



Conference of Rectors and Presidents of European Universities of Technology

Vienna University of Technology, Austria

 POLITECNICO DI MILANO



LINKING RESEARCH AND INNOVATION: FROM TECHNOLOGY TRANSFER TO TECHNOLOGY COOPERATION

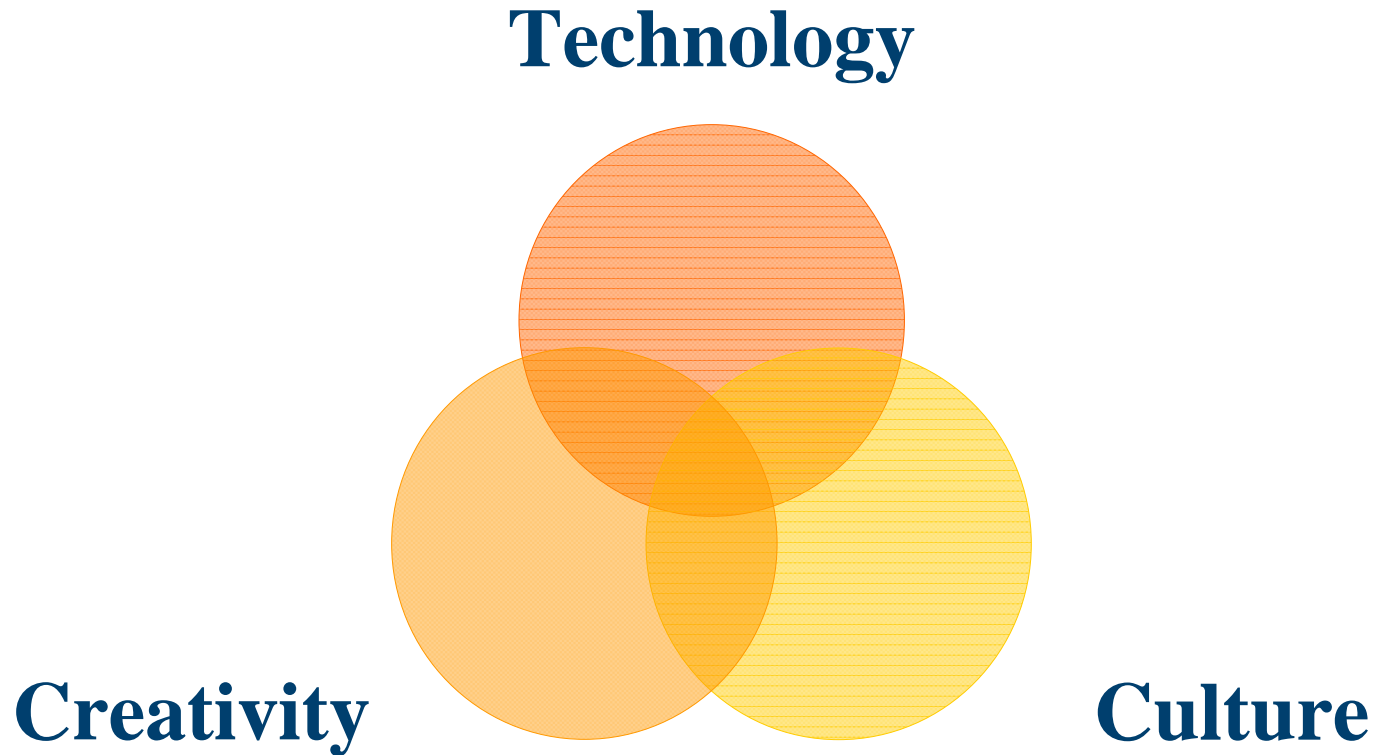
Prof. Giovanni Azzone



- ✓ **Politecnico di Milano: key figures and vision**
- ✓ **From technology transfer to technology cooperation**
- ✓ **Examples and results**



