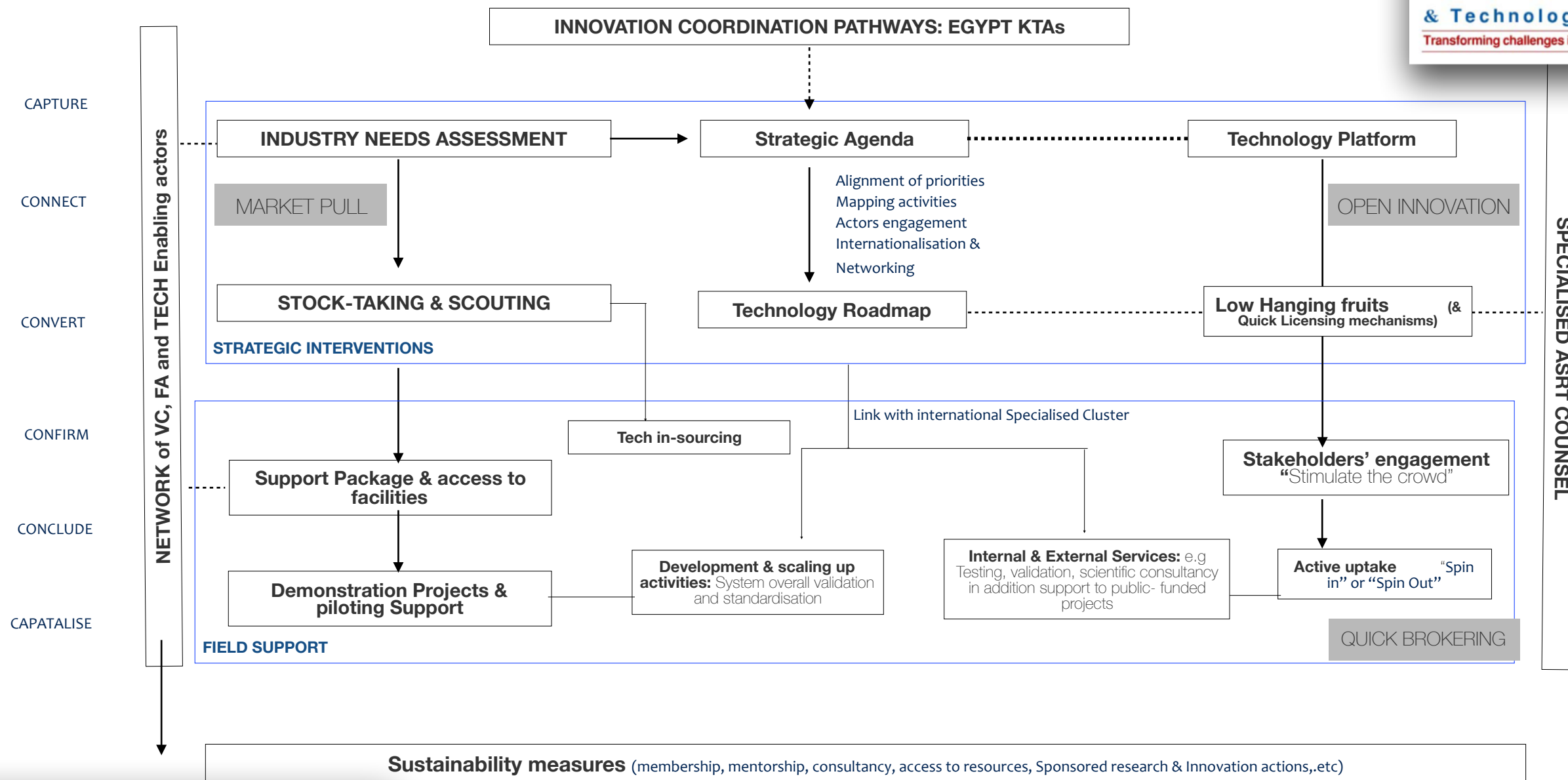




# Egypt KTAs Operational Overview : Transforming Challenges into growth opportunities



# Egypt KTAs Operational Overview : Transforming Challenges into growth opportunities

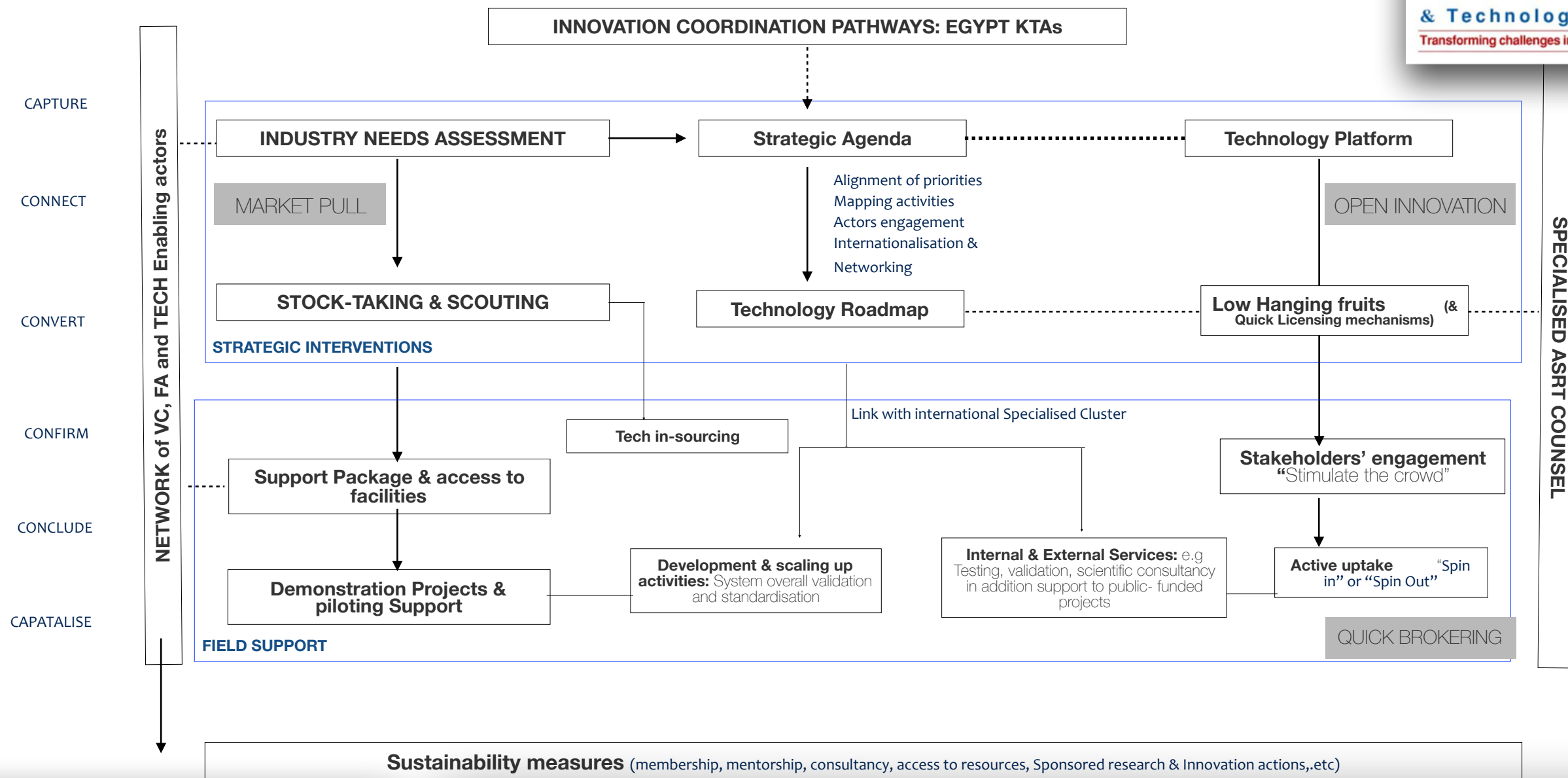


✓ All proposals must include the Technology development component; enhancing existing processes and products or developing new products and processes, in addition to one or more of the following:





