

# Green Innovation and Entrepreneurship

The slide features a decorative graphic at the bottom consisting of three horizontal bars. The top bar is dark blue, the middle bar is light blue, and the bottom bar is green. The bars are of varying lengths and are positioned on the right side of the slide, creating a modern, layered effect.

## Helmy Abouleish



- **Managing Director of the SEKEM initiative** that works for sustainable development in Egypt since 1977
- Under his stewardship, the SEKEM Initiative received the **“Right Livelihood Award 2003”**
- Member of the **Schwab Foundation for Outstanding Social Entrepreneurs** since 2004
- **Founder and co-founder of various organizations including:** The Egyptian National Competitiveness Council (ENCC), the International Association for Partnership (IAP), the Egyptian Biodynamic Association (EBDA), the Centre for Organic Agriculture in Egypt (COAE), SEKEM Development Foundation (SDF).
- Helmy Abouleish is a passionate advocate of **sustainable agriculture and sustainable development.**



## Rasha El-Kholy



- Prof. Dr. Rasha El-Kholy has 19 years experience working in the field of **water resources management and environmental protection**. She has **managed many foreign funded research projects** as well as national programs in the field of water Engineering.
- Rasha Elkholy is currently **the Dean of faculty of Engineering at Heliopolis University for Sustainable Development**. She has more than 10 years experience **developing specialized post graduate training programs and under graduate academic curricula** as well as supervising M.Sc. Students.
- She also serves as a **short term consultant for the United Nations - Food and Agriculture Organization (FAO)** and highly involved with international organizations.
- **Prof. El-Kholy has published several scientific research papers in international scientific journals in addition to some chapters in international books.** She is an active member in many international associations annealing scientific research to serve humanity's well-being and protect the environment.

## Maria Chiara Pastore



- Master Degree In Architecture
- PhD in Spatial Planning and Urban Development
- Post Doctoral Fellow in Urban Governance in Sub Saharan African Countries
- Adjunct Professor at Politecnico di Milano
- Project Manager of TEMPUS GIEP European Project

## Lorenzo Mattarolo



- He graduated in **mechanical engineering** at Università degli Studi di Padova
- He first focused his works on **energy efficiency in the built environment**, in an Italian consulting company and at the **Technical University of Denmark**.
- In 2008 he started working in the **R&D direction of an Italian energy utility**. He dealt with energy efficiency measures in the industrial and tertiary sectors.
- Since 2012 he has been working at **Politecnico di Milano as program manager for UNESCO Chair in Energy for Sustainable Development**, dealing with projects related to access to energy, sustainable development and international cooperation.
- Currently he is focusing his activity on **M&E models for energy cooperation projects**.



## Hani Sewilam



- Professor of Sustainable Development and Water Resources Management
- Director of the UNESCO Chair for Climate Change and Water Resources Management
- Academic Director of the Engineering Hydrology at the RWTH Aachen University in Germany
- Coordinator for the Capacity Building Initiative of the United Nations Water
- Researcher at the National Water Research Center in Egypt
- Advisor and Member of the Board of several Universities and International Organizations

# GDP Growth in Egypt

<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
3.5%	3.2%	3.2%	4.1%	4.5%	6.8%	7.1%	7.2%
<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>				
4.7%	5.1%	1.8%	1.5%				

*GDP is calculated as the value of the total final output of all goods and services produced in a single year within a country's boundaries.*

# Slums

*Over 16 million urban inhabitants live in informal and squatter settlements. (World Bank 2008)*





# Water Shortage

*There is acute water scarcity whereby per capita water share is expected to decline from a current level of 900m<sup>3</sup> to about 670m<sup>3</sup> in 2017.*