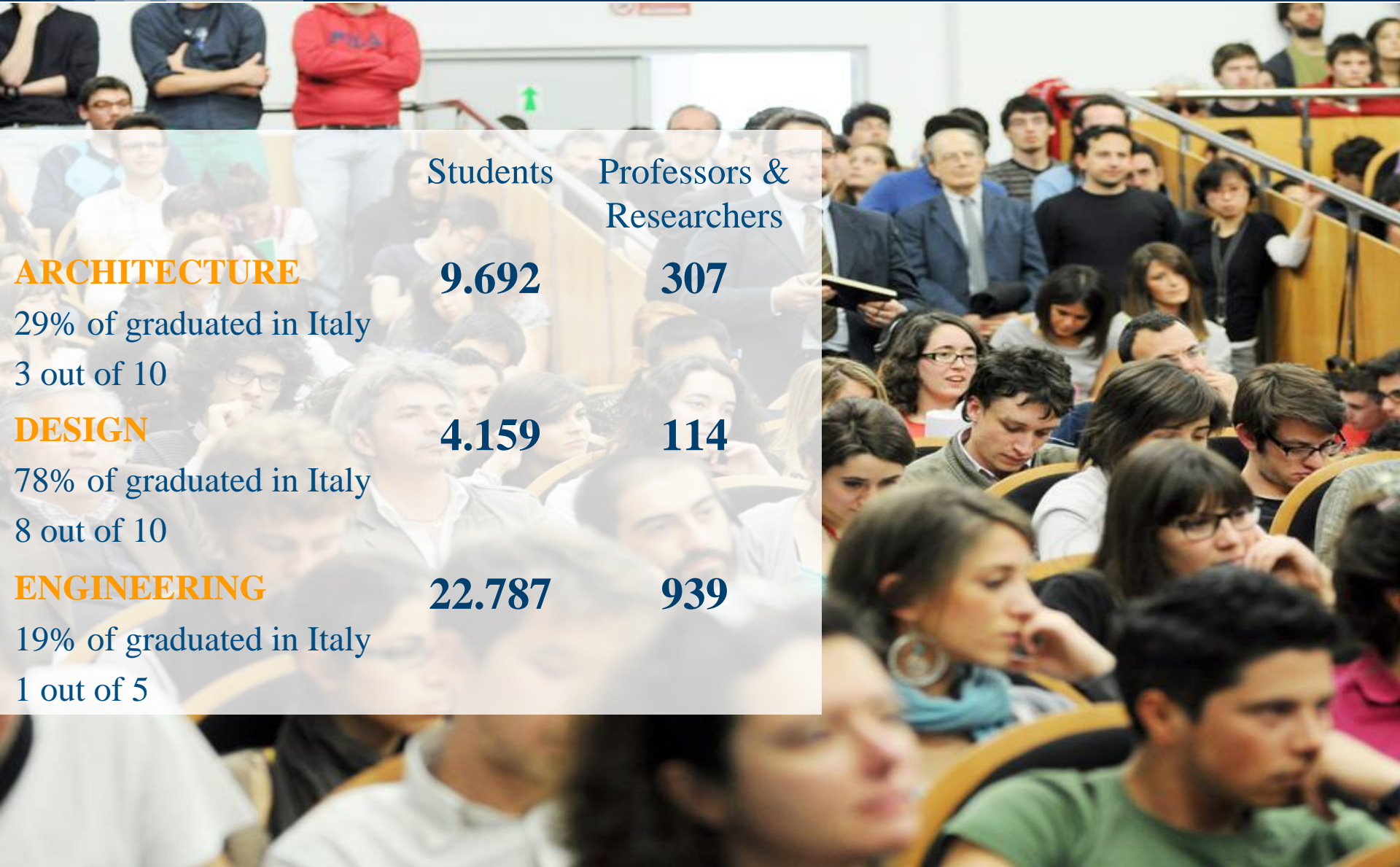
Integrating technology, creativity and culture to be a gateway between Milano and the world



Keywords: corporate relation and interdiscilnarity



Faculty & Students on 2010: a large university



	Students	Professors & Researchers
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ARCHITECTURE

