



Science & Technology Parks & Technology Incubators: Tools for supporting Entrepreneurship and Regional Development



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OUTLINE OF THE PRESENTATION

- ▶ ***Science & Technology Parks: definition and role in regional development***
- ▶ ***Technology Business Incubators***
- ▶ ***Science & technology Parks in Greece: Evolution and current situation***
- ▶ ***Science & Technology Park of Crete: Its role in promoting entrepreneurship***



DEFINITION OF SCIENCE PARK (IASP)

“A Science Park is an organization managed by specialized professionals whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge – based institutions”

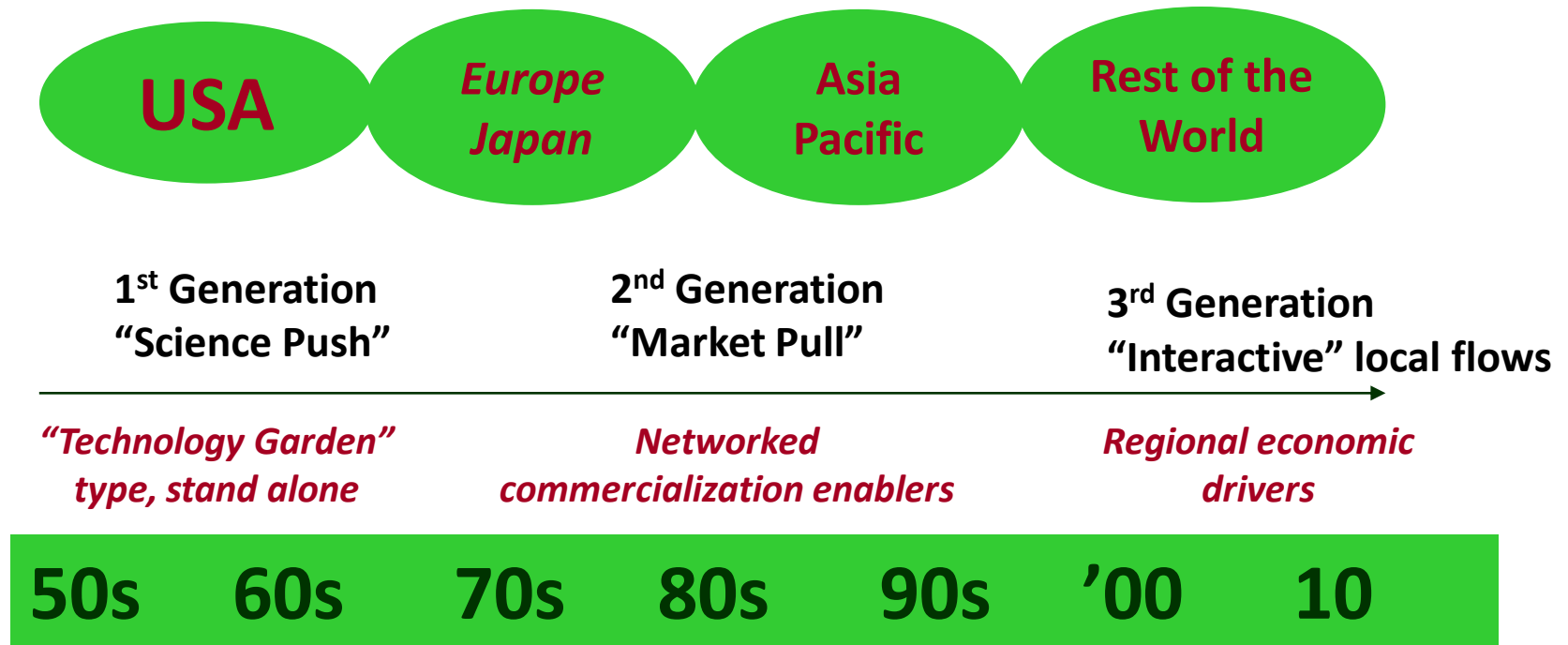
www.iasp.ws

Names: Science & technology Parks, Science Parks, Technology Parks, Technopoles, ...