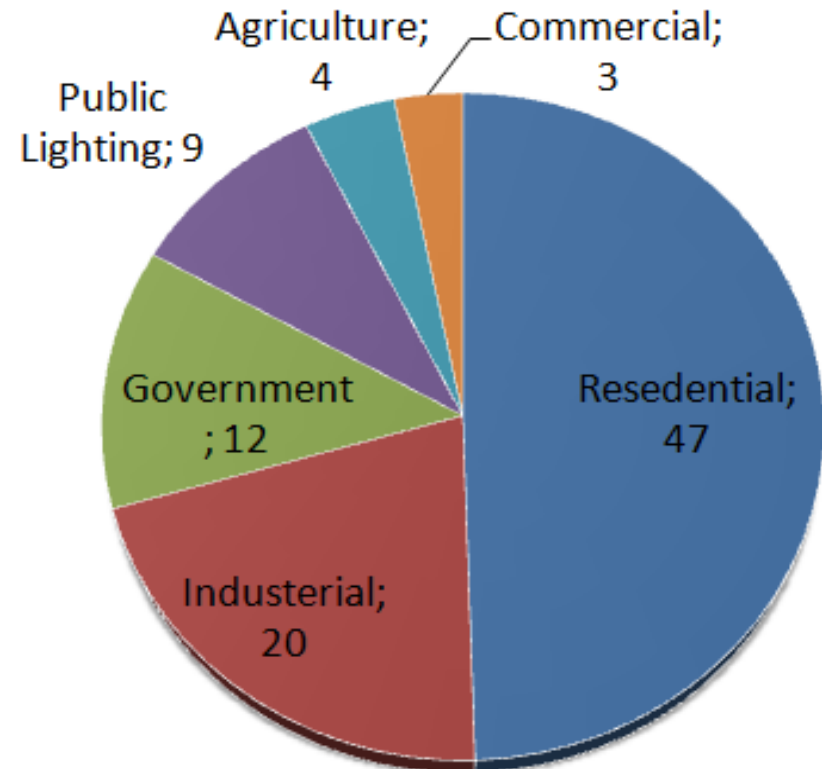
# Sewerage System

*the lack of connection to the sewerage system remains a serious threat with less than 5 per cent of households connected in rural areas.*



# Energy

*Egypt is facing a crucial energy problem. **Natural gas consumption nearly doubled over the last decades** and reached 1.6 trillion cubic feet in 2010. Total **petroleum consumption has risen by about one-third** over the same time period.*



# Education



# Agriculture

*Between 1976 and 1994, the country lost an average of 8000 ha of agricultural land yearly to urbanization into the desert.*



# Solid Waste

*An average of **15.3 million tons** of municipal solid waste is generated each year, out of which almost **2.5 million tons remain uncollected** and lack appropriate sanitary landfills for their final disposal.*



# Transportation

*the average speed on public roads will drop from actually (2008) **19 Km/h** to **11.6 Km/h** by 2022. In addition, **10,000 -25,000 yearly deaths** in Cairo due to air-pollution by the transport sector and contribution of transport sector to 28% of total energy use and 25% of all energy-based CO2 emissions highlights the transport challenge in Egypt.*



# Unemployment

The unemployment rate in Egypt was last reported at 12.6 percent in the second quarter of 2012





# Air Pollution

The analysis of the future trends in GHG emissions in Egypt indicate that they may triple by 2017, compared to 1990 levels.



# Poverty

54% of the total of Egypt's rural poor and about 42% of the total poor population at the level of the Republic.





# Green Innovation and Entrepreneurship- Towards a Sustainable Future of Egypt

**Biovision Alexandria Conference 2014**

Tuesday, 8<sup>th</sup> April, 2014

*Helmy Abouleish*

*CEO- SEKEM Group*

## SEKEM – A Model for Sustainable Development/ Entrepreneurship

### Goals:

- ❑ **Biodynamic Agriculture:** The development of biodynamic agricultural methods suitable for Egypt's climate, and agricultural conditions.
- ❑ The development of a local organic market.
- ❑ **FairTrade:** All products should be produced in a social manner based on cooperation, association and brotherhood.
- ❑ **Corporate Social Responsibility.**
- ❑ **Human Development:** All employees should have continuous access to development, education and training to achieve self-realization.
- ❑ Investment in R&D and innovation.
- ❑ Spreading the Sekem idea all over Egypt.



## Transforming the Desert – 36 Years of SEKEM

The first SEKEM building in 1979



The same building in 2009



A SEKEM field in 1987



The same field in 2009



## Sustainable Value Creation



- 36 years sustainable agriculture at SEKEM
  - 20,000 feddan (including suppliers)
  - 2,000 jobs
  - 400 small-holder farmers
  - Over 1 million tons CO<sub>2</sub>e sequestered
  - 20-40% water savings
  - Continuous yield increase
  - Continuous decrease of inputs

## Green Innovation in Egypt: Compost





## Green innovation in Egypt: Irrigation technologies

### Improved Irrigation Efficiency through Subsurface and Hydrop Irrigation



**Green Innovation in Egypt:** Treatment with Effective Microorganisms for re-usage for timber production and for gardens



## SEKEM – a Learning, Living Community

- About 2,000 employees in SEKEM Group and Foundation
- Safe workplaces, respect for the dignity of every employee
- Women empowerment and religious tolerance