9.692

307

29% of graduated in Italy

3 out of 10

DESIGN

4.159

114

78% of graduated in Italy

8 out of 10

ENGINEERING

22.787

939

19% of graduated in Italy

1 out of 5

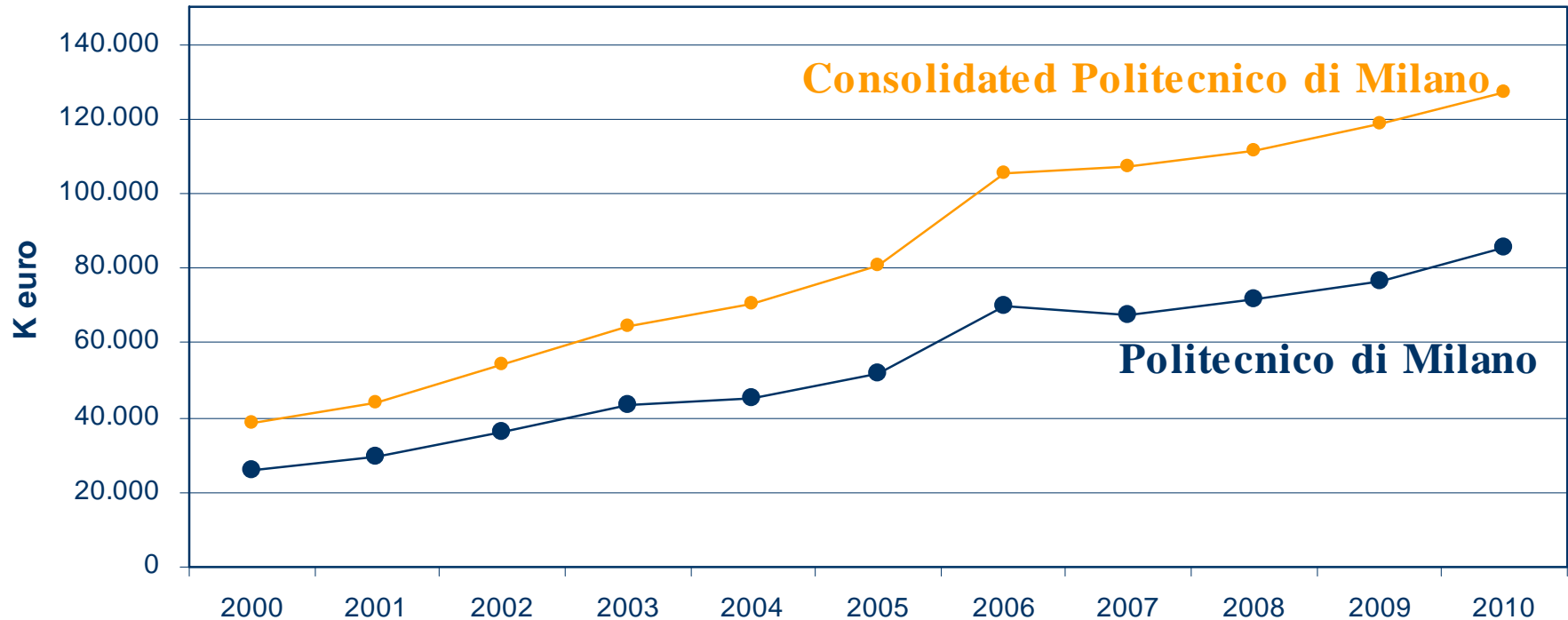


QS World University Rankings - Engineering & Technology 2011: No peak areas

	World	EU	Italy
Engineering & Technology	48	13	1
Computer Science & Information Systems Ranking	79	22	1
Civil & Structural Engineering Ranking	46	10	1
Chemical Engineering Ranking	84	24	2
Electrical Engineering Ranking	79	18	1
Mechanical, Aeronautical & Manufacturing Ranking	65	19	1



