

2021 도시미래연구센터 콜로키움

혁신도시 브라이트 랜드를 통해 미래도시를 그리다

고려대학교 행정학과
안준모(Cantab)

말뚝의 눈물



글라스고



구미



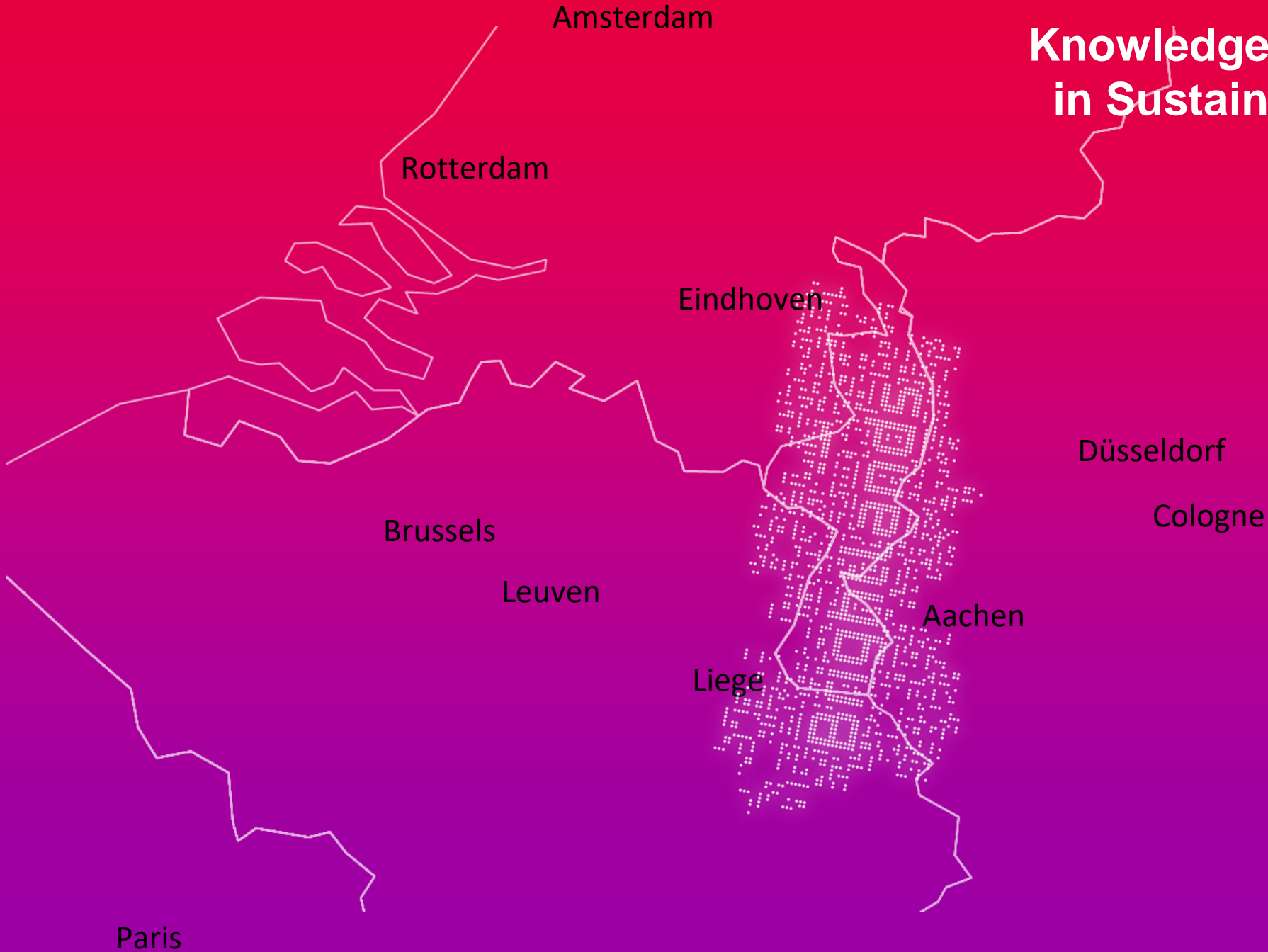
도시의 성장과 소멸 그리고 (경제적) 재생

- 경제적 재생의 지속가능성
- 혁신생태계(Innovation Ecosystem)의 역할
- Triple Helix Approach
- Brightland의 교훈