United Nations Development Fund for Women



Working for Women's  
Empowerment and  
Gender Equality



Tempus



## SEKEM – Developing Human Potential

- Kindergarten and school
- Medical centre
- Vocational training
- Community school
- Children with special needs
- Adult education
- Heliopolis Academy for research and training
- Heliopolis University for Sustainable Development



## Why a MSc like Green Innovation and Entrepreneurship Programme?

- Egypt lacks social innovators and entrepreneurs
- The current generation of Egyptian university graduates is not equipped to deal with problems at hand
  - Link between Universities and Business
- **GIEP** seeks to produce a **new generation of social entrepreneurs** who can positively contribute to the sustainable development of Egypt

Thank you very much for  
your attention!

[www.sekem.com](http://www.sekem.com)

Helmy Abouleish

SEKEM Group

P.O. Box 2834 El Horreya

Cairo, Egypt

[helmy.abouleish@sekem.com](mailto:helmy.abouleish@sekem.com)

## Green Innovation and Entrepreneurship Programme – Towards a sustainable Future

**Biovision Alexandria Conference 2014**

Tuesday, 8<sup>th</sup> April, 2014

*Rasha Elkholy*

*Dean, Faculty of Engineering – Heliopolis University*

*Khaled El-Saadany*

*Executive Manager, Grants, Innovation & Technology*

*Transfer Center- Alexandria University*



Tempus



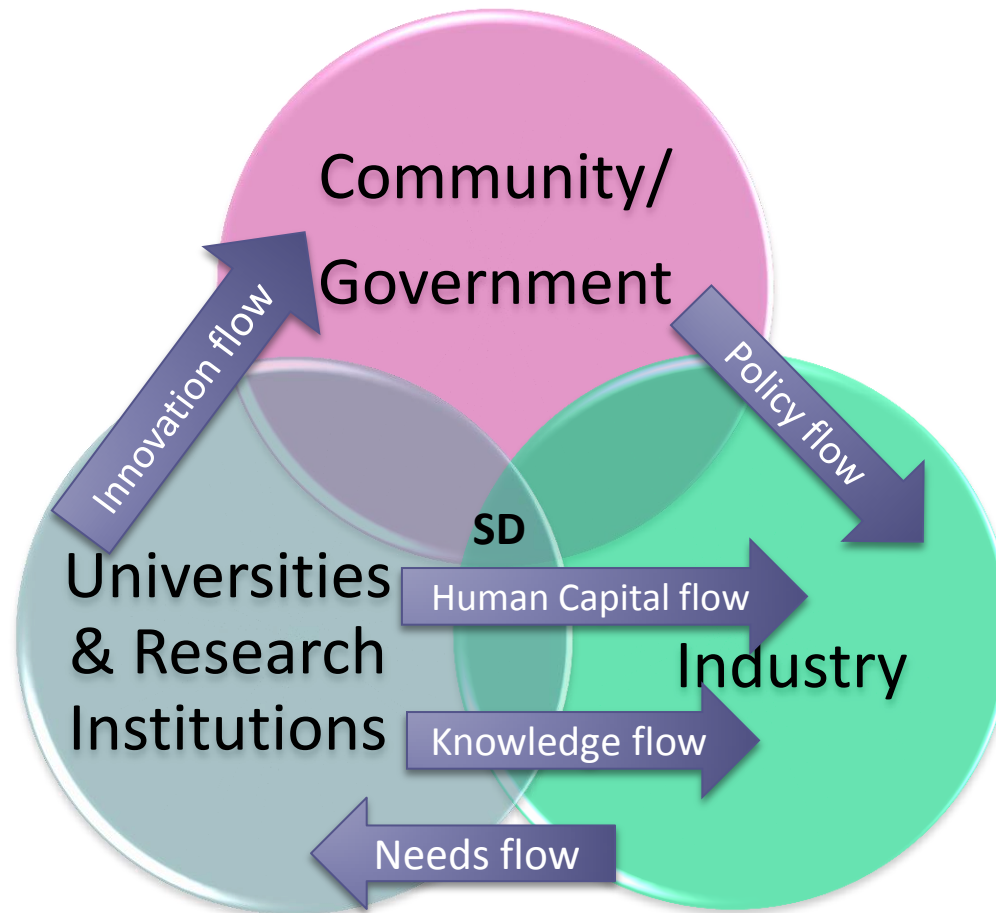
GIEP

# University & Industry!! Why to link?

- Universities must shift from teaching-based entities to research-based universities to play a more active role in Knowledge-based businesses and economy in Egypt.
- Universities should implement up-to-date knowledge, develop new technologies and bring innovative ideas to the table.
- Universities must listen to the needs of corporates in a long-term process to drive projects, research, training programs, product development, job creation and overall economic impact.
- Universities need to understand the university-industry alliances and academic entrepreneurship to create a culture of enterprise and open innovation.