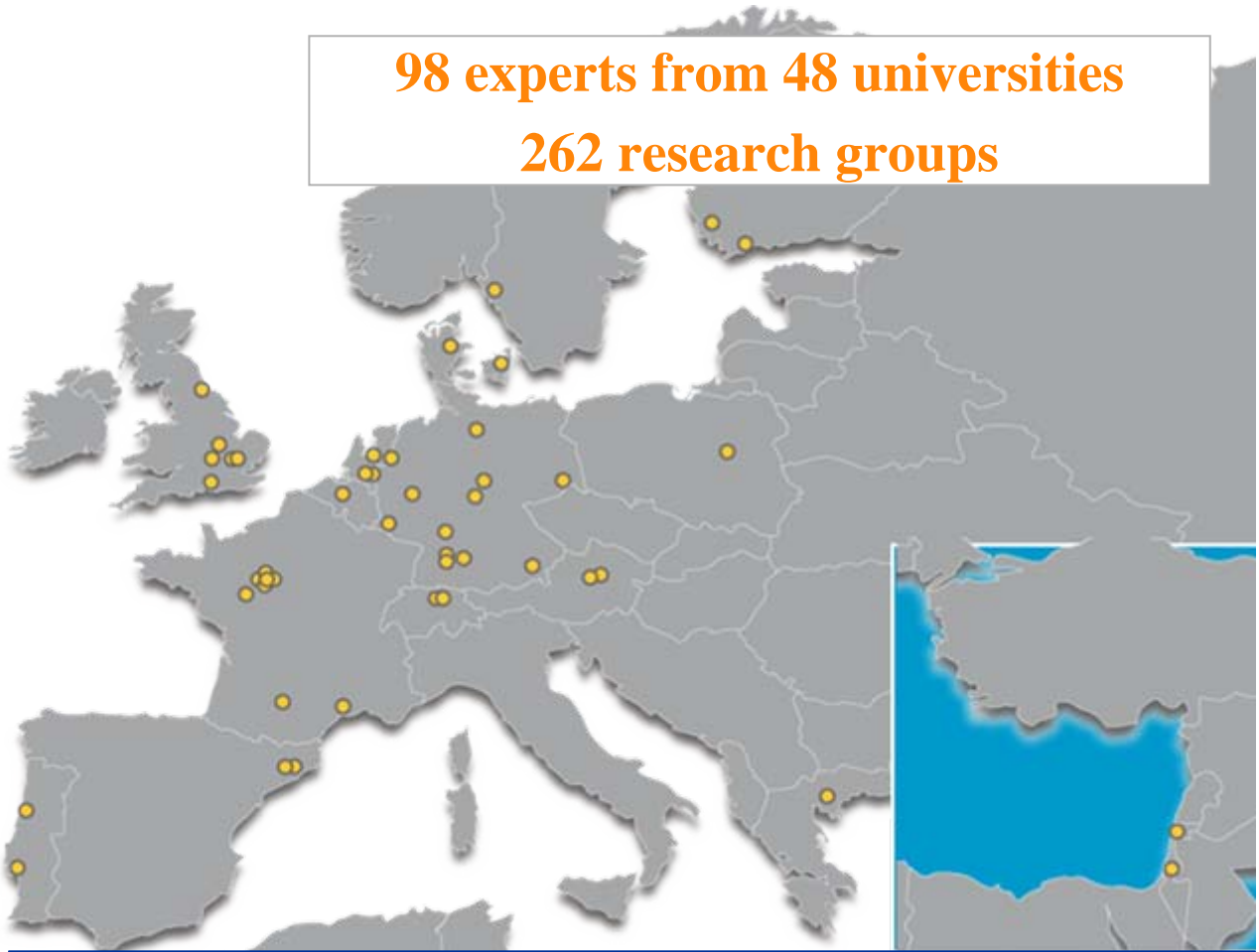
Step I: increasing industrial links: Funds from competitive sources



