Conference
Sustainability - the next level
31 May 2018
Erasmus University Rotterdam
“SPRANKELEND IN HET GLAS, LOEPZUIVER EN ZEER VERFIJND”

Erik van Loo

Parkheuvel
** Michelin Restaurant
Sustainability - the next level
Education in Transition: what does it mean to EUR?

Rotterdam, 31 May 2018
We do not live in an era of change but in a change of era
The world’s most valuable resource
19th CENTURY
- Industrial revolution
- Fear for machines
- Long-lasting turbulence
- Social inequality
- Marx

21st CENTURY
- Digital revolution
- Fear for robots
- Increasing turbulence
- Social inequality
- Piketty
Great Transition

societal transition

economic transition

ecological transition
New Economy

digital
decentralized
distributed
sustainable
circular
ECONOMY 3.0

- blockchain
- 3D-printing
- internet of things
- artificial intelligence
- quantum computing
- nano-neuro-biotechnology
New Society

cooperative

community-based

personalised

fluid

value-driven
SOCIETY 3.0

- Bottom-up
- Communities
- Commons
- Glocalisation
- Value-driven
- Cooperative
Anthropocene

era in which humans influence the Earth system has profound consequences for humans

climate change
plastic soup
extinction of insects
New Heat Record Antarctica: 17.5 °C
Conclusion

sustainability becomes the basic tone in society

sustainability at the core of new business models

sustainable development goals leading for countries

sustainability is part of all disciplines
Sustainability should be part of all curricula at the University
Sustainability in Education

as a normative orientation

as a perspective on the world and humans

as a philosophical notion

as a practical guiding tool
Current State EUR

no master on sustainability [covering depth & width]

in bachelor bits and pieces of sustainability

part of university college and honours programme
80% of students at EUR do not get in touch with sustainability
Urgent Sustainability Plan

integral plan for the next 10 years

sustainability in all bachelor programmes

variety of sustainability master programmes

transition thinking should be part of it
WHAT IS A SUSTAINABLE UNIVERSITY TO YOU?
EDUCATION IN TRANSITION

FOR A CRITICAL, CONSTRUCTIVE & RESPONSIBLE MINDSET
1. MAKE SUSTAINABILITY CORE COMPONENT OF CURRICULA
2. PROVIDE TRAINING TO TEACHING STAFF
3. CENTRALIZE INITIATIVES THROUGH SUST. OFFICE
REACH OUT TO OUR TEAM

educationintransition.eur@gmail.com

WE WERE:

JANA VAN DEN BERGEN

ALMAR BOK
Let’s make the EUR the most Sustainable University in Europe!
Sustainability
- the next level
SUSTAINABLE ROTTERDAM

Asmae Belhirch
Sustainable Programme Manager
SUSTAINABLE PROGRAMME 2015-2018 “CLOSER TO THE PEOPLE OF ROTTERDAM”

Ambitie 1
- Groene, gezonde en toekomst-bestedende stad
  - Schoon Lucht
  - Meer Groen
  - Duurzame wegen

Ambitie 2
- Schoonere energie tegen lagere kosten
  - Energiebesparing voor bewoners
  - Energiebesparing voor ondernemers
  - De Industrie als Verwerker
  - Wind door Wind
  - De Zon als Bron

Ambitie 3
- Sterke en Innovatieve economie
  - Kansen voor CleanTech
  - Sterkere ontwikkeling van de door energie
  - Koploop circulaire economie
  - Ontwikkeling van de koolstof economie
  - Schoon transport en logistiek
Programma Duurzaam

Energie transitie

Circulaire economie

Klimaat adaptatie

Energie systeem

Gebouwde omgeving

Haven & regio

Zerokopula mobiliteit

Energie transitie
INTERNATIONAL PARIS CLIMATE AGREEMENT

- Climate target: “well below 2 degrees”, i.e. an 80-95% reduction in emissions EU

EU
- An 80-95% reduction in greenhouse gas emissions by 2050, 30% renewable energy generation by 2030. Clean energy for everyone (winter package, EED, ERD).
- Compulsory implementation of the Integral National Energy & Climate Plan (INEK)

NATIONAL COALITION AGREEMENT, ENERGY AGREEMENT, CLIMATE AGREEMENT, CLIMATE ACT

- Working towards an affordable, reliable, safe & low CO2 energy supply in 2050. A 49% reduction in emissions by 2030

REGIONAL REGIONAL ENERGYSTRATEGY

- Regional tasks, mixed energy, source strategy: support for national and local targets

ROTTERDAM ROTTERDAMS CLIMATE AGREEMENT AKKOORD, NEW COALITION PROGRAMME

- Objective, transition pathways, lines of action, measures
- Complying with national guidelines
10% van de uitstoot is “stedelijk”
90% is “haven industrieel complex”
THIS IS THE ENERGY TRANSITION FOR **ROTTERDAM**

What are we aiming for?