# Triple Helix Model



# GEIP – Market Needs Analysis

Institution	Alexandria University	AUC	Zagazig University	Aswan University	HU
Students	29	29	30	19	29
Companies/Organizations	10	1	10	0	6 + 4

Assessing:

- A. Challenges
- B. Skills and needs
- C. **Communication & collaboration**

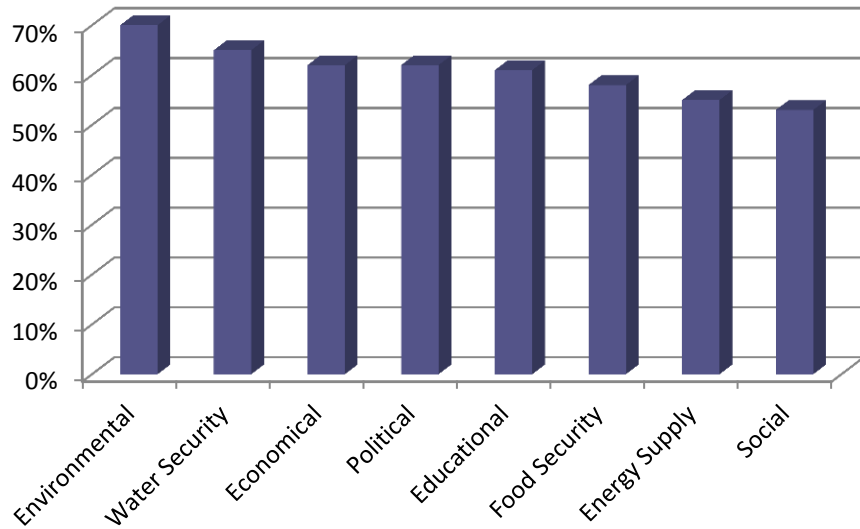


Tempus

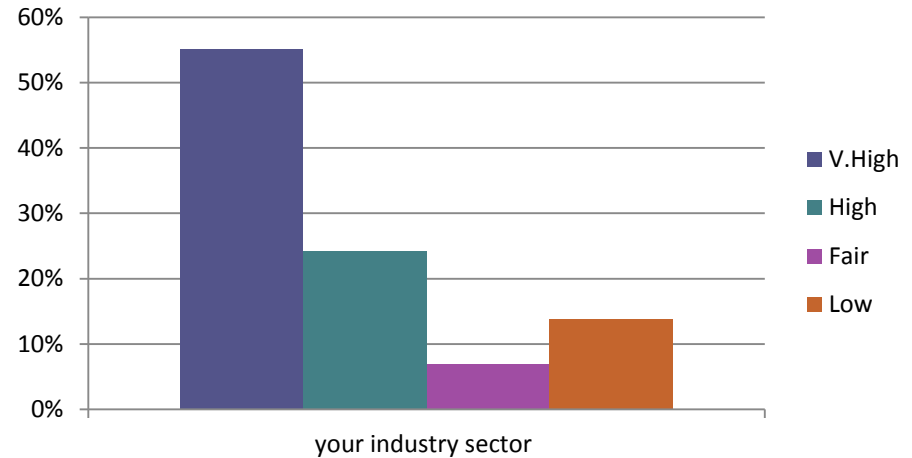


GEIP

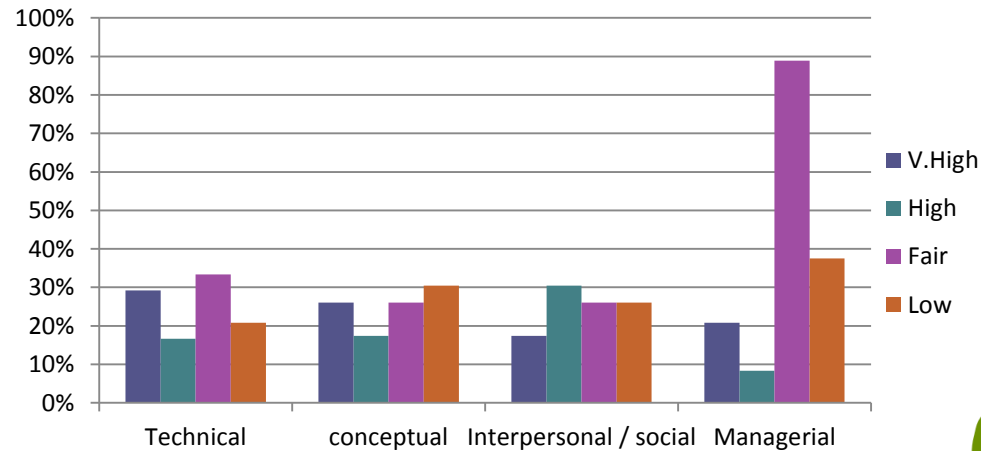
# GEIP – Market Needs Assessment



Challenges



Link to industry sector and collaboration



Graduates' skills for innovation



# To graduate the right people for the real needs

- Universities should graduate people with the following skills: entrepreneurial skills, capability to start-up business, problem-solving skills, etc.
- Higher Education Institutions have to move to Entrepreneurial University concept
- Recognize the community & industry needs
- Integrate the Innovation and Entrepreneurship in Education system.

# Approach

- The new Master program “ Green Innovation & Entrepreneurship will be started next Sept. 2014 as joint degree with 4 sub-tracks:
  - Green Technologies
  - Sustainable Cities
  - Green Innovation management & Entrepreneurship
  - Sustainable Communities
- Establishment of Career Development Centre (CDC) to develop and build the students & graduates skills

# Green Energy for Green Companies

- To contribute to the pollution emissions decreasing by adopting the renewable energy as main power source, particularly at the farm level.
- Spreading the RES plants use and ensuring the energy self-sufficiency at farms level & strengthening SMEs innovation capacities.
- Mapping of local farms and standardization of crop production defined
- RE systems implemented; define the size of the farm , and the technology among those most commonly used in the field of agro-industry:
  - Solar photovoltaic plants integrated on structures and existing buildings
  - Tri-cogeneration plants biomass
  - Small wind turbine plants

- **RES training workshops:** Promoting knowledge and awareness about green energy and energy saving, opportunities of RES implementation, the most advanced technology available in the market.
- **“Green Energy Promoter” training courses :** to spread the know-how in the field of green energy helping companies to choose a green agricultural system and leading them in the path to RES implementation offering its technical and administrative support.