100k/FTE/Year



98 experts from 48 universities
262 research groups



Universität für
Bidenkultur Vienna

University of
Techonology Vienna

Hogeschool Sint-Lucas
Brussels

Aalborg Universitet
Danmarks Teknische
Universitet

Åbo Akademi
University Turku

ARK – House
Arkktehdit Helsinki

Commissariat à
l’Energie Atomique

Ecole de Chartes Parigi

Ecole des Mines Parigi

Ecole Nationale
Supérieure du Paysage
Versailles

Ecole Normale
Supérieure Parigi

EPFL Parigi

ESC Toulouse

Intitut de Sciences
Politiques Paris

German Aerospace
Center Koeln

Hochschule für
Gestaltung Offenbach
am Main

LBF-Fraeunhofer
Darmstadt

Max Planck Institute for
Solid State Research
Stuttgart

RWTH Aachen

Technische Universität
Clausthal

TU Darmstadt
TU Dresden

TU Munchen

Universität del
Bundesweir Hamburg

Universität Hannover

Center of Research and
Technology Hellas
Salonicco

Cranfield University

Imperial College
London

Northumbria University
Newcastle

Oxford University

Royal College of Arts
London

University of
Sounthampton

Hebrew University of
Jerusalem

Technion, Israele
Intitute of Technology
Haifa

NTNU Trondheim

Eindhoven University of
Technology

TU Delft

TU Eindhoven

University of Twente

Polish Academy of
Sciences Varsavia

Universidade Tecnica
Lisbon

University of Porto

School of Architecture
of Barcelona – UPC

Universitat Politecnica
de Catalunya

Chalmers University of
Technology

ETH Zurich
Swiss Federal Institute
of Technology Zurich



The reasons for a change

- ✓ **Peers comments:**
 - ✓ **Large number of partners**
 - ✓ **Low average amount of each grant**
 - ✓ **Few cooperations between groups and departments**
- ✓ **Resulted in:**
 - ✓ **Inefficiency in transaction costs**
 - ✓ **Ineffectiveness in building competence**
 - ✓ **Short term orientation**



The new approach

- ✓ **Focus on few corporate partners**
- ✓ **Codesign of research strategies**
- ✓ **The approach:**
 - **New principles: from technology transfer to technology cooperation**
 - **New tools: Joint Research Centers**