# Egypt KTAs Operational Overview : Transforming Challenges into growth opportunities



All proposals must include the Technology development component; enhancing existing processes and products or developing new products and processes, in addition to one or more of the following:

- ☐ Conduct "Market uptake" initiatives and support the utilization of existing research results.
- ☐ Stock-taking of existing research results and scouting of new technological solutions.
- ☐ When needed, setting a thematic strategic and technical roadmap for industry development Empowering a group of SMEs and entrepreneurs to tackle technological challenges
- ☐ Conducting an up-to-date thematic- Industry needs' assessment
- ☐ Supporting the access to shared facilities and resources among partners
- ☐ Funding and integrative support of nascent start-ups



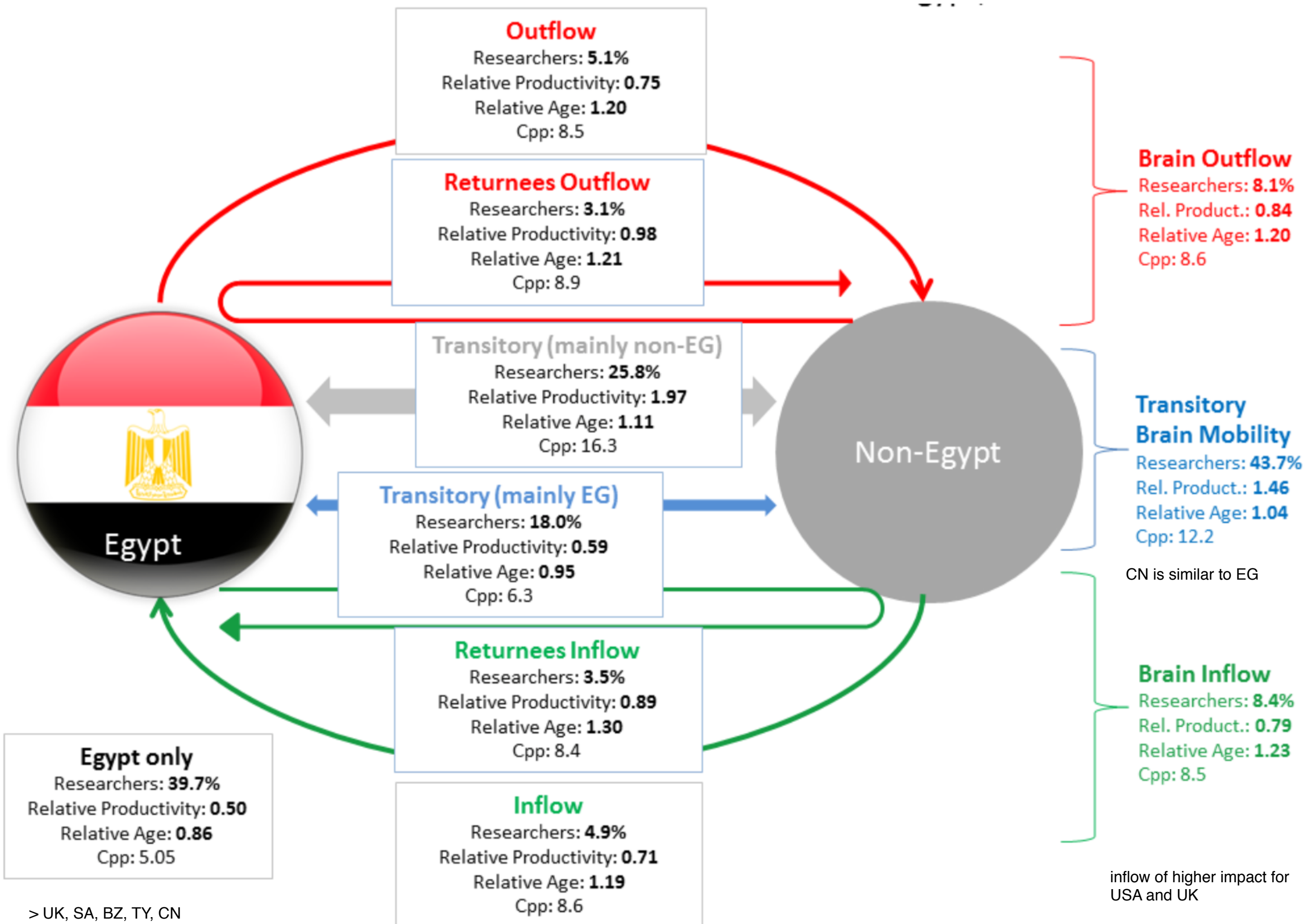
Scientific Productivity, Impact and International cooperation