- Develop a **data collecting system** of local SMEs include administrative (company type, turnover, internal staff,..), territorial (RES availability, developing energy supply opportunities according to local SMEs peculiarities) and energy data (energy needs, technologies adopted, energy resources used, land availability for plants implementation), plus quantified data about waste production and an overview to the long term SMEs development opportunities.

- Identifying, exchanging, testing and sharing feasible waste management models in old towns
- Develop policy guidelines for the waste management

## Expected result

- Improved waste management policies & strategies through the integration of practices, tools and policies
- Improve attitude of population towards the waste management from the environmental, social perspectives
- Reinforced overall environmental protection at Med. Countries by engaging many old towns in the use of feasible pattern for waste collection



The aim of the **WWTR** project is to introduce unconventional water resource from a locally assembled treatment unit treating from 15 m<sup>3</sup>/day of water to reach 90 m<sup>3</sup>/day.

The effluent is reused for irrigating unproductive trees and extending the greenery around the campus (4 feddans) without negatively impacting the ground water by infiltration.



The aim of the **Photovoltaic** project is to stimulate the photovoltaic market in Egypt by using demand-oriented systems and anchor application-oriented knowledge about the solar technology in the education sector and in the private sector of the country sustainably.

**Deutsche Entwicklungsgesellschaft (DEG)**



- Installation of 5 kWp demo plant with different types of modules and integration of local materials for mounting structure
- Establishment of PV lab at Heliopolis University
- Integration of PV practicalities into existing curricula of HU
- Development of business model for Egyptian PV market





- Project proved improvement in the physical-chemical properties of soil.
- Total water saving and reduction of weeds leading to high profit.

Agro Photo Voltaic-system combined with  
Reversed Osmosis-water pumping and  
purification technology based on a hybrid  
system

Solar water pumping for irrigation purposes  
in the small marginalized villages

POLITECNICO DI MILANO



POLITECNICO DI MILANO



Politecnico di Milano is a Public State University founded in 1863 thanks to a strong cooperation with the local industrial setting in Milano .