EVOLUTION OF SCIENCE PARKS

Appeared spontaneously in the US in the 50s and 60s. S+T play an ever more central role in economic & social development, creation of high added value networks, contributed to international competitive advantage



World STPs Population: >1000



WHAT SCIENCE & TECHNOLOGY PARKS DO

- ▶ ***Occupy a unique role in economic development***
- ▶ ***Emphasis in the following factors:***
 - ***Technology transfer***
 - ***Incubation for start-up companies***
 - ***Support for business in the grow-up stage***
 - ***Create a suitable environment for larger & international business***
 - ***Create formal and operational links with centres or research and knowledge***
 - ***Support regional development***

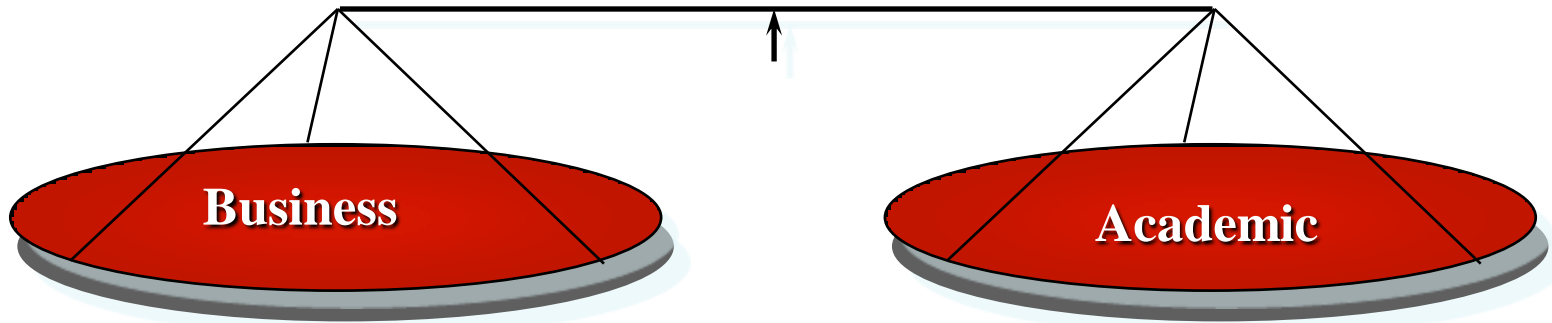


COMMON GOALS OF STPs

- ***Promote research - business linkages and Technology Transfer***
- ***Encourage spin-off firms started by academics***
- ***Create new jobs, directly and indirectly***
- ***Attract new sources of technology enterprise financing into the region***
- ***Create synergies between firms by clustering on site***
- ***Improve the performance of the local economy***
- ***Improve the image of the location***
- ***Enhance the competitiveness of new as well as existing firms in the region***
- ***Promote an innovation culture in the region***



THE BALANCED ENVIRONMENT OF A STP



A. Activities

Information: Media/Info-days/Workshops/Exhibitions

Tech. Transfer: Training/Placement/Auditing/Brokerage/
Licensing (in-out) /IPR/Prototyping

Financial: Seed Capital / Venture Capital /
Co - management / Incubators

B. Personnel

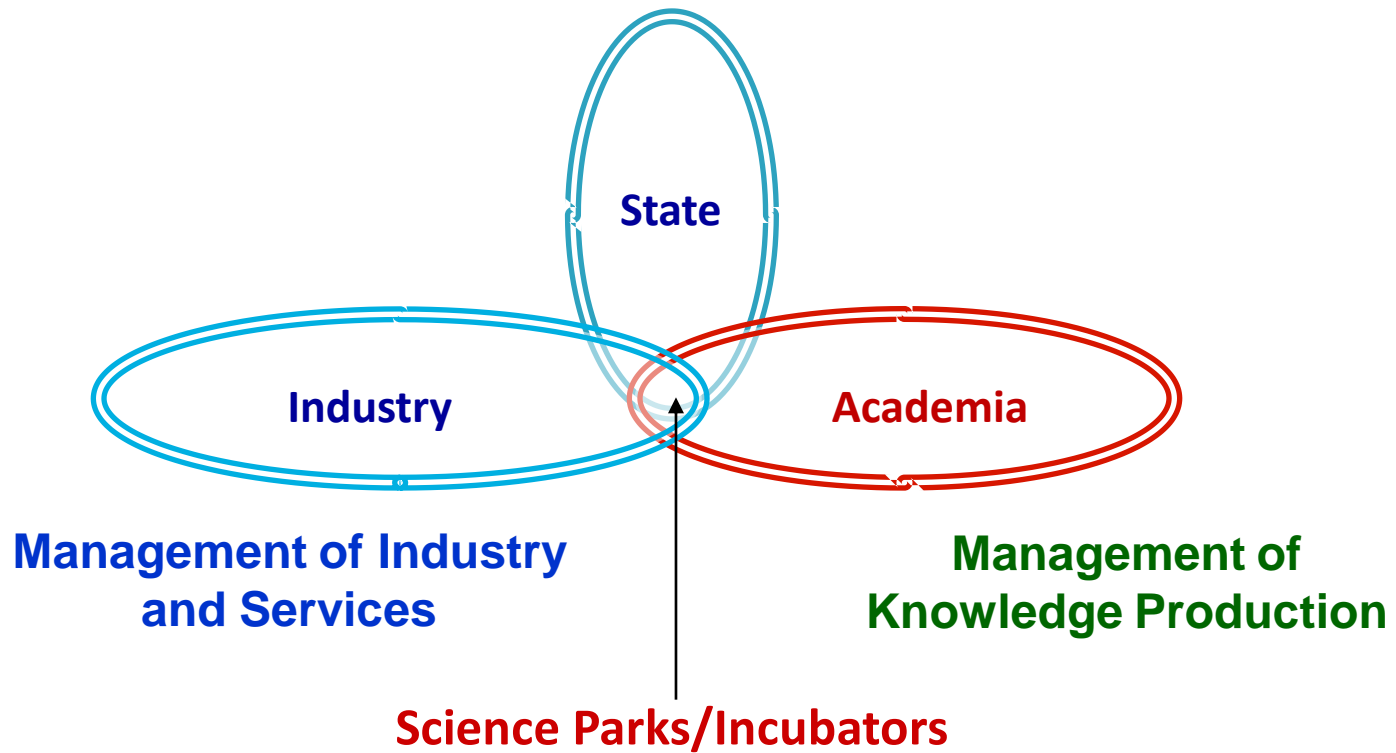
High quality of technical & entrepreneurial skills