Brightlands

Knowledge crossing borders

Knowledge Crossing Borders in Sustainability and Health



Brigitte
Spiegel

Accelerating innovation in Health and Sustainability

Brightlands Maastricht Health Campus

Precision Medicine and Innovative Diagnostics
Regenerative Medicine

Brightlands Chemelot Campus

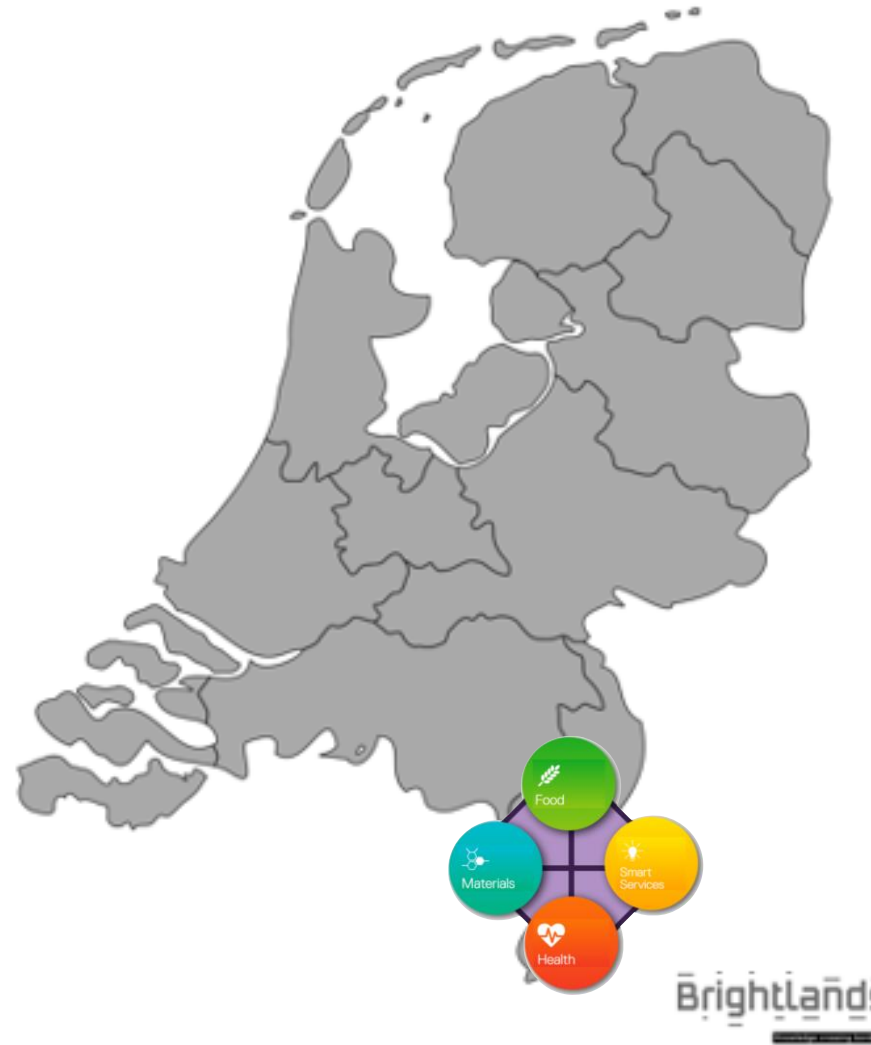
Smart Materials
Sustainable Manufacturing

Brightlands Smart Services Campus

Data Science
Smart Services

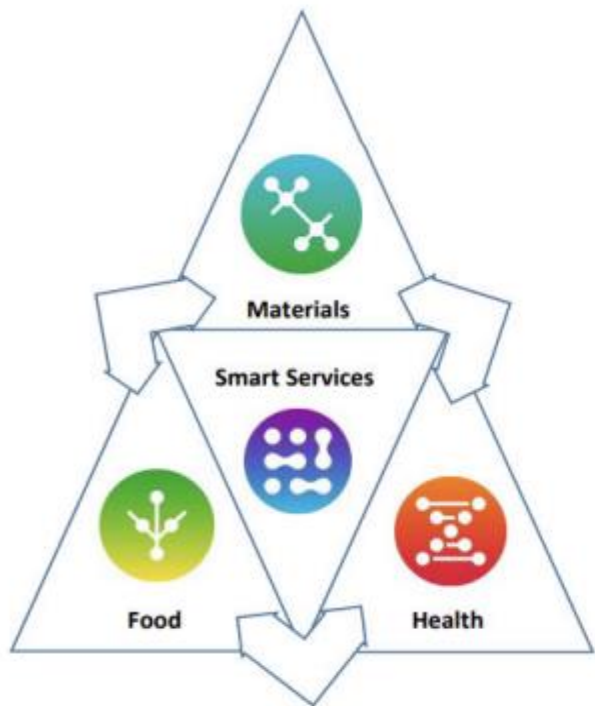
Brightlands Campus Greenport Venlo

Healthy Food
Nutrition



Brightlands

- Under the name Brightlands, four campuses have been set-up in Limburg where government, knowledge institutes and companies build ecosystems to jointly innovate around:
 - Smart materials and sustainable chemical processes (Sittard)
 - Health (Maastricht)
 - Safe & healthy food (Venlo)
 - Data science & smart services (Heerlen)



As of 2021
374 companies
15,331 jobs
13,143 students

222 companies
11.750 jobs
8.240 students

- Driven by global societal challenges and transitions
- Excellent fundamental & applied sciences
- Talent and community development (incl. education)
- Advanced, accessible & unique research infrastructures
- Knowledge transfer to entrepreneurial ecosystems

4 million people in three countries with 6 large universities,
5 international airports all within 100km of Heerlen



Brightlands



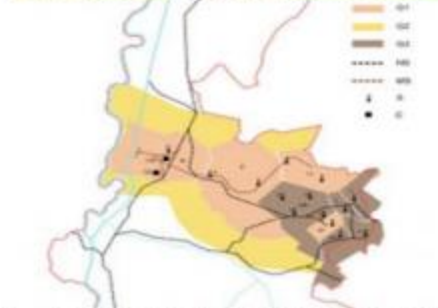
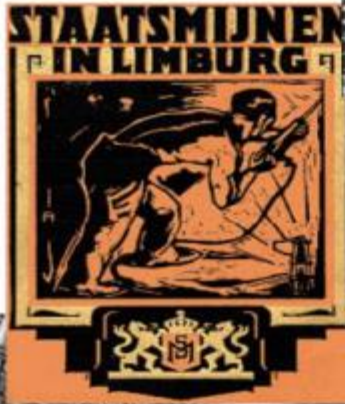
Brightlands Smart Services Campus

Brightlands

Brightlands_Chemelot Campus



A history of reinvention



The Life Sciences and Materials Sciences Company

Thank you.