Rotterdams stedelijk “budget” vanuit Parijs: 36,4 megaton CO₂
(Dat mag Rotterdam maximaal nog uitstoten tot 2050 om binnen de marge van 1,5 graad opwarming te blijven)
Bij business as usual: binnen 13,5 jaar is budget opgebruikt
Nieuwe energie voor Rotterdam
RECOMMENDATIONS FROM DRIFT & ROYAL HASKONING

- **DRIFT** (Pathways to Paris):
  - Making explicit policy for phasing out fossil fuels.
  - Making alternatives more attractive.
  - Displaying leadership by setting a good example.
  - Lobby for financial & legal preconditions & scope: central government and possibly EU
  - Experimenting: focusing on new and pioneering practical experiments
  - Harvesting the low-hanging fruit

- **Royal Haskoning/DHV** (Cleantech research):
  - Initiating, fostering & controlling PPPs (triple helix)
  - Facilitating & stimulating through satisfactory financial tools
  - Facilitating & stimulating through the right policy and regulations
  - Utilising the role of supervisor, licensing authority & proprietor
  - Putting our own house in order and active external orientation
CONTENT OF THE TASK

Energiemix / Bronnenstrategie

Woningen/VG Aardgasvrij / CO2-arm

FINANCERING

CO2 Reductiemaatregelen tot 2050

Duurzame Mobiliteit

Infrastructuur
THIS ENERGY TRANSITION IS A HUGE CHALLENGE FOR ROTTERDAM BUT IT’S ALSO AN OPPORTUNITY

Environment & sustainability:
- CO2 emissions in Rotterdam and at the port are more than 34,000 Ktonnes (an increase compared to 2013)
Economy and labour market:
- 27% of Rotterdam citizens are highly qualified. This percentage is lower than in the G4, but is on the increase
- Unemployment is 7.3% (Q3 2017). This is higher than in the G4 and the rest of the Netherlands
- Shortages on the labour market are the greatest in professions requiring university or higher professional education
- Rotterdam population expected to reach 690,000 by 2035

Opportunities
- The Energy Transition may have a flywheel effect in renovating city districts, promoting a healthy living environment, making Rotterdam an attractive business location for new enterprises, and renewing our economy
- We must make our city districts natural gas-free; our homes and the Port of Rotterdam must become sustainable and residual materials must be recycled
- Work to be done on this can be carried out by the people of Rotterdam and the Rotterdam business sector. This refers to excavation workers, demolishers, planners, electricians, plumbers, installers, IT experts, etc.
- Students in senior secondary vocational education and training, in higher professional education and at university can train Rotterdam citizens - employed or unemployed, qualified or non-qualified - so that they are ready to fill the new job vacancies created as a result of the transition and facilitating of the new economy.
ROLE OF THE MUNICIPALITY

- Controlling a totally new energy system
- Clean, reliable, affordable
- Condition for a (new) economy and an attractive city
- Keeping the procedure and impact under control
### BUSINESS/WORK/TRAINING/INNOVATION

<table>
<thead>
<tr>
<th>Domein</th>
<th>Trends</th>
<th>Initiatieven</th>
<th>Investering (2020)</th>
<th>CO2 (2020)</th>
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<tbody>
<tr>
<td>Mobiliteit</td>
<td>• Personenvervoer: Elektrisch, Waterstof, Groen gas</td>
<td>• Milieuzone, sloopregeling</td>
<td>€790 miljoen</td>
<td>2 Mton (2015)</td>
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<td>• Goederenvervoer: Waterstof, Groen gas, Biobrandstof</td>
<td>• Elektrificatie eigen vervoer + OV</td>
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<td>1,85 Mton (2030)</td>
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<td>• Mobility as a Service</td>
<td>• Laoinfra uitbreiden</td>
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<td>• Green Deal 010 ZES</td>
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<td>• City Deal Elektrische Deelmobiliteit</td>
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<td>• Waterstof, LNG, ...</td>
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<td>Gebouwde Omgeving</td>
<td>• Aardgasvrij</td>
<td>• Green Deal Aardgasvrije wijken (Pendrecht, Reyersdijk, Rozenburg)</td>
<td>€2050 – 2150 miljoen</td>
<td>2.5 Mton (2015)</td>
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<td>• Elektriciteit (warmtepompen)</td>
<td>• Warmtelevering Leidshe regio</td>
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<td>• Next Generation woonwijken</td>
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<td>Energie Infrastructure</td>
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<td>• Rotterdam Innovation Airport</td>
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<td>• Verbinding tussen overige domeinen</td>
<td>• Hart van Zuid</td>
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<td>• Conversie en opslag zijn fysieke koppelpunten</td>
<td>• IABR Aterlier Rotterdam</td>
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<td>• Consument ook producent</td>
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<td>€1500 - €3000</td>
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<td>• Meer decentraal</td>
<td>• SMC</td>
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<td>• Flexibel</td>
<td>• Warmterotonde</td>
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<td>Haven &amp; Industrie</td>
<td>• Levering van warmte aan stad</td>
<td>• Slim E-net Rotterdam-West</td>
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<td>• Mogelijk ook biomassa en H2</td>
<td>• SEG</td>
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<td>€580 miljoen (wind)</td>
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<td>• CCS &amp; CCU belangrijk gedurende transitie</td>
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<td>8 Mton (2015)</td>
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<td></td>
<td>• Kansrijke startups: energieconsumptie en opslag</td>
<td>• Warmterotonde</td>
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<td>5,8 Mton (2030)</td>
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<td>• Vondelingenwarmte</td>
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<td>• Waste-2-chemicals</td>
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<td>• Havenwind 195MW</td>
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<td>• Waterstofproductie</td>
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<td>• CCS CO2-Smart Grid</td>
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<td>• DDP Power-2-gas</td>
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IMPORTANCE OF EDUCATION