Small flexible team, Job sub-contracting



THE LAISSEZ-FAIRE TRIPLE HELIX (H. Etzkowitz)

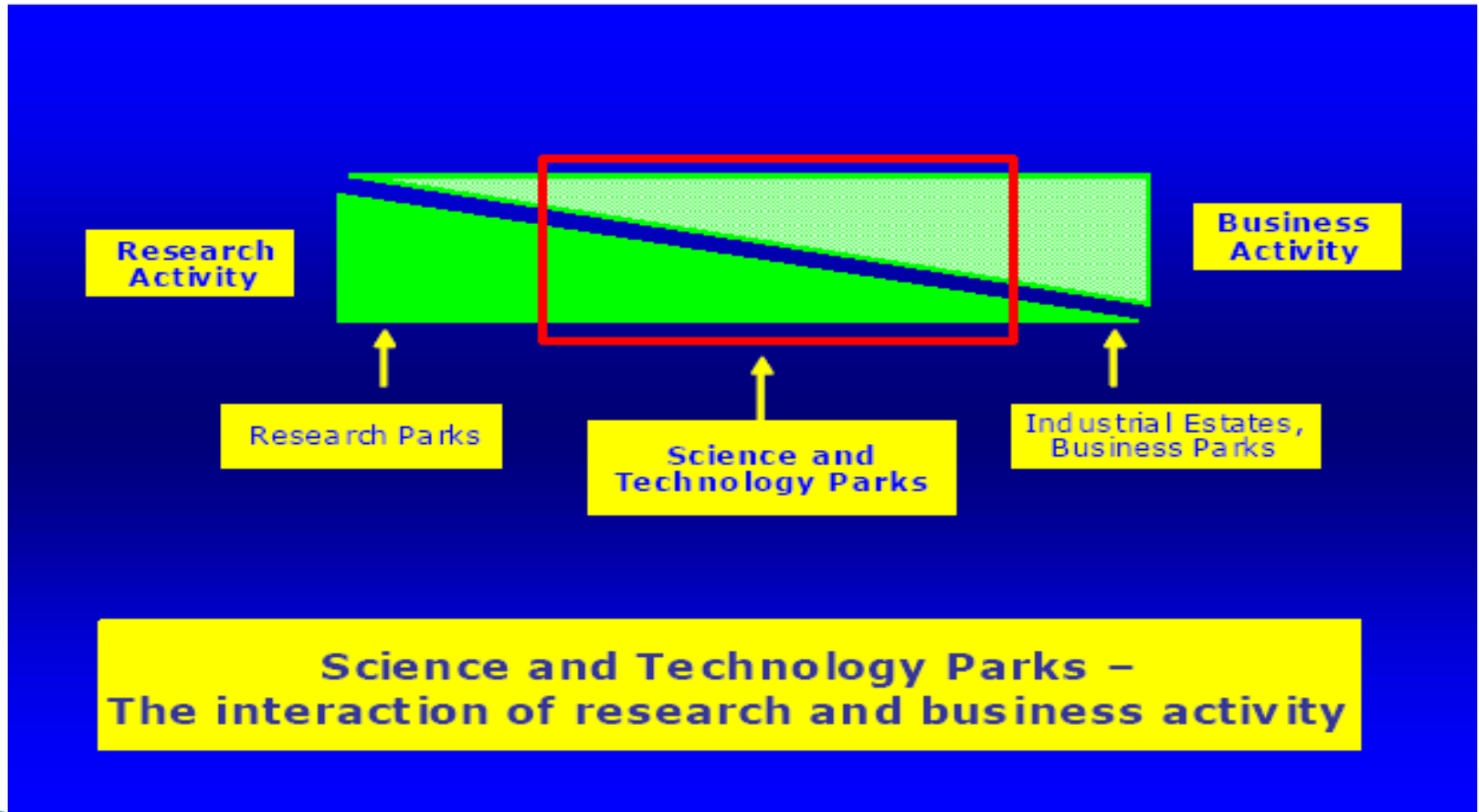
Democratic Management of Society



Transition from industrial to knowledge age



SPECTRUM OF STPs ACTIVITIES



MODELS OF STPs

- ▶ 1. North American model
Limited state intervention, mixed business and scientific activities (Silicon Valley)
- ▶ 2. French & Japanese model
Large Technopoles (Sophia Antipolis)
- ▶ 3. Scandinavian model
Medium to small Parks, indigenous development
- ▶ 4. South European model
Developed mainly during 80s and 90s with the support of EU Structural Funds (modernization of industry, new jobs creation)



ROLE OF STPs IN REGIONAL DEVELOPMENT

- ▶ ***They cannot play their role without other prerequisites.***
- ▶ ***3 Main goals:***
 - ***Promotion of Innovation based on regional competencies and competitive advantages***
 - ***Increase the regional competitiveness***
 - ***Attraction of investments through an integrated framework which must include:***
 - ▶ ***Stable political situation***
 - ▶ ***Tax system which favours business development and provides incentives***
 - ▶ ***Supportive framework***
 - ▶ ***Good Infrastructures and highly skilled people***
 - ▶ ***Brand name***
 - ▶ ***Quality of life and services (transportation, health, education, culture etc)***



PLANNING FOR A SCIENCE TECHNOLOGY PARK

(Multi-stage project, take over 10 years for maturity)

- ***Bringing together the right mix of partners***
- ***Undertaking a feasibility study and develop a master plan***
- ***Preparing a business plan and marketing study***
- ***Identifying a project champion to manage the creation of the Park***
- ***Creating the appropriate vehicle to run the project***
- ***Creating the developing team***
- ***Implementing development***
- ***Site promotion/marketing***
- ***Developing a package of business support services***
- ***Building a management system***
- ***Benchmarking performance***



CHARACTERISTICS OF SUCCESSFUL STPs

- ***Strict adherence to a clear long-term vision and purpose, embodied in a master plan***
- ***Central involvement of at least one major research organisation which:***