DSM Venturing Unlimited. **DSM**

Brightlands

1965-1974

Closing of coal mining

National Investment

Dark Land

Transition

2010-

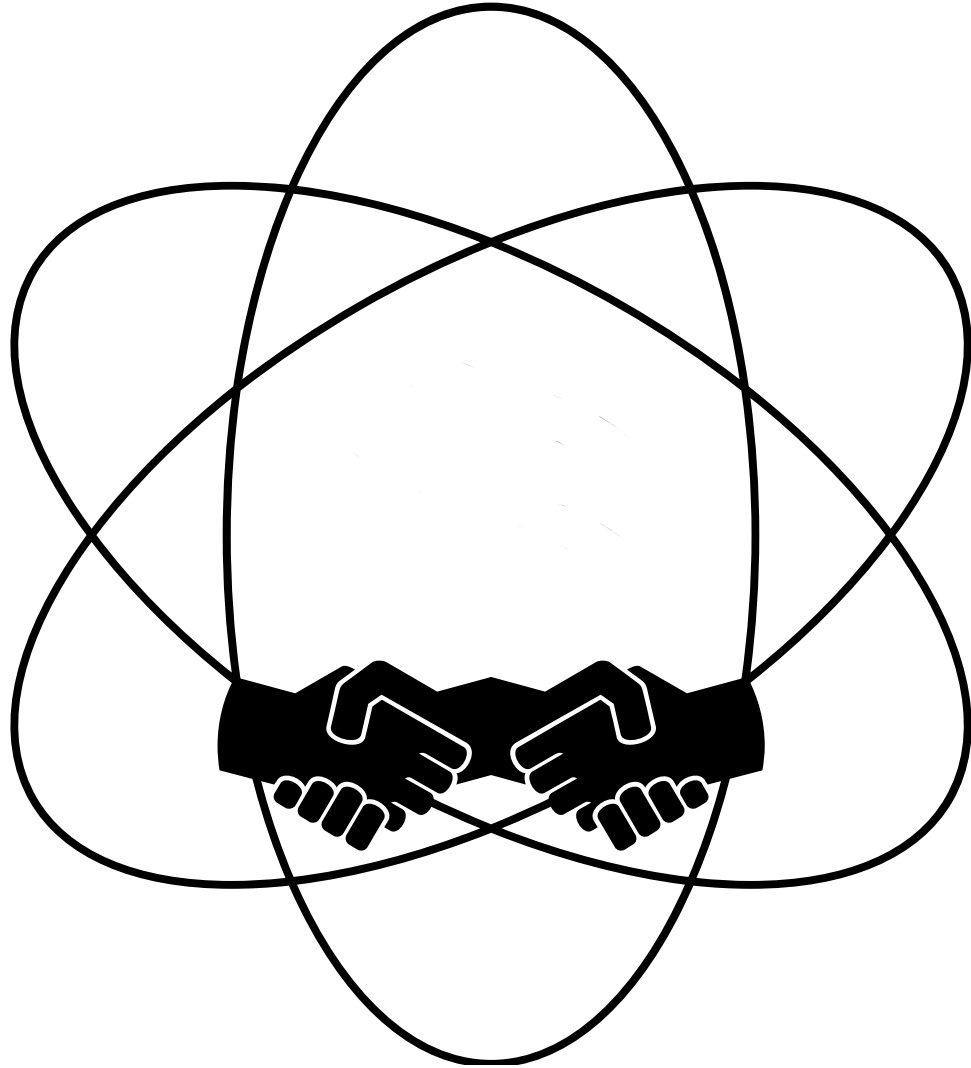
Innovation Cluster

Regional Investment

Bright Land

as tradition

Brightlands
Spernjubia



Triple Helix Approach

- Government
- Knowledge Institutes
- Companies

Triple Helix approach



Materials

Smart Materials and Sustainable Manufacturing

Sittard-Geleen



provincie limburg 




Health

Regenerative Medicine, Precision Medicine & Innovative Diagnostics

Maastricht



provincie limburg 



Smart Services

Data Science and Smart Services

Heerlen



provincie limburg 



Food

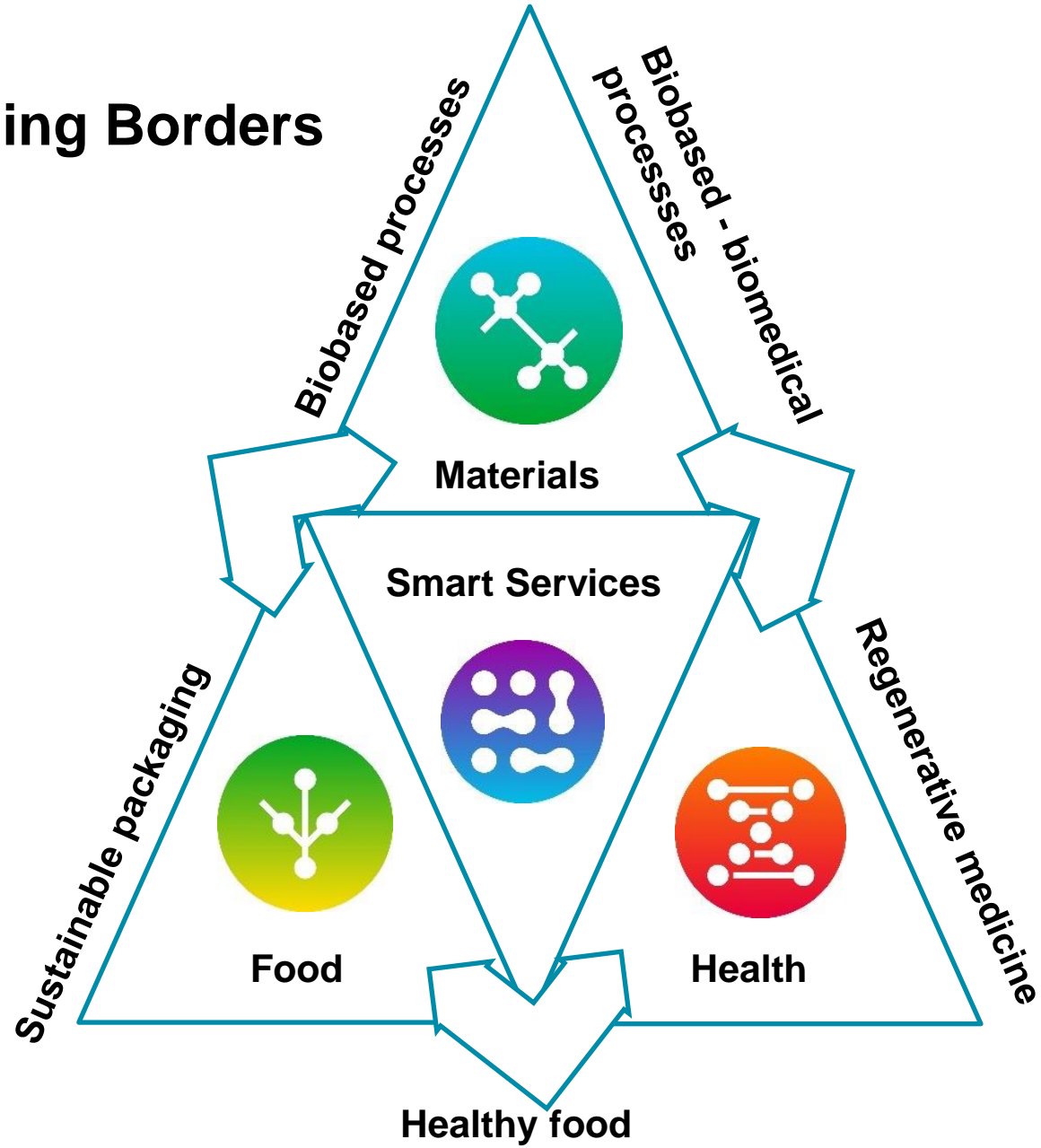
Healthy food & nutrition

Venlo



provincie limburg 

Knowledge Crossing Borders



Figures

	Chemelot	Maastricht	Heerlen * 2015-2025	Venlo	Brightlands totaal
Number of experts (now)	1900	7300	250	300	'10.000'
Number of experts (2023)	2900	7800	2.000	1000	'14.000'
Number of organizations (now)	75	55	25	15 op campus 300 in BING	'500'
Number of organizations (2023)	100	75	90	50 op campus 750 in BING	'1000'
Number of students(now)	660	7300	75	830	'9000'
Number of students(2023)	1000		800	1650 UM 200 HAS 800 Fontys 600 Overig 50	

Brightlands
Innovation Factory

Turning bold ideas into legendary companies

The quick brown fox jumps over the lazy dog and feels as if he were in the seventh heaven of typography together with Hermann Zapf, the most famous artist of the