SCOPERIE

S



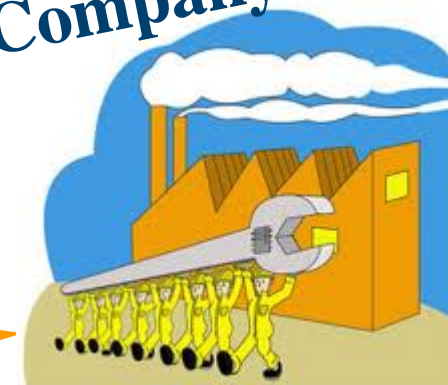
University



TT center



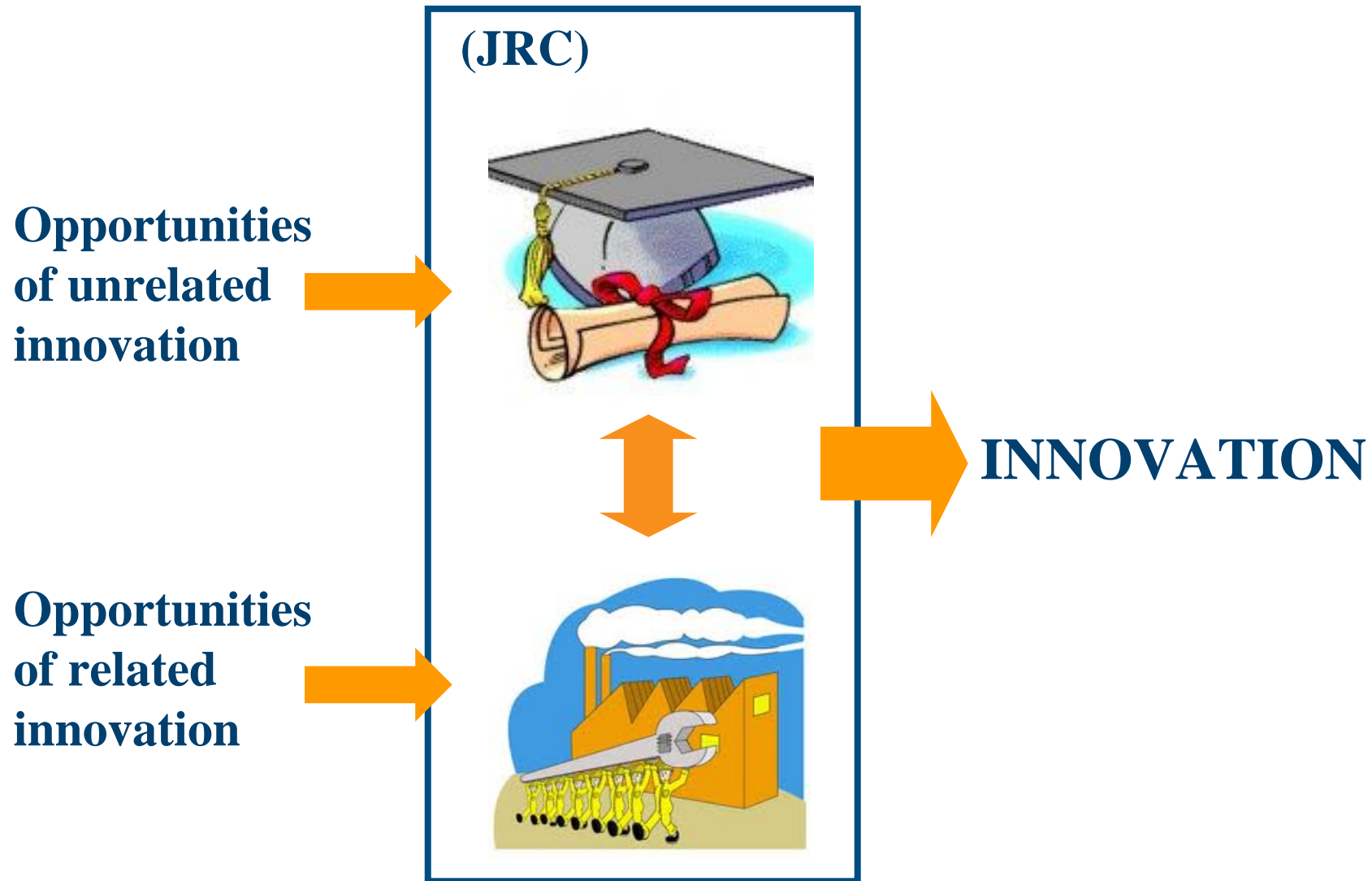
Company



NEEDS



Technology cooperation

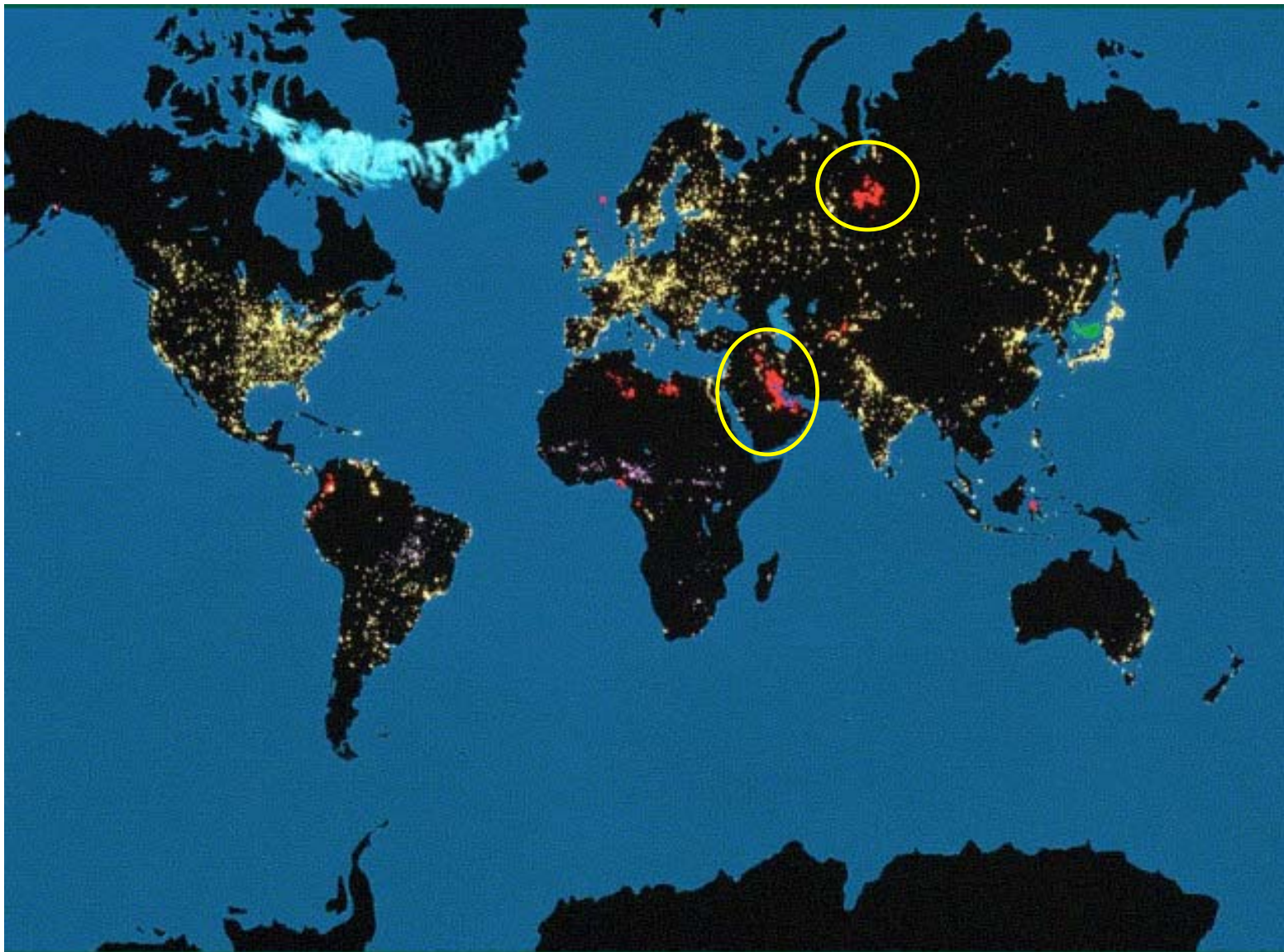




- Corporate management defining an ambitious issue to PoliMI researchers of different departments
- Follow up (two weeks later), ideas discussed between corporate and PoliMI researchers
- Codesign of ambitious projects by corporate and PoliMI researchers, than submitted to corporate management



A sample problem: gas flaring





Hydrocarbon exploration is a very difficult task.

- ✓ **Only about 25% of the basins potentially interesting for oil&gas exploration have been adequately studied**
- ✓ **Oil Companies often act in difficult contexts:**
 - **Remote and never accessible areas**
 - **Areas of political instability**
 - **Environmental constrains and risks associated to extraction**
- ✓ **Traditional geophysical and geochemical methods are expensive and need in situ surveys**
- ✓ **Even the most sophisticated techniques of investigation often reveal inadequate or contradictory**