 - Understands that STPs are unique engine for high tech economic growth*
 - Has strong knowledge transfer capabilities*
 - Takes a collaborative approach that accommodates the needs of industry*
- ***A high value placed on the research institution connection in branding the Park and shaping its future***
- ***Strong interaction between the host academic/research campus and the Park (sensitive to distance, role of proximity)***
- ***Innovative and entrepreneurial project champion***
- ***STP Manager with strong leadership skills***
- ***Effective economic integration with the surrounding region***
- ***Support from the government (supportive environment)***



EMERGING TRENDS OF STPs

The world is changing rapidly, the STP model is also evolving

Emerging trends of STPs are:

- ***Orientation towards specialisation and clustering***
- ***Universities are taking a more active role in creating smaller STPs***
- ***Expansion of the Learning Villages/Science City concept***
- ***Continued dispersion of the STPs phenomenon***
- ***More involvement of the private sector***
- ***Higher level of integration between STPs and metropolitan/regional strategies***



TECHNOLOGY BUSINESS INCUBATORS

(Catalysts, Facilitators, Accelerators, ...)

Environment which support the development of a new venture in its early stages (sometimes virtual environment).

Venture Incubator (Full services)

Venture Accelerator (Usually offers consulting services, business planning, financing etc . Example: McKinsey)

Venture Portal (Web site or extranet) (e.g. garage.com) (evaluation of BP)

Venture Network (VC network /strategic investors. E.g.: Internet Capital Group)



MAIN GOALS OF INCUBATORS

- ▶ *Fighting unemployment through new business development, increase their survival rate.*
- ▶ *Support of regional economies or economies under recession*
- ▶ *Cultivation of entrepreneurial culture, support of entrepreneurship*
- ▶ *Development of specific technologies and industry/business sectors.*
- ▶ *Exploitation of research results (technology incubators, spin-off development)*
- ▶ *Support of regional and local development*
- ▶ *Restructuring of employment (e.g. in case of technology obsolescence)
(e.g. British Steel Industry, 1975)*