Engineering (since 1863)

**19% of engineers, 22787 students**

Architecture (since 1865)

**29% of architects, 9692 students**

Industrial Design (since 2000)

**78% of designers, 4159 students**

## New directions

The global context becomes increasingly **multi-disciplinary** and **multi-ethnic**. Social challenges are increasingly complex. Specific knowledge and skills are needed and a systemic vision is now mandatory. Attention and relevance need to be given to:

1. Innovating teaching activities and learning outcomes
2. Scientific research for development and innovation
3. Partnerships for capacity building and joint project (north-north, north-south)
4. Responsibility and ethics

### Innovation

- a key driver for **enabling growth potentially** resulting in **development**
- the creative attitude towards **new business models** able to fit different frameworks and policies

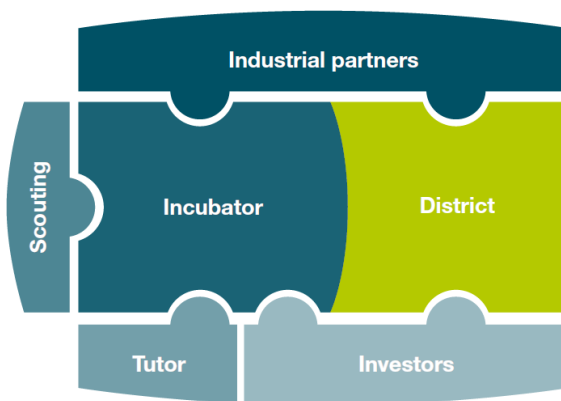


## PoliHub – Startup District & Incubator

PoliHub is the **startup district and incubator** run by Politecnico di Milano.

It is an ideal place for getting the most out of **ideas and turn them into a genuine company**. The opportunities are vast, encompassing hi-tech, design, gaming, social networks, mechanics and computer security, medical device and energy.

It is for **developers, makers, designers, managers and experts** in sectors characterized by **technological innovation** (electronics, mechanics, energy, medical device, robotics, telecommunication). It is aimed at **entrepreneurs seeking to grow their business** in a district, through new ideas and products and services in the process of being developed.



### PoliHub provides:

- Network
- Empowerment programme
- Services  
(administrative, legal, communication and press office, ICT consulting, assistance in finding funding)
- Venture capital
- Advisors

## Polihub – Startup District & Incubator



Fondato nel **2000**  
Founded in

Più di **500** idee analizzate nel 2013  
ideas analysed in 2013

Più di **100** startup altamente innovative incubate dal 2000 ad oggi  
highly innovative startups incubated since 2000

**32** anni: età media dei nostri imprenditori  
average age of our entrepreneurs

**9°** fra i migliori incubatori d'Europa  
best incubator in Europe\*

Over **5000** idee raccolte  
ideas collected

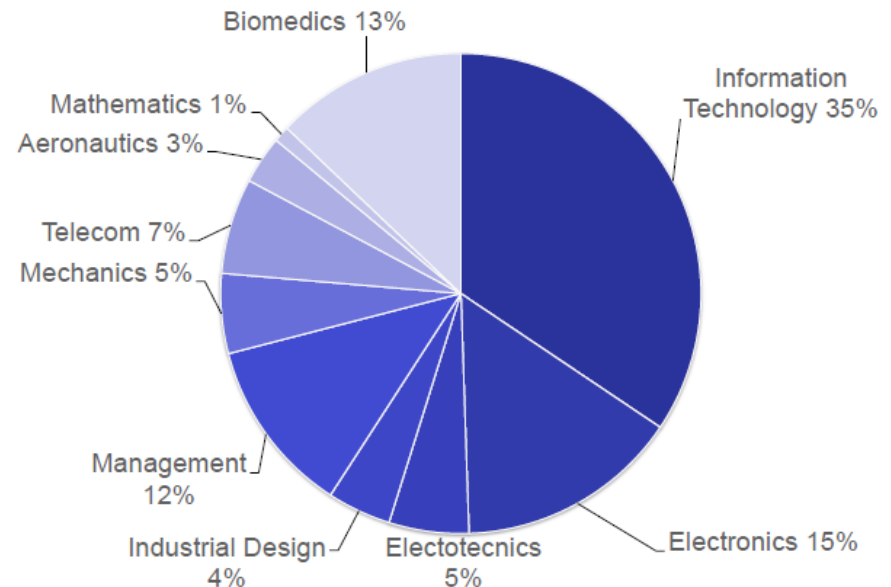
**83%** delle startup attive sul mercato a 12 anni dalla costituzione  
of the startups are still operating 12 years on

**5** grandi acquisizioni nazionali e internazionali  
major international and national acquisitions

Oltre **300** idee supportate nello start-up  
ideas supported in the startup phase

**50** aziende incubate nel 2014\*\*  
companies incubated in 2014\*\*

### Target Markets





## Polihub – Some success stories



### **TRE: Tele-Rilevamento Europa ([www.treuropa.com](http://www.treuropa.com))**

Founded in 2000 as the first Spin-Off of Politecnico di Milano

Market: satellite radar analysis for land subsidence

Two headquarters in Italy and Canada with leading a global market.