“ Anything that won't sell, I don't want to invent. Its sale is proof of utility, and utility is success.”

Thomas. A. Edison

Homage to innovation
Printing press, Gutenberg
1430's, Germany



Open Innovation Community – Global, Interactive, Mutual Benefits

People make the difference



Triple Helix Approach : Companies



Royal DSM (Dutch State Mining)

- Founded in 1902
- Headquarter @ Heerlen, Netherlands
- Number of Employees 21,054 (2017)
- Revenue 8.632 billion EURO
- Its main products were commodity chemicals and petrochemicals by 1973 when last mine closed
- Current three domains : Nutrition, Materials and Innovation Center
- Netherland government floated 70% shares in 1989 and 30% in 1996



100-plus years of transformation

Our long heritage

BRIGHT SCIENCE. BRIGHTER LIVING.™

An ever-ambitious company

At DSM, reinvention is in our blood (we are a science company, after all). From the depths of the Dutch State Mines over a century ago we've transformed ourselves into something *truly bright*: a global science-based company specializing in ensuring the world is healthier, happier and safer. And we're still evolving....

Brightlands
Spernjubig

Brightlands_Chemelot Campus

Brightlands Chemelot Campus

- Open innovation around chemistry
- Income and jobs for the region
- Facilities, financing, community, education
- Today: 2900 jobs, 900 students, 100 companies
- Companies – 2900 jobs - 1000 students