SCIENCE TECHNOLOGY PARKS IN GREECE

- ▶ *Idea for development: 80's*
- ▶ *Financing : Early 90's (Structural Funds, National & regional Funds) and 00's*
- *5 STPs established first (Patras, Crete, Athens (2) & Thessaloniki)*
 - *Initiated by Research Centres (FORTH, DEMOKRITOS)*
 - *Not very much involvement of the regional actors*
 - *Financial support for buildings and soft actions (Technology Transfer Centres, Incubators)*
- *2nd generation in the beginning of 2000*
 - *Financial support through the Structural Funds + 50 % private funds*
 - *STPs and Incubators*
 - *2 New Science parks and 8 New Incubators (4 still in operation)*
 - *Link with other programmes which support their development (spin-offs, Industry Liaison Offices etc)*



FORTH and its Institutes

www.forth.gr

FORTH consists of 7 Research Institutes located throughout Greece
Created 3 Science Parks (Crete, Patras, Thessaloniki)
The Foundation's headquarters are located in Heraklion, Crete

Ioannina:
Biomedical Research Institute (**BRI**)

Patra:
Institute of Chemical Engineering and High Temperature Chemical Processes (**ICE-HT**)

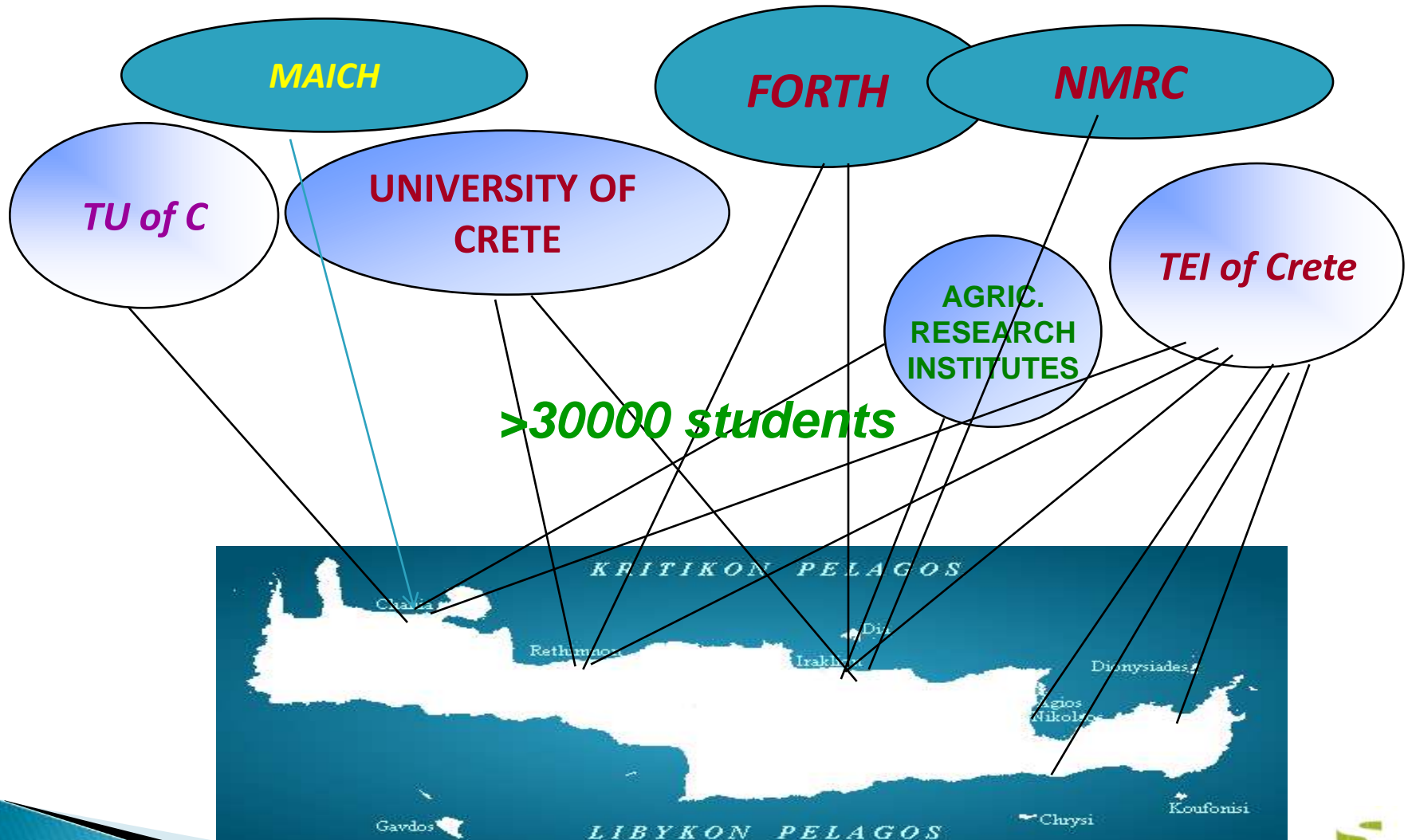
Rethymnon:
Institute of Mediterranean Studies (**IMS**)