### **NEPTUNY ([www.moviri.com](http://www.moviri.com))**

Founded in 2001 in the AI, opened the Inc. in Bay Area some years later.

Market: hardware and software optimization in data-center.

Trade-sale operation in 2010 by BMC Software in US.

MOVIRI is the Consulting Company supporting Neptuny technology acquired by BMC.

### **FLUIDMESH ([www.fluidmesh.com](http://www.fluidmesh.com))**

Founded in 2005 with two head quarter: one in Milan and one in Boston.

Market: wireless mesh network for critical applications in security and industrial systems

M&A operation in 2011 by Generation3 Capital e Waveland Investments. Now part of Avrio

RMS Group, a new Carrick Bend Group Company in Chicago.

## Polihub – Some success stories

### **RESTECH ([www.restech.com](http://www.restech.com))**

Professional and domestic diagnostic system for the full evaluation of the respiratory function.  
Markets: hospital, clinics, professional and domestic.

### **XG LAB([www.xglab.it](http://www.xglab.it))**

High-performance electronics and instrumentation for X-ray and Gamma-ray applications.  
Markets: all vertical markets adopting X- and Gamma-ray diagnostics.

### **EMPATICA ([www.empatica.com](http://www.empatica.com))**

Wearable sensors tracking personal emotions and health parameters  
Market: personal medicine, consumer-electronics and video-games

### **PLOONGE ([www.ploonge.com](http://www.ploonge.com))**

Social Ticketing Network  
Small-Medium Size Events

### **JUSP ([www.jusp.com](http://www.jusp.com))**

Mobile POS  
Market: mobile payments

### **JOB YOUR LIFE ([www.jobyourlife.com](http://www.jobyourlife.com))**

Personalized job-seeking web-system  
Market: job-hunting and HR

### **GINKGO ([www.ginkgoumbrella.com](http://www.ginkgoumbrella.com))**

Ultra resistant and 100% recyclable umbrellas fully personalized.  
Market: Consumer products, both B2B and B2C

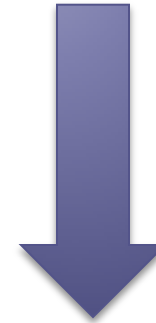


## Cooperation between departments and private sector



### Research activity

Oriented towards innovative solution, by improving methodologies and assessing most appropriate technologies for specific contexts



### Advisory

To improve the effectiveness and sustainability of projects



## Innovation in education for Sustainable Development

➔ New competences and new attitude to social responsibility and global concerns

### The Alta Scuola Politecnica (ASP)

The mission of ASP is to provide high-profile graduates combining in-depth (vertical) disciplinary knowledge from their MSc program with interdisciplinary (horizontal) skills that are needed to work and contribute leadership in a truly multidisciplinary environment and to pursue complex innovation projects.



### Energy for Development - new track in MSc in Energy Engineering

The track has the goal to prepare a professional figure with a broad knowledge in technical and scientific fields, including the development of technologies and the energy analyses of different scenarios in different areas, aiming at promoting local sustainability and socio-economic growth. Students acquire and enforce skills, competence and knowledge, in line with the globalization and the complex interrelations that the challenge for sustainability requires

# Green Innovation and Entrepreneurship Programme



GIEP



Tempus

**Tempus programme** is a **European Union** programme which supports the **modernization of higher education** in the Partner Countries of Eastern Europe, Central Asia, the Western Balkans and the Mediterranean region, through university cooperation projects.