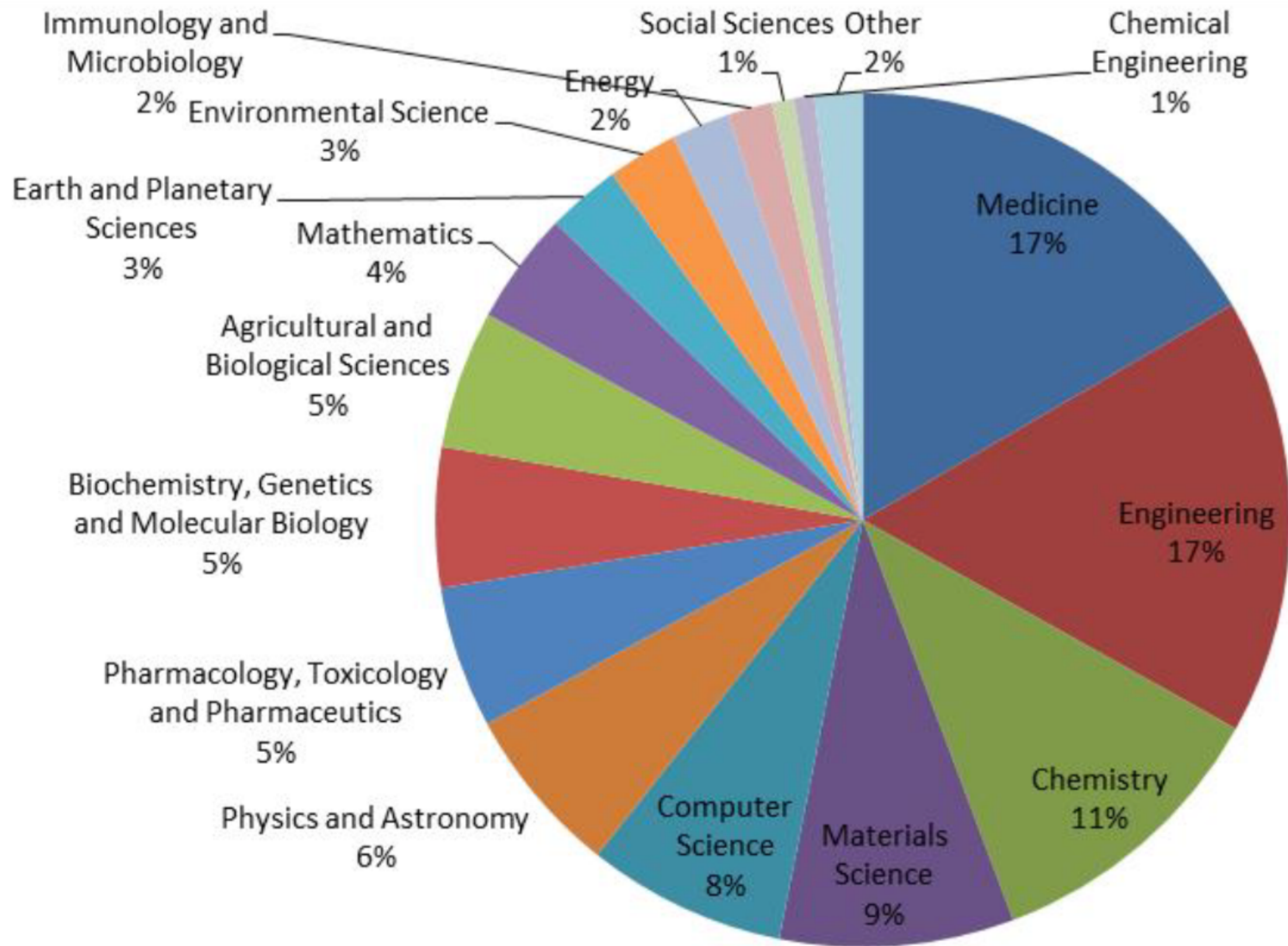








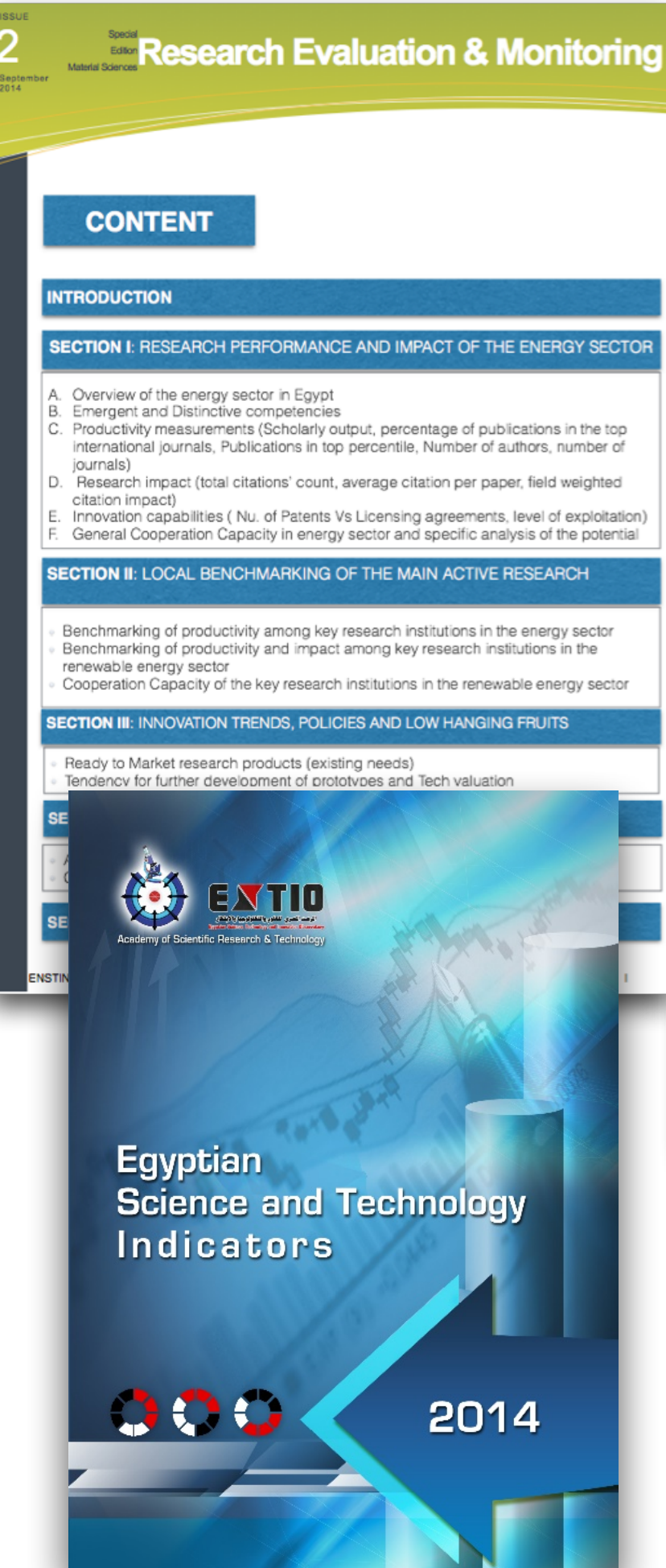
Net Migration Percentage is +ve for UK and USA