Heraklion:

- Institute of Electronic Structure and laser (**IESL**)
- Institute of Molecular Biology and Biotechnology (**IMBB**)
- Institute of Computer Science (**ICS**)
- Institute of Applied and Computational Mathematics (**IACM**)



ACADEMIC & RESEARCH INSTITUTIONS IN CRETE



KEY ISSUE: RETENTION OF GRADUATES

- ▶ High level of mobility (in particular the best students)
- ▶ Only 35 % of the University graduates stay in Crete, less than 30 % of the graduates of the Technical University
- ▶ Brain drain is one of the most important problems for the region

Formal teaching of entrepreneurship started very recently at the Universities



Science and Technology Park of Crete (STEP-C)

- FORTH' s conception of the Park: Late 80s
- Construction of the buildings : 90s
- Managing Company : Established Dec. 1993

Mission:

- **Make available** FORTH's and other academic communities significant **research deliverables** for the development of the region and **become the 3rd development pole next to agriculture and tourism**
- **Encourage companies** to join the Park and become major vehicles of the Technology Transfer process
- Become a **Center of Learning**
- **Contribute to regional development**

Main competences:

ICT & applications

Biotechnology/Biomedicine

Materials & Laser applications

Tourism and services



Science and Technology Park of Crete (STEP-C) (2)

Incubator

- ▶ *Over 100 offices and flexible lab space constructed (~4000 sq.m)*
- ▶ *Financing: EU, National & Regional funds*
- ▶ *Incentives offered by FORTH*
- ▶ *Incentives offered by the National Government (spin-offs, Incubators, Technology Transfer)*
- ▶ *Sept. 2011 : 18 tenants*

Since 1995 : >1000 new jobs created , >60 new companies created

MANAGING COMPANY S.A. (EDAP)

- ▶ *Est. 1993, 22 shareholders*
- ▶ *Main shareholders: FORTH,
Bank of Piraeus*
- ▶ *Staff: 6 people*



Science and Technology Park of Crete (STEP-C) (3)

INCENTIVES OFFERED BY FORTH/STEP-C

- ▶ **LOW RENT:** Start-up ~ 10 Euro/sq.m-month, increases up to 20 Euro after 5 years of stay)
- ▶ **COMMON EXPENSES:** Cleaning of space, security, electricity, parking space, Network offered free of charge
- ▶ **INTERNET SERVICES:** Free e-mail και web hosting, free wireless
- ▶ **MEETING ROOMS:** Free of charge
- ▶ **SECRETARIAT SUPPORT:** Use of fax, photocopy, collection and distribution of mail, switchboard etc
- ▶ **SCIENTIFIC LIBRARY & RESTAURANT** (free use of library, access to restaurant)

SERVICES OFFERED TO TENANTS

- ▶ **ACADEMIC:** Links with academic and research labs , participation to research projects
- ▶ **TECHNOLOGICAL:** Access to FORTH Institutes and to Technology Transfer mechanisms
- ▶ **BUSINESS:** Business planning, market research, business development
- ▶ **FINANCIAL:** Information and support to financial issues, links with business angels and financial organizations
- ▶ **LEGAL:** Legal support, Intellectual Property Rights (Greek Patent Office Branch)



METHODOLOGY FOR TECHNOLOGY EXPLOITATION

- 1. Collaboration with the private sector for the establishment of New Technology Based Firms***
- 2. Collaboration with VC firms for spin-off financing***
- 3. “Institutional” Enterprises (FORTH Labs sell products and offer services to the private and public sectors, e.g. DNA enzymes, biotech products, laser applications)***
- 4. Establishment of New Technology Firms at STEP-C (private companies)***
- 5. Licensing agreements***
- 6. Support students and researchers to start up new firms***
Since 2003 a number of programs supporting students to develop new companies (some success, but most important change of culture)

Due to demand side limitations: Development and exploitation where competitive advantage exist (niche approach)



CRITERIA FOR SELECTION OF INCUBATOR COMPANIES

- 1. Homology between company needs and services offered by STEP-C***
- 2. Existing technology, IPR, patents etc***
- 3. Business plan which covers information about products or services, market, competition, cash flows projections, management team etc***
- 4. Intensity of cooperation with University, Research labs etc***
- 5. Business and research experience of the management team***
- 6. Personal commitment of the management team***



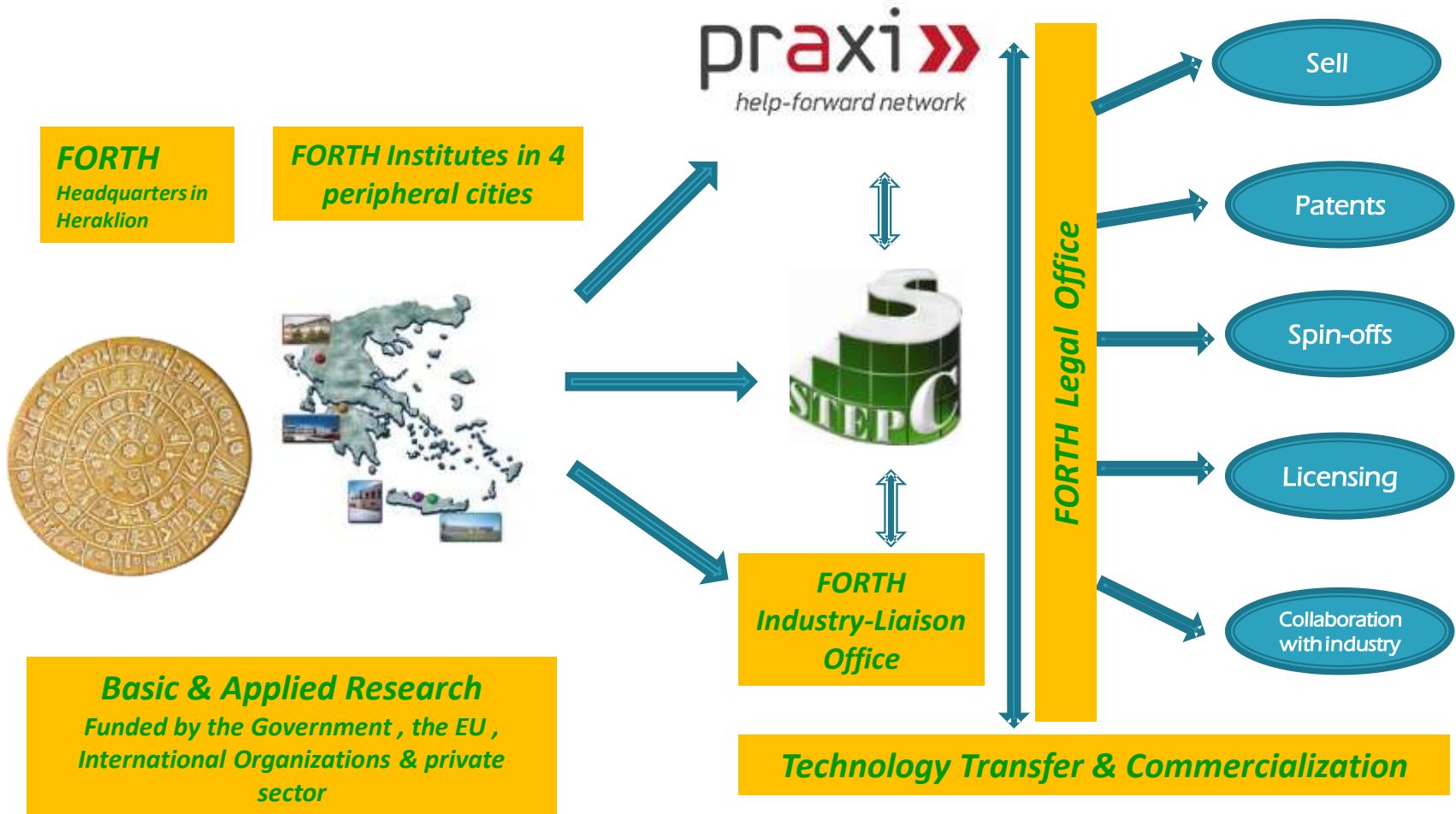
EXAMPLES OF FORTH SPIN-OFFS

- ▶ **FORTHNET** (Greece), telecommunications & internet services, created 1995, FORTH's share ~6 %, (www.forthnet.gr)
- ▶ **ART INNOVATION BV** (Netherlands), sales of diagnostic equipment for art works inspection, created 1997, FORTH share 13,82%
- ▶ **MINOS BIOSYSTEMS Ltd** (UK), commercialization of gene transfer techniques (using the transposable element MINOS) through the development of a patent portfolio, created 2000, FORTH share 30,67%
- ▶ **IMPERMEABLE AS** (Norway), commercialization of ground stabilization techniques with applications in the oil drilling industry, created 2000, FORTH share 10%
- ▶ **FORTH PHOTONICS Ltd** (UK), development of imaging technologies for non invasive diagnosis and screening of cancer, created 2002, FORTH share 18%
- ▶ **COMPITENT SA** (Greece), development of laser equipment for materials processing, created 2002, FORTH share 15%
- ▶ **NANOTHINX SA** (Greece), high-yield and low-cost production of carbon nanotubes, created 2005, FORTH share 15%
- ▶ **ADVENT SA** (Greece), new materials and systems for renewable energy sources such as fuel cells and photovoltaic systems, created 2005, FORTH share 10%
- ▶ **NANOCHRONOUS LOGIC** (Greece & USA), new company est. 2006 in the USA with its R&D department in Heraklion. Production of software for integrated circuits (ICs)





FORTH MODEL OF TECHNOLOGY TRANSFER



Collaboration with over 300 companies
Over 30 valid patents (National, EP, USP)



FORTH SPIN-OFF ACTIVITIES: INSTITUTIONAL ENTERPRISES

MINOTECH biotechnology (www.minotech.gr)

- ▶ *Production and distribution of DNA/RNA enzymes*
- ▶ *Production of cellular mass*
- ▶ *Protein purification services*

MICROCHEMISTRY

- ▶ *Production of custom oligonucleotides, DNA sequencing*
- ▶ **IMMUNODIAGNOSTICS**
- ▶ *Kits for diagnostics in plants and animal diseases*



COMPANIES CREATED BY STUDENTS & RESEARCHERS

Some Examples

- ▶ **INFOCHARTA Ltd**, www.infocharta.gr
- ▶ **INFOTRAFFIC**, www.infotraffic.gr
- ▶ **CYTECH Ltd** www.cytech.gr
- ▶ **NOVELTECH Ltd** www.noveltech.gr
- ▶ **VIRTUAL TRIP Ltd** www.v-trip.com

(Graduated end 2007)



REQUIREMENTS FOR THE DEVELOPMENT OF KNOWLEDGE INTENSIVE BUSINESSES

- ***Information - Training– Development of entrepreneurial culture***
- ***Preparation phase (ideas, human resources, Intellectual Property Protection, etc)***
- ***Scope – Business Planning***
- ***Infrastructure for business support (Incubators, Technology Parks, Innovation Centres etc)***
- ***Technology Support (Universities, Research labs)***
- ***Mentoring and coaching schemes***
- ***Framework conditions***
- ***Availability of financing (seed capital, business angels, VC etc)***



OTHER ACTIVITIES

- ▶ **Participation in a large number of national and European RTD projects (FP6, FP7, INTERREG, etc)**
- ▶ **Collaboration with a large number of European institutions and organizations**
- ▶ **Collaboration with regional and national authorities**
- ▶ **Organization of training seminars (addressed mainly to company needs)**
- ▶ **Promotion of academic entrepreneurship (students programme for support for the creation of new companies and training in entrepreneurship)**
- ▶ **Member of the Greek Network of Science Parks and the International Association of Science Parks (IASP)**
- ▶ **National Contact Point (NCP) for the FP7 PEOPLE Programme**
- ▶ **Member EURAXESS Network**



STEP-C INITIATIVES TO SUPPORT ENTREPRENEURSHIP

- ▶ ***UNISTEP Programme***: Financed by Crete Innovative Actions Programme as a pilot action. (2004-2005)
Training of 80 students, 20 Business ideas, 2 new companies already created
- ▶ ***UNISTEP Plus Programme***: Financed by the GSRT “Crete Regional Innovation Pole” (2007-2008)
Training of 80 students, 17 Business ideas, 1 new company almost ready to start
- ▶ ***PREMIO Project***: Training of 20 students and support to prepare Business Plans and prototypes (2008-2009), International cooperation (Portugal, Greece, Estonia, Romania)
- ▶ ***ENTER Project***: Training of 20 young entrepreneurs, support to prepare Business Plans and prototypes (2008-2009) (Portugal, Greece, France, Romania)
- ▶ ***ERASMUS YOUNG ENTREPRENEURS Programme***



ERASMUS YOUNG ENTREPRENEURS PROGRAMME

www.erasmus-entrepreneurs.eu

- ▶ *An initiative of EC/DG Enterprise, started February 2009*
- ▶ *Current projects, closing end June 2012*
- ▶ *New call 2012*
- ▶ *Participation of the 27 EU member states*
- ▶ *Supporting New Entrepreneurs (NE) to visit and stay together with a Host Entrepreneur (HE) in another country from 1 to 6 months*
- ▶ *Financial support up to 1100 €/month (depending on the country of stay) plus the cost of travel.*
- ▶ *Over 3000 applications so far*
- ▶ *Over 1000 HE and 400 NE available*
- ▶ *Over 1000 exchanges have already been completed, many more in progress*
- ▶ *On line application through the program website*
- ▶ *STEP-C: Intermediary organization for Greece*



THANK YOU

FOR YOUR ATTENTION

QUESTIONS?

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