Brightlands

Brightlands

Developing Smart Materials



SUSTAINABLE PACKAGING



OPTICAL AND ELECTRONIC DEVICES



LIGHTWEIGHT AUTOMOTIVE

RECYCLING



ENERGY STORAGE AND CONVERSION

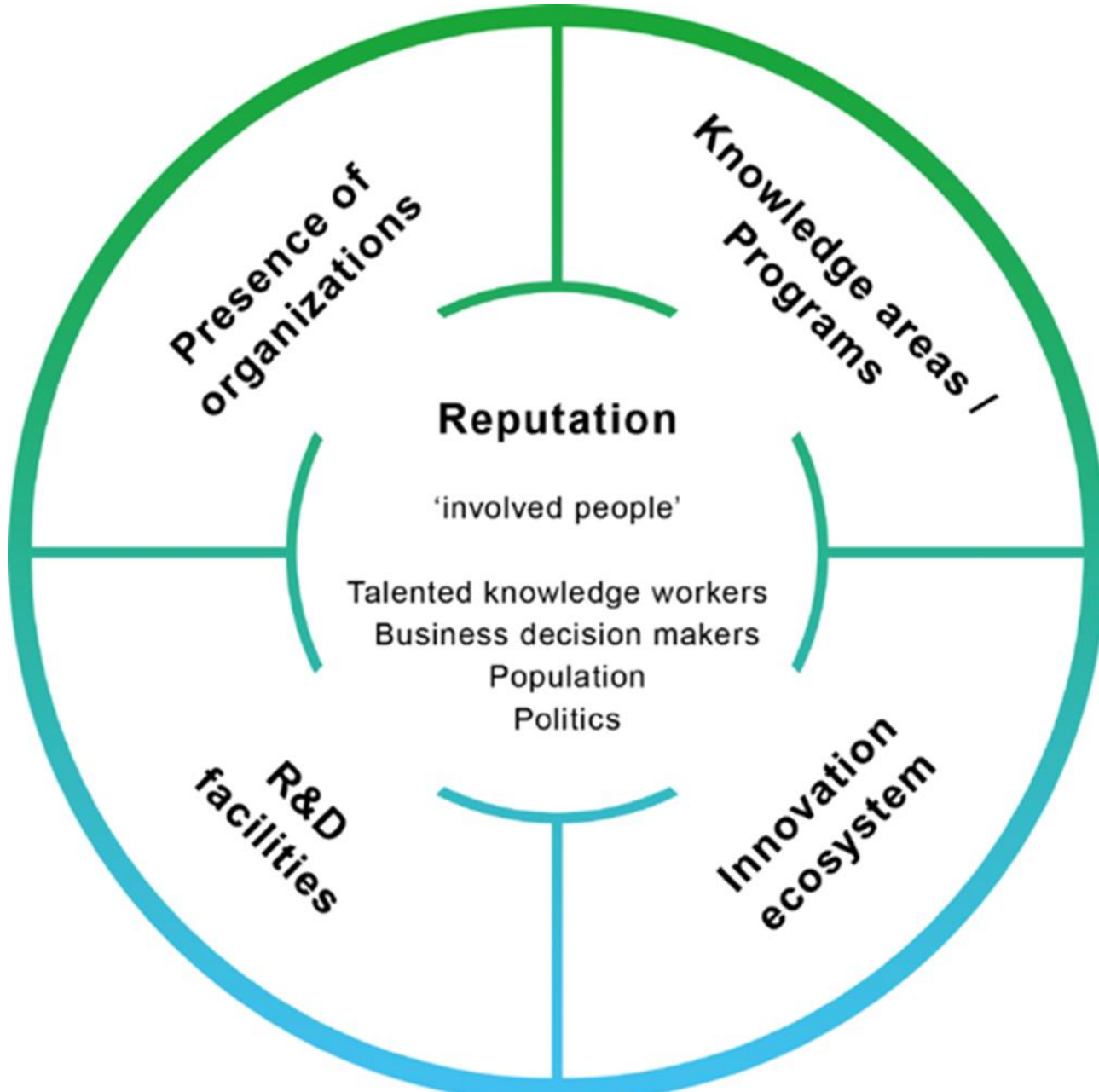


ADDITIVE MANUFACTURING



Brightlands

Bright Design of Campus





Societal Impact

Grand Challenges

Industry Drives

Customer Needs

Sustainable Manufacturing



Sustainable Site/Location

Sustainable Applications



Sustainable Value Chains



Digital transformation
Sustainability transformation

Presence of knowledge-based organizations

Corporates	   
Startups	   
SMEs	   
Education Partners	    
Scientific Centers	    

Brightlands

3D printing - ecosystem

18
companies and
institutes



13,5 M€
projects and
infrastructure

35
Brightlands employees
involved

17
PhD positions

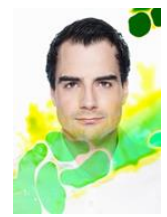


64
companies and
institutes with
contacts and projects

**Brightlands
Materials Center**



Chemelot Innovation and Learning Labs



7
print technologies

19
3D printers

Brightlands Chemelot Campus

Planned investments 2013-2019 (in M€)

Real Estate Programme	200-250
Scientific Centers	30-200
Pilot & Mini Plant Facilities	75-150
Chemelot Campus Development Programme	40
Valorisation	40-60

Total	485-700
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Investments Province of Limburg	190-200
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Brightland Chemelot Campus 건물 구조

- Brightland Center Court는 별3개 등급을 받은 지속가능한 건물(저온난방시스템)

*지하: 스포츠 홀

*1층 : 카페, 다양한 레스토랑, 상점 등과 같은 상업시설 입점



Brightland Chemelot Campus 건물 구조

*2층: 연구공간 및 컨벤션 센터

*3층: 연구공간

*4층: 혁신센터

desk 임대 월 € 100~ € 300

장단기 임대가능



DSM Venturing

DSM currently have over 35 companies in its portfolio.

DSM specializes in human nutrition, biomedical, solar and 3D printing.



[Bio2 Technologies](#) is an orthopedic surgery company commercializing implants constructed from their bioactive, resorbable material Vitrium®.



[LECT](#) is developing a novel manufacturing process to make silicon wafers with higher efficiency and lower cost that fit into existing module manufacturing processes without any changes.



[Adaptive3D](#) is the premium additive manufacturing polymer resin supplier. We partner with global leaders to deliver solutions for functional end use products and prototypes.