> UK, SA, BZ, TY, CN

Net Migration Percentage is +ve for UK and USA





Technological Roadmaps  
fitting in local societal  
challenges





## CONTENT

### INTRODUCTION

### SECTION I: RESEARCH PERFORMANCE AND IMPACT OF THE ENERGY SECTOR

- A. Overview of the energy sector in Egypt
- B. Emergent and Distinctive competencies
- C. Productivity measurements (Scholarly output, percentage of publications in the top international journals, Publications in top percentile, Number of authors, number of journals)
- D. Research impact (total citations' count, average citation per paper, field weighted citation impact)
- E. Innovation capabilities (Nu. of Patents Vs Licensing agreements, level of exploitation)
- F. General Cooperation Capacity in energy sector and specific analysis of the potential

### SECTION II: LOCAL BENCHMARKING OF THE MAIN ACTIVE RESEARCH

- Benchmarking of productivity among key research institutions in the energy sector
- Benchmarking of productivity and impact among key research institutions in the renewable energy sector
- Cooperation Capacity of the key research institutions in the renewable energy sector

### SECTION III: INNOVATION TRENDS, POLICIES AND LOW HANGING FRUITS

- Ready to Market research products (existing needs)
- Tendency for further development of prototypes and Tech valuation



## Egyptian Science and Technology Indicators

2014



Technological Roadmaps  
fitting in local societal  
challenges

## STI Evaluation & Monitoring

### Performance & Competencies' Visualizer

#### KEY SERVICES

- Research performance and impact  
Including cross sectional overview, Emergent and distinctive competencies, statistical measurements of productivity, statistical measurements of research impact
- Local & International benchmarking  
Including benchmarking of cooperation capacity, productivity and impact in addition to researcher's profiling
- Top Institutions and Top researchers  
Exploring of the top research institutions with highest productivity and impact, top journals and top researchers
- Local competencies & effective cooperation  
Exploring local competencies, visualising potential cooperation & market insights

#### Towards an effective planning and actions..

Innovation Insights, Research Impact & Management

This service is an important tool for policy makers, strategic committees and researchers. Egyptian S&T Network (ENSTINET) - at the Academy of Scientific Research & Technology- provides on an semi-annual base comprehensive reports about significant trends at the national research and innovation landscape, using the most recognised measurements and statistics of different research institutions' performance. These reports highlights the concrete qualitative & quantitative outputs of the research & innovation management fields

ENSTINET relies on its databases, cooperation capacities & agreements with the most recognised international publishers and business intelligence agencies that deal with research performance & Innovation analysis; using the state of the art analytical techniques. Moreover, Research & Administration offices at Egyptian Research institutions can -free of charge- request specific reports. These requests will be handled in maximum 10 working days.

[innov@sti.sci.eg](mailto:innov@sti.sci.eg)

## STI Evaluation and Monitoring

Special Edition 1  
National Research Centre  
Egypt

ring  
tion (2)  
n Egypt  
ring  
dition 1  
Centre

Produced by ENSTINET

ISSN: 2356-9999

**Thanks for your attention....**  
**Questions?**



[radwan.Amro@gmail.com](mailto:radwan.Amro@gmail.com)

ETC Consultant

101 Kasr Al-Ainy Street, 6th floor

Academy of Scientific Research & Technology