

Conference  
**Sustainability -  
the next level**

31 May 2018

Erasmus University Rotterdam

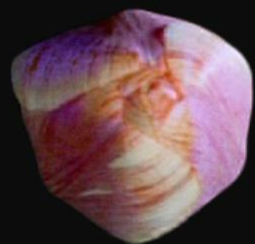


# Sustainability

- the







De  
Librije





**“SPRANKELEND IN HET GLAS,  
LOEPZUIVER EN ZEER VERFIJND”**

Erik van Loo

Parkheuvel  
\*\* Michelin Restaurant





MADE FROM  
100%  
TULIP BULBS  
CRAFTED  
BY HAND  
BOTTLED IN  
145

CLUSIUS  
CRAFT DISTILLERS

DUTCH  
*Tulip*  
VODKA

MADE FROM  
100%  
TULIP BULBS  
CRAFTED  
BY HAND  
BOTTLED IN  
75

CLUSIUS  
CRAFT DISTILLERS

DUTCH  
*Tulip*  
VODKA

# Sustainability

## - the next level





**Janrotmans**

# Education in Transition: what does it mean to EUR?

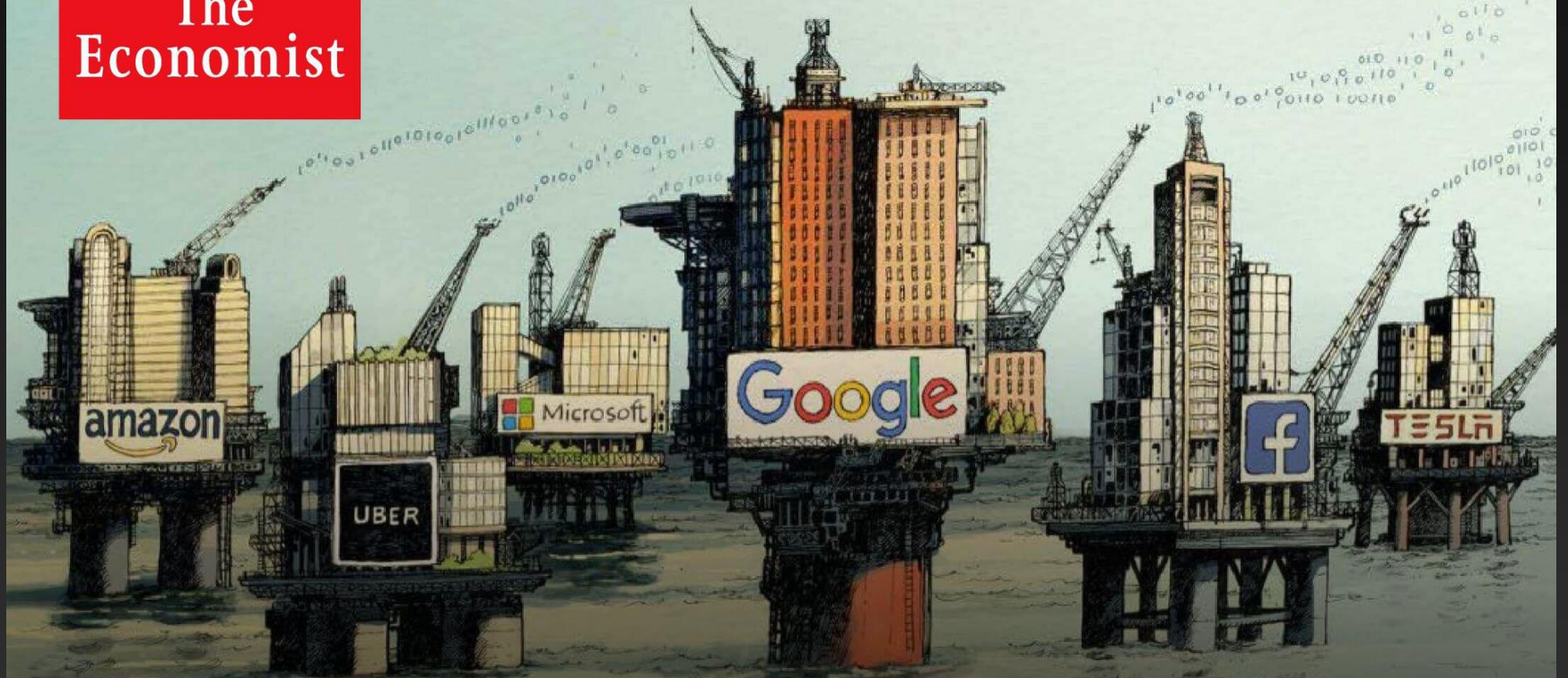
Rotterdam, 31 May 2018

 [twitter.com/janrotmans](https://twitter.com/janrotmans)

**We do not live in an era of change  
but in a change of era**



# The Economist



**The world's most valuable resource**

## 19<sup>th</sup> CENTURY

- Industrial revolution
- Fear for machines
- Long-lasting turbulence
- Social inequality
- Marx



## 21<sup>st</sup> CENTURY

- Digital revolution
- Fear for robots
- Increasing turbulence
- Social inequality
- Piketty

# Great Transition

societal transition

economic transition

ecological transition



# New Economy