DSM Collaboration

- 독일의 글로벌 화학회사 BASF SE는 이질적이나 사업화가 시급하지 않은 경우 직원들이 해당 기술을 가지고 외부에서 사업화 가능성을 타진하도록 허용

[BASF SE – DSM 협업 사례]

- BASF SE는 혁신적인 기술의 사업화 가능성을 타진하기 위해 희망하는 직원을 DSM이 운영하고 있는 네덜란드 Bright land 혁신클러스터(Chemelot Campus)에 파견
- 파견된 직원들은 Chemelot Campus에 상주하며 마스트릭트 대학 교수/연구원/학생, 혁신클러스터에 입주한 스타트업 들과 아이디어를 교환하며 비즈니스 모델을 구체화
- 파견 종료 시, 평가결과에 따라 사내 기술사업화 또는 분사화를 결정하며, 분사화를 할 경우 파견된 직원에게 창업기회를 우선 부여

Brightlands – Chemelot recycling ecosystem

Current players active in polymer recycling



J/V Niaga, polymerization expertise and facilities.
DSM Resolve, DSM Aces



Chemical polyester recycling (carpet, fabrics)



Analytics, polymer application development



Polymer application development



Chemical recycling of polyolefins to cracker feed



Chemical recycling of PET to monomers



Polymer application development expertise



Materials and process technology scale-up expertise



Sustainable materials development



Mechanical recycling of HDPE/PP to near-virgin



Mechanical recycling of agricultural film



Application development, materials processing expertise



Sustainable Process Technology research program



Multi-Purpose Pilot Plant facilities (polymerization, catalysis)



Polymer development, materials analysis expertise

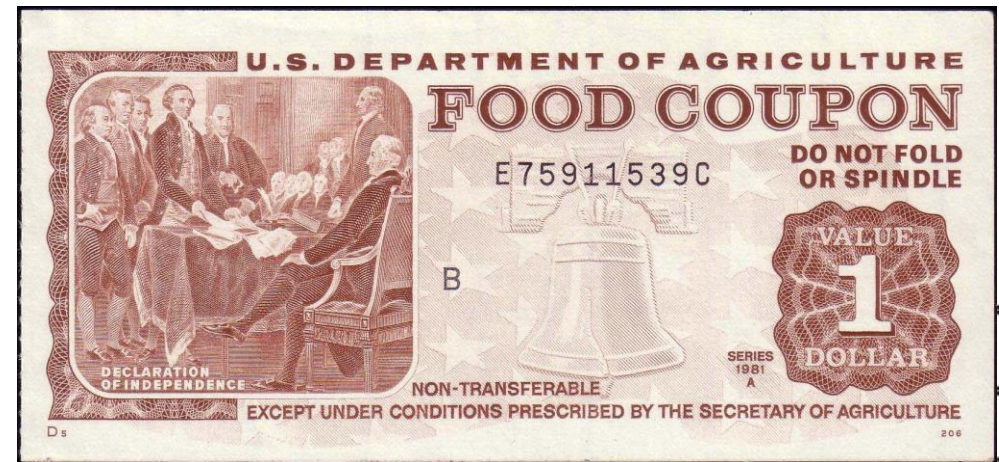
Brightlands
Chemelot Campus

Brightlands

Innovation Voucher

Concept:

유럽각국 정부가 **중소기업이 주도**하여 대학, 연구소 등과 **파트너십**을 맺고 원하는 기술혁신을 지원받을 수 있도록 **혁신서비스 구매권**을 제공

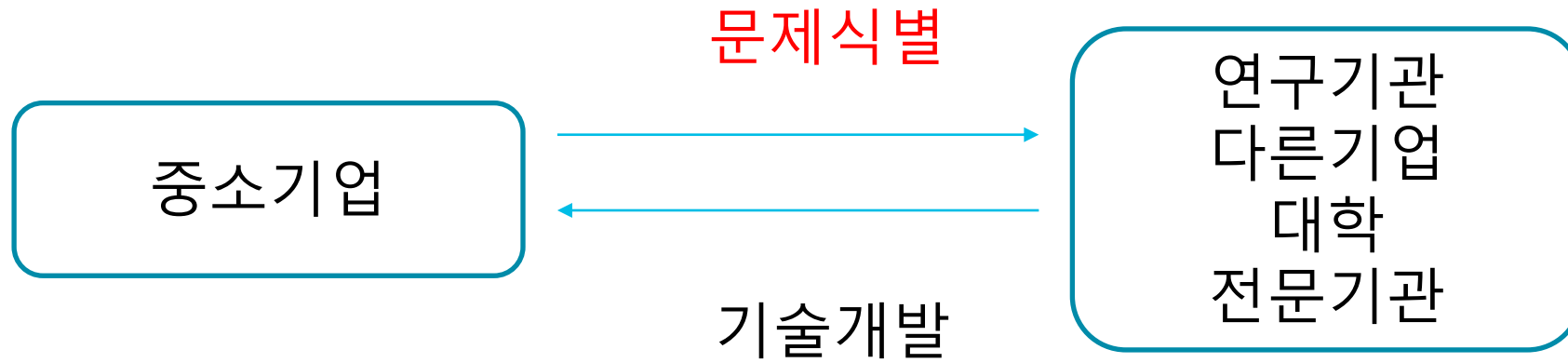


squarejuba

Innovation Voucher의 정책목표

- (1) 중소기업이 기존 대기업 위주의 수직적 가치사슬(vertical value chain)에서 벗어나 대학-연구기관 같은 **수평적 협력(horizontal collaboration)**을 실행
- (2) 혁신지원자금이 연구개발 지원이라는 **본연의 목적**에 사용될 수 있도록 유도
- (3) 기업이 스스로 원하는 혁신지원을 받도록 함으로써 **사용자 주도형 혁신** 추구

