Sectors, industries, & markets
Supply chains & value chains
Standards
Network effects & economies of scale
Business ecosystem actors

Regional clusters
Regional clusters are subsets of a business ecosystem connected to a specific region or area.
• Mythical
  • Silicon Valley
  • Hollywood

• Massive
  • a narrow belt in the US. northeast and the eastern part of the midwest dominated US manufacturing up until the mid fifties
    – 64 percent share of manufacturing employment
    – today called the Rust Belt...

• In Belgium
  • Biotech and pharma
  • Petrochemical
  • Diamond trade
  • Car manufacturing
  • Government
Factors that trigger the emergence of clusters
- local demand
- prior existence of supplier industries
- natural resources
- innovative firms
- chance events.

Once a cluster is formed a self-reinforcing cycle promotes its growth
- support of local public and private institutions
- initial transitory advantages get "locked in" within the cluster
- Tipping point
- agglomeration economies attracting new specialized firms to locate within the cluster and gain from increasing returns to scale
REGIONAL CLUSTERS

- Critical mass
  - The existence of a large pool of individuals with specialized skills
    - reduced search and hiring costs
    - requisite quality skill set is easily available
    - individuals with skills are attracted to the cluster
  - The existence of firms providing specialized inputs

- Dynamics
  - High levels of technological spillovers and innovation due to proximity
    - since information flows are easier locally than over distances.
  - existence of sophisticated buyers
  - access to specialized suppliers gives high levels of flexibility and are able to implement innovations more rapidly
  - high levels of competition and peer pressure within the cluster act as an important stimulus for innovation.

- Trust and the related concept of social capital
  - deals in valuable diamonds are sealed by a handshake on the diamond exchange
  - when trust breaks down, unwritten rules must be codified and third parties brought in to resolve differences.

- Under certain conditions clusters slow technological innovation
  - resource diseconomies
  - insular competitive practices
  - lock-in in ageing technology
**Silicon Valley**

- Silicon Valley stretches about 100 kilometer between San José and San Francisco
  - “Core” Silicon Valley initially didn’t include San Francisco
  - Recently several startups located in San Francisco  
    - Uber, ...
  - Culturally and economically both are closely linked

**Mediterranean climate**

**Inhabitants:**
- Silicon Valley 2.44 million
- San Francisco 750,000
- Bay Area around 4 million.

In size and population the greater Bay Area is in the same order of magnitude as Flanders.
Silicon valley employment.
SILICON VALLEY

REGIONAL CLUSTERS

Industry concentration
According to the United States Census Bureau, of the 280 defined metropolitan areas, the San Francisco Bay Area has the highest median household income in the nation with $62,024 (40% above national average).
SILICON VALLEY

- Value added per employee in Silicon Valley’s industry clusters is $326,100.
- In 2004, the region’s value added is $224,200 per employee.
- This is more than two-and-half times US value added per employee.
Magnet for talent.
Nearly three-quarters of Silicon Valley women who work in computer, mathematical, architectural, and engineering occupations were born outside of the U.S., mostly in Asia.

Slightly more than 70 percent of men in those professions are foreign born.

"
REGIONAL CLUSTERS

BIOTECH CLUSTERS

[Map of Europe with stars indicating biotech clusters]
Scientific excellence
STANDING ON THE SHOULDERS OF GIANTS

- Flanders rich history of top researchers.
  - Marc Van Montagu and Jeff Schell invented the first method to genetically modify plants
  - Walter Fiers was the first in the world to sequence a full gene and a full genome
  - Désiré Collen discovered one of the very first successful biotech drugs (tPA)
  - Erik De Clercq and Rudi Pauwels developed most of the currently available anti-HIV drugs
  - Paul Janssen, one of the most prominent drug developers of the 20th century

- Political support
  - Sustained support by Flemish Government for biotechnology
  - Broad spectrum of tax and other incentives for biotech companies
    - one of the most generous subsidy schemes for R&D activities
    - one of world’s most attractive tax incentives for patented products
  - VIB as a catalyst for the regional cluster
    - start-ups have raised several € millions
    - turning out hundreds of trained people every year
    - signed hundreds of agreements with regional biotech companies, providing them access to novel technologies and products
Innovation in Flanders

- per capita, Flanders Life Sciences ranks
  - 2nd in # scientific publications
  - 1st in # patent applications
  - 1st in venture capital
  - 3rd in # drugs in the clinic
  - 2nd in # biotech companies

Source: presentation by Rudy Dekeyser, Managing Director Vlaams Instituut voor Biotechnologie VIB, during course ‘business aspects of biotechnology’
Within the European Union, Belgium and Flanders rank:

- #1 for biotech market capitalization
- #1 for clinical trial procedure speed
- #2 for clinical trial applications per capita
- #3 for pharma and biotech patent applications per capita
- #3 for number (bio)pharma researchers per capita
A FEW BIOTECH STARTUPS…
FLANDERS ECOSYSTEM ACTORS

- **biotech incubators and accelerators:**
  - Bioscape Ghent
  - Bio-Accelerator Ghent
  - Bio-incubator Leuven
  - Incubator Darwin Antwerp
  - BioVille Hasselt
  - JLABS Beerse
    - *part of Johnson & Johnson*
  - Food Port Tienen
    - *part of Feed Food Health Campus*
  - imec.iStart
  - Obelisc bio-accelerator offers

- **Science Parks focused on biotech and related fields:**
  - Tech Lane Ghent
  - Science Park University of Antwerp
  - BlueGate Antwerp
  - Arenberg Research Park
  - Haasrode Research Park

- **medtech-related R&D and business incubation:**
  - strategic research centers
    - *(VITO, VIB, imec)*
  - research and technology centers
    - *(IBiTech, NERF, IMO, Leuven Medical Technology Center, BIOMED)*
  - university hospitals
    - *(UZ Antwerpen, UZ Brussel, UZ Gent and UZ Leuven)*
  - specialized campuses
    - *Health Sciences Campus Gasthuisberg*
  - federations
    - *MedTech Flanders, beMedTech*
  - innovation clusters
    - *DSP Valley, flanders.health*
Contract Research Organisations

- Biogazelle (Ghent)
- Bio-Plus Safety Pharmacology (Mol)
- Bio4ward (Landen)
- BARC (Ghent)
- BioMARIC (Ghent)
- BioLizard (Ghent)
- BISC Global (Ghent)
- `Conforma (Destelbergen)
- Clinitude (Leuven)
- Digital Cell Imaging (Keerbergen)
- EMTEX (Sint-Martens-Latem), the European Center for Chirality (Ghent)
- EGAMI (Antwerp)
- Innogenetics Biologicals (Ghent)
- Icometrix (Leuven)
- KasaConsult (Hoegaarden)
- Medpace (Leuven)
- Ontoforce (Ghent)
- ProGenTomics (Ghent)
- ProDigest (Ghent)
- Q-Biologicals (Ghent)
- InnoSer (Hasselt)
- and more.

Venture Capital Funds investing in Biotech

- GIMV
- PMV
- Vesalius
- Capricorn
- BioVest
- QBIC
- Gemma Frisius
- Theodorus
- Vives
- LRM
- SRIW
- TOLEFI
- Investsud
- SFPI-FPIM
- V-Bio Ventures
Medical technology
• On the intersection of healthcare, nanotechnology, biotechnology and even cybersecurity.

Flanders-based start-ups and companies are at the top of their games.

Some contributed to major breakthroughs in
• advanced microscopy
• medical imaging
• biochips (for advanced diagnostics)
• active implants (pumps, drug delivery systems, neurostimulators)

Flanders home to numerous organizations active in medtech-related R&D and business incubation:
• strategic research centers
  – VITO, VIB, imec;
• university hospitals
  – UZ Antwerpen, Brussel, Gent Leuven
• specialized campuses
  – Health Sciences Campus Gasthuisberg
• federations
  – MedTech Flanders, beMedTech
• research and technology centers
  – IBiTech, NERF, IMO, Leuven Medical Technology Center, BIOMED
• innovation clusters
  – DSP Valley, flanders.health
### Chemicals R&D

**Major European R&D centers in Belgium:**

- **Total Petrochemicals Feluy**: the largest R&D center of the Total Group (500 employees)
- **Dow Corning**: European headquarter is established in Belgium, Seneffe (120 employees)
- **Procter & Gamble**: European Research Centre in Brussels is a global business unit for Home & Fabric R&D (450 employees)
- **Solvay**: Research & Technology – Brussels Center, the main R&D center of the group (275 employees)
- **Recticel**: International Development Centre in Wetteren (130 employees)
- **Agfa-Gevaert**: Important R&D activities in Antwerp (500 employees)

**Worldwide technical competence centers in the cluster of Antwerp**

- **BASF** Antwerp for MDI
- **Evonik-Degussa** for methionine
- **Bayer** for Makrolon
QUESTIONS?

marc.goldchstein@vub.be

Offices
Pleinlaan 5, Level 4
PL5.4.27