• If schools, universities devote dedicated attention to the business sector, this will obviously generate added value to new economy

• For up-to-date education, it is important for the majority of lecturers to have a commercial background.

• Energy-related knowledge is important and will remain so, regardless of the energy carriers used

• New skill/competency: System-based thinking, understanding of the greater whole (broader than the base alone), combining several specialist fields and collaboration among certain fields which might speak a different language, digital skills

• The higher professional education sector will provide broader education, develop new minors and create mixed programmes (technical business administration, technical information science, mechatronics, engineering as a combination of electrical engineering and mechanical engineering) to ensure that students are more flexible.

• We notice students being very interested, but often lacking in relevant knowledge. If we want to make a difference this will have to start with a new generation of highly qualified graduates in all fields of sustainability
NEXT LEVEL EDUCATION

- Collaboration with DRIFT, EUR
- Resilient, sustainable economy
- Integration of knowledge and skills in fields of study and research
- A new generation of highly qualified graduates
- Role of University
- Creating new resilient Masters on sustainability
Sustainability
- the next level
Sustainability - the next level
Sustainability Transitions Research

how about it, EUR?

Prof. dr. Derk Loorbach
Rotterdam, 31-05-2018
Dutch Research Institute For Transitions

Academic education, research, consultancy and activism
30 employees
Founded in 2004

mission
Guiding and accelerating sustainability transitions

loorbach@drift.eur.nl  twitter: @drk75
Science for transition

- Interdisciplinary sensemaking and pattern finding
- Transparent about biases, personality, subjectivity
- Action research and transdisciplinarity
- Identifying and voicing marginalized interests
- Questioning status quo, engaging in debate and taking position

Science in transition?

- Disciplinary and ‘objective’ social sciences
- Structure of scientific revolutions (Kuhn)
- Reflexive modernization (Beck)
- Problemstructuring
- Postnormal science (Funtowicz and Ravetz)
- Fake news (Trump)
Transitions

A process of structural, non-linear systemic change in dominant cultures, structures and practices (regime) that takes place over a period of decades (Rotmans et al, 2001, Grin et al, 2010)

cultures: shared values, paradigms, discourses

structures: institutions, economic structures, physical infrastructures

practices: routines, behavior, action, lifestyles
Sustainability Transitions Research

Research perspectives

- Socio-ecological
  - Forestry
  - Fisheries
  - Agriculture
  - Biodiversity

- Socio-institutional
  - Non-linearity
  - Multi-level
  - Co-evolution
  - Emergence
  - Regimes
  - Niches
  - Health care
  - Education
  - Labor market
  - Finance

- Socio-technical
  - Energy
  - Mobility
  - Water
  - Waste

Analytical

- Governance
- Social learning
- Institutions
- Actors

- Power
- Agency
- Discourse
- Visions
- Experimentation
- Learning

- Experimental
  - Transition arenas
  - Niche experiments
  - Action research
  - Scenarios

Governance approaches

- Social innovation
- Experiments
- Programs
- Monitoring
Transition arenas:

space for experimental governance

Regular policy arena
- short term
- mainstream
- incremental improvement
- problemsolving

Transitie Arena
- long term
- change agents
- transition
- problemsearching
NIEUWE WEGEN INSLAAN
Sustainable Design Lab
## Sustainable Design Lab

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<tr>
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<th>Room</th>
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<td>1</td>
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Sustainability - the next level
Sustainability – do you care?