Innovation Voucher: 기본 개념



	Unknown Problem	Known problem
Unknown Solution		
Known Solution		대부분의 중소기업

아일랜드/북아일랜드

- 아일랜드

Standard voucher: 5,000 EUR

Co-funded: 50%-50%

(max 10,000 EUR)

기업당 최대 3장(1개는 con-funded)

	아일랜드	북아일랜드
대상	농업분야 기업을 제외한 모든 중소기업(SMEs)	
	자영업자 불가	자영업자, 스타트업 가능
목적	참여기업과 공공분야 지식제공기관의 상호협력 증진	
	.	새로운 제품, 프로세스 개발
결과물	보고서, 도안, 기술명세서, 기술 로드맵, 제품 및 프로세스 제품	
종류	· Standard Voucher · Co-Funded Fast Track Voucher	3가지 Funding Level로 차별화 (1st, 2nd, 3rd)
지원시기	· 연간 4회의 모집기간, · Co-Funded Fast Track Voucher (상시 모집)	연간 3회의 모집기간
성실실패허용	첫 지원에서 실패했을 시, 재 지원 가능. (피드백 부여)	
유효기간	발행일로부터 12개월	발행일로부터 9개월

- 네덜란드 (Limburg지역) : Type A
 - 오직 계약된 기관에서 3년 이내에 사용 가능하며, 지식제공기관을 **과학기술 기반 회사인 Royal DSM으로 한정**
- 독일 (Baden-Wurttemberg지역): Type A, B, C
 - 정보통신, 재생가능 에너지, 나노기술, 헬스케어 분야 50명미만 기업지원
 - 바우처 사용금액은 2,500~6,000유로, 독일외 지역에서 사용가능
 - 신청기업 중 70%가 이전에 연구기관과 협력한 경험이 없었음
 - 90%이상의 바우처가 지역기관에서 사용됨
 - 1/3이 공공연구기관, 2/3가 민간 지식서비스 제공기관에서 사용됨

Triple Helix Approach : (Local) Government



Limburg Province Government

- One of the 12 provinces
- Population : 1,118,223 (2019)
- Capital : Maastricht
- City Regeneration Plan : Innovation Driven
- Brand
- Collaboration facilitator

Brightlands
Knowledge crossing borders

Brightlands



MENU

Brightlands

Knowledge crossing borders



Brightlands
Campus Greenport Venlo



Brightlands
Chemelot Campus



Brightlands
Maastricht Health Campus



Brightlands
Smart Services Campus

Cooperation across borders

Brightlands has been made possible thanks to a partnership between the Province of Limburg, Maastricht University, Zuyd University of Applied Sciences, Fontys University of Applied Sciences together with APG, BASF, DSM and Maastricht UMC+. Brightlands is supported by the Ministry of Economic Affairs, private companies and various European, national and local public funds and municipalities. It is a partnership that goes beyond geographical, organizational and scientific borders.

provincie limburg



Maastricht University



BASF
We create chemistry



DSM
BRIGHT SCIENCE. BRIGHTER LIVING.



Maastricht UMC+



Zuyd
Hogeschool **ZU
YD**

Brightlands
Spuerthuis

Triple Helix Approach : Knowledge Institution



Maastricht University

- Public Research University (by Limburg province)
- Established in 1976 (Note that in 1973 the last mine was closed)
- To cope with the shortage of medical professional and to contribute to restructuring efforts in Limburg which was experiencing economic challenges following the collapse of the Limburg coal mining industry
- Academic staff : 2,301
- Administrative staff: 1,703
- Students: 21,085
- Focused on medical training and material/chemicals

Brightlands Maastricht Health Campus

Maastricht



103 companies



9,541 jobs



6,929 students

R&D facilities

- Scannexus: imaging for the world's leading Ultra High-Field MRI scanners (3T, 7T, 9.4T)
- Proton Therapy: precision treatment for destroying cancer cells
- State-of-the-art analytical equipment
- Cleanrooms, laboratories and accommodations for startups

Knowledge institutes

- Maastricht UMC+
- MERLN: regenerative medicine
- M4I: research on new molecular (imaging) diagnostics
- MAASTRO Clinic: oncology
- Maastricht University:
Faculty of Health, Medicine and Life Sciences
(in connection with Maastricht UMC+)
- Maastricht University:
Faculty of Psychology and Neuroscience
- Maastricht School of Management

Brightlands_Greenport Campus



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Campus Greenport Venlo

Brightlands_Greenport Campus

Our themes

1. Healthy and Safe nutrition
2. Future Farming
3. Alternative raw materials and sources for nutrition
w/ crossovers to Logistics and Manufacturing Industries



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Future Farming



Brightlands_Greenport Campus

Companies



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Campus Greenport Venlo

Brightlands

Brightlands_Smart Service Campus



Our Hackathons: kicking-off new innovations, talent-development, startups and cooperation within the ecosystem

Brightlands_Smart Service Campus

Some examples

- Blockchain for zero-cost pension administration
- Medical data exchange between academic hospitals using blockchain
- Enabling local communities to facilitate “in-kind” pension arrangements
- Decentral mechanisms for handing out medical supplies
- VERA: Virtual Emotion Recognition Agent
- Robo-advisory in asset management
- Carbon footprint : data visualisation
- AI in Talent Management & Recruitment
- Energy Neutral housing
- Pay per use services (like laundry, light)
- Using AI to optimize river transport
- Personal Health System for COPD patients

"transforming data into smart services to improve the quality of life"



Brightlands_Smart Service Campus

Current community

Brightlands



TECH RUPTION

Startups program 1 fall 2017

- Topl.co
- Right origins
- Saga.one
- Yieldport
- Alvis.io
- One2Go
- Block Material
- Consense