## Egyptian Partners

Ministry of Higher Education  
The American University in Cairo  
Alexandria University  
Aswan University  
Heliopolis University  
Zagazig University  
Sekem Development Foundation  
Soil and More - Egypt

## European Partners

RTWH  
TUGraz  
Fondazione Politecnico di Milano  
Politecnico di Milano

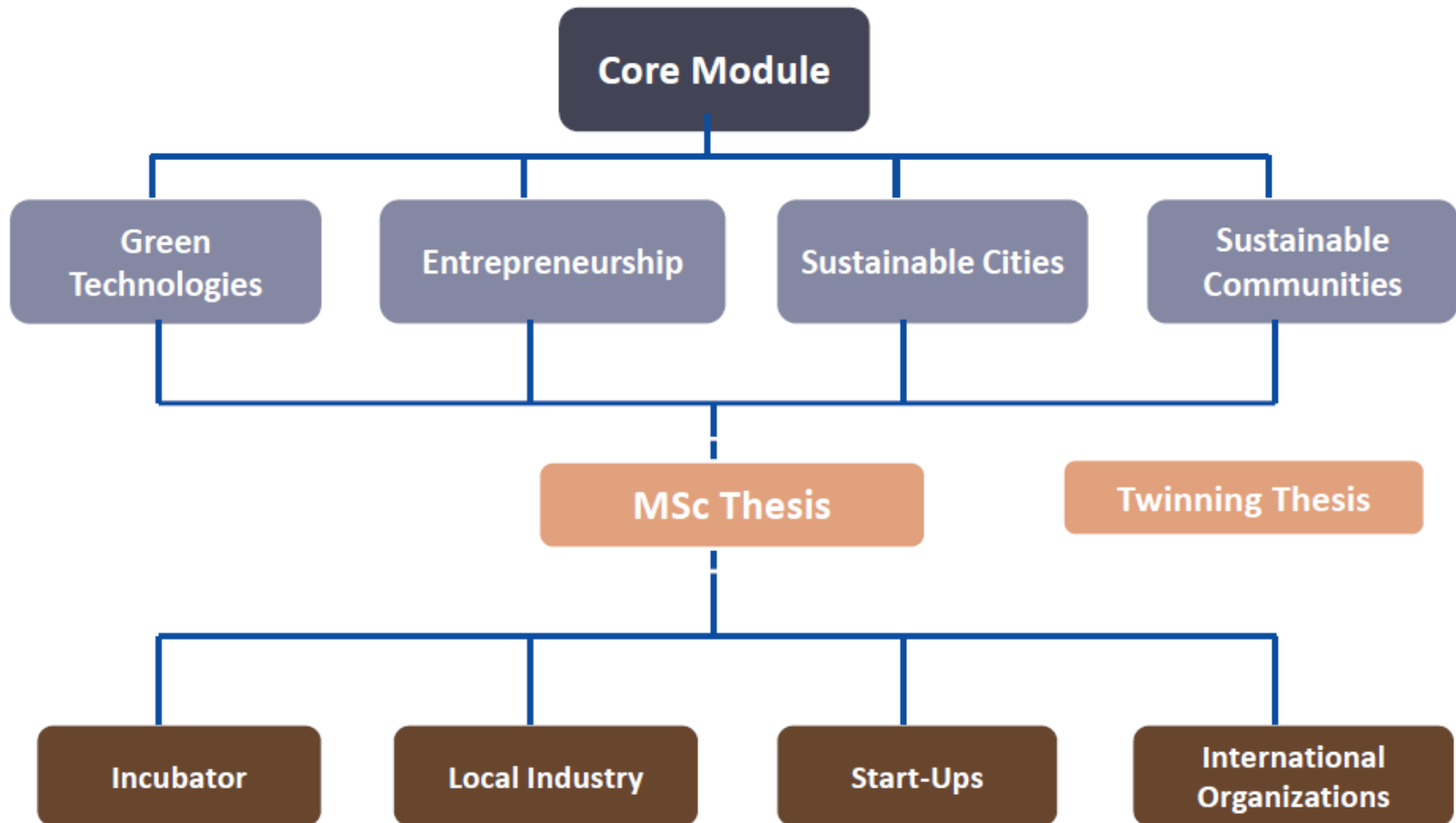


## General Objective

to make **Sustainable Development and Green Economy** the new entrepreneurial frontier and hot business in Egypt. The project aims to develop a **double MSc program on “Green Innovation and Entrepreneurship - GIEP”** in order to create a whole new generation of business and social entrepreneurs.

## Specific objective

1. Developing a joint/double **MSc program GIEP**.
2. Introducing **green technologies** and labs.
3. Developing the **capacities** of the EG academic members.
4. Developing a **Web-based online Learning Management System**.
5. Pilot **implementation of GIEP** and EG&EU **accreditation**.





[www.giep.eu](http://www.giep.eu)