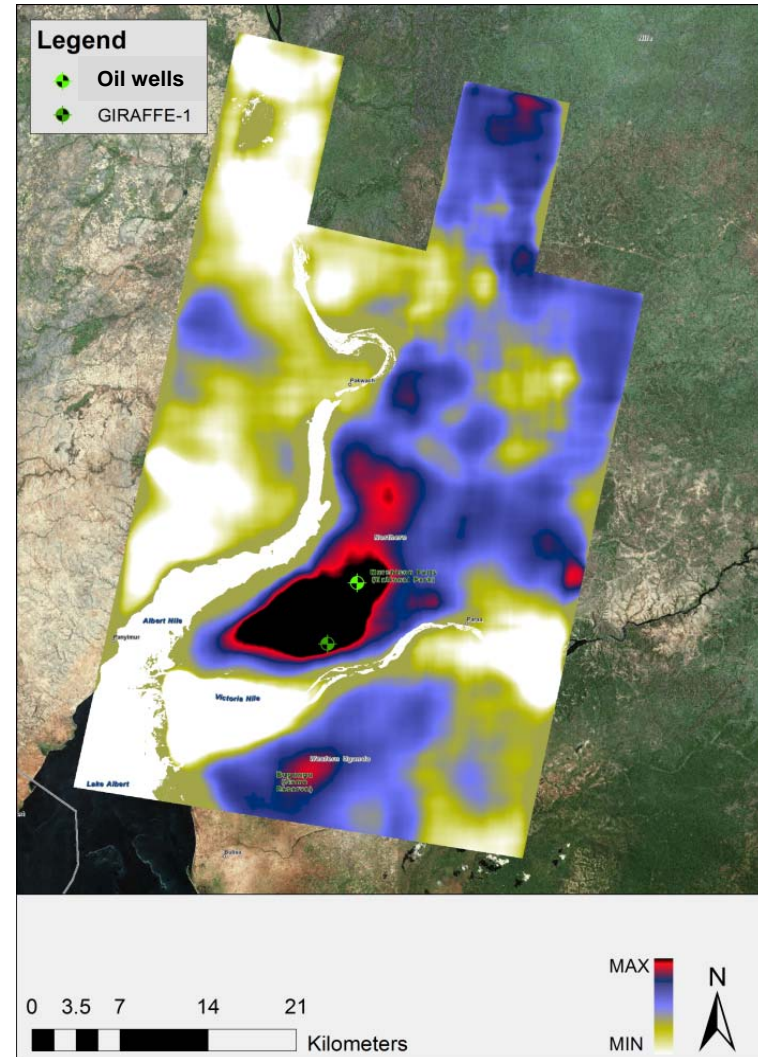


Modern satellite Remote Sensing technology can offer:

- ✓ **New breakthrough exploration tools for the oil&gas industry (e.g., hyperspectral, radar, gravimetry, LiDAR technologies)**
- ✓ **Remote access to worldwide areas**
- ✓ **Fast and cost-affordable survey of large areas**
- ✓ **Complementary data to traditional geophysical methods (e.g. 3D seismic)**
- ✓ **New thematic layers**



Hydrocarbon probability map
obtained from satellite time-series.





PMI: stimulating networks

- ✓ Roldresearch Network established by Elettrotecnica Rold, Componenti Vending and Fluidotech, 3 well known companies in the Milan industrial area, with Politecnico di Milano.
- ✓ New model for strategic partnership between university and industry in particular SMEs
- ✓ Initial funding :200 keuro/year for the next 3 years contributed by the SMEs' members.
- ✓ Roldresearch is an open project, ready to accept new partners and ideas with the ultimate goal of creating a permanent and relevant presence of SMEs in the field of industrial
- ✓ Research topics:
 - electromechanical science
 - electronic
 - special materials, polymers & metallic
 - industrial Design
 - wireless “smart” communications
 - fluid dynamics
 - advanced industrial design
 - energy efficiency & harvesting



Main Industrial Partnerships

Fondazione Politecnico di Milano

Indesit, Pirelli, Siemens, A2A, Luxottica

JRC Energy

A2A, ABB, Ansaldo Energia, Edison - EDF, Enel, ENI, Siemens, Siram

JRC Railway transportation

Trenitalia, RFI, Ansaldo Breda, Ansaldo Sistemi, Bombardier Transportation, ABB, Balfour Beatty Rail, Msa, Sirti, Contact

AWPark

Agusta Westland

Cefriel (ICT)

Alcatel-Lucent Italia, Compunetix Inc., Elettronica Industriale S.p.A., Engineering, Fastweb, Hewlett-Packard, Italtel, Microsoft, Nokia Siemens Networks, Pirelli & C. S.p.A., RCS Quotidiani, STMicroelectronics, Telecom Italia, Vodafone

MIP (Management)

ACCENTURE, ACER GROUP, BTICINO SPA, DANIELI, EDISON, ENI CORPORATE UNIVERSITY, FIAT GROUP SPA, IBM Italia S.p.A, INDESIT COMPANY, ITALTEL, PIRELLI, TELECOM ITALIA



Critical success factors

- ✓ **Commitment of corporate and university leaders**
- ✓ **Quality and reputation of partners**
- ✓ **Sharing strategic decisions**
- ✓ **People**