Startups program 2 spring 2018

- Blockheating
- Barbecane
- Prop.az
- Crypto Payment System
- Topsheff enterprises
- Smart Futures
- InsureVite
- Vitalgia
- Appsforce



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BRIGHTLANDS
Chemelot Campus

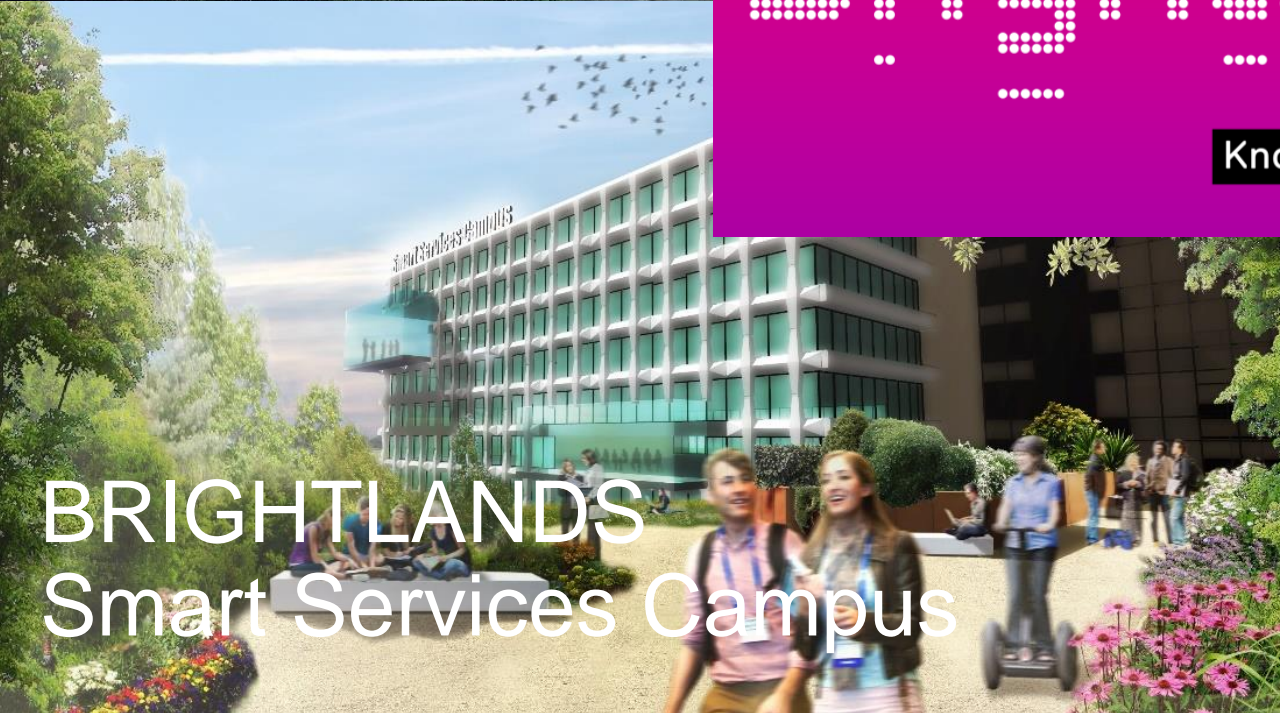


BRIGHTLANDS
Maastricht Health Campus



Brightlands
Knowledge crossing borders

BRIGHTLANDS
Smart Services Campus



BRIGHTLANDS
Campus Greenport Venlo



구 분	(미) 스탠포드	(영) 케임브리지	(영) 옥스포드	(미) RT	(미) 보스턴	(대만) 신주	(네덜란드) 브라이트 랜드	(한국) 판교
구성주도	지자체 대학	대학	대학	지자체 대학	지자체 대학	중앙정부 지자체	지방정부 대학, 기업	지자체
클러스터 핵심주체	대학 혁신기업	대학	대학	3개 대학	여러 대학 종합병원 기업	중앙정부	기업, 대학	지자체
주요 산학협력 시스템	스탠포드 대학 OTL	Cambridge Enterprise	Oxford University Innovation	대학별 TLO		신주단지 관리국	브라이트랜드 캠퍼스	경기도 창조경제 혁신센터
클러스터 형태	앵커기관 중심	앵커기관 중심 → 도시화된 과학연구단지	-	도시화된 과학연구단지	앵커기관 중심	산업단지	도시형 혁신 클러스터	도시화된 지식기업단지
지원관리 기관	Stanford Research Park	Cambridge Science Park 등	-	리서치트라이앵글 재단(RTF)	Massachusetts Life Scie ncesCenter	신주산업발전전략 연맹	Brightland + 다수기관	경기도 경제과학진흥 원
주요강점	실리콘밸리 혁신기업과 대학의 시너지	대학의 혁신리소스 및 글로벌 기업의 R&D센터	체계적 산학협력 시스템	낮은 물가, 3개 대학의 혁신리소스	연구중심 대형병원, 글로벌 제약기업	강력한 정부지원	다수기관의 협업 캠퍼스별 특화 다국적 협업혁신	지자체의 장기지원, 우수한 정주여건

Conditions for Successful Transition

- Three fits : Strategic Fit, Cultural Fit and Operational Fit
 - Top – down vs. Bottom-up ? Middle-up?
 - Triple Helix based on mutual collaboration for common goal/direction
 - Open innovation
 - Scalability (in terms of domain, size and coverage)
 - Visionary leadership
 - Continuity of policy
- + Life Style (MZ) ?

**Thank you for your attention !
Any questions?**

Joonmo@korea.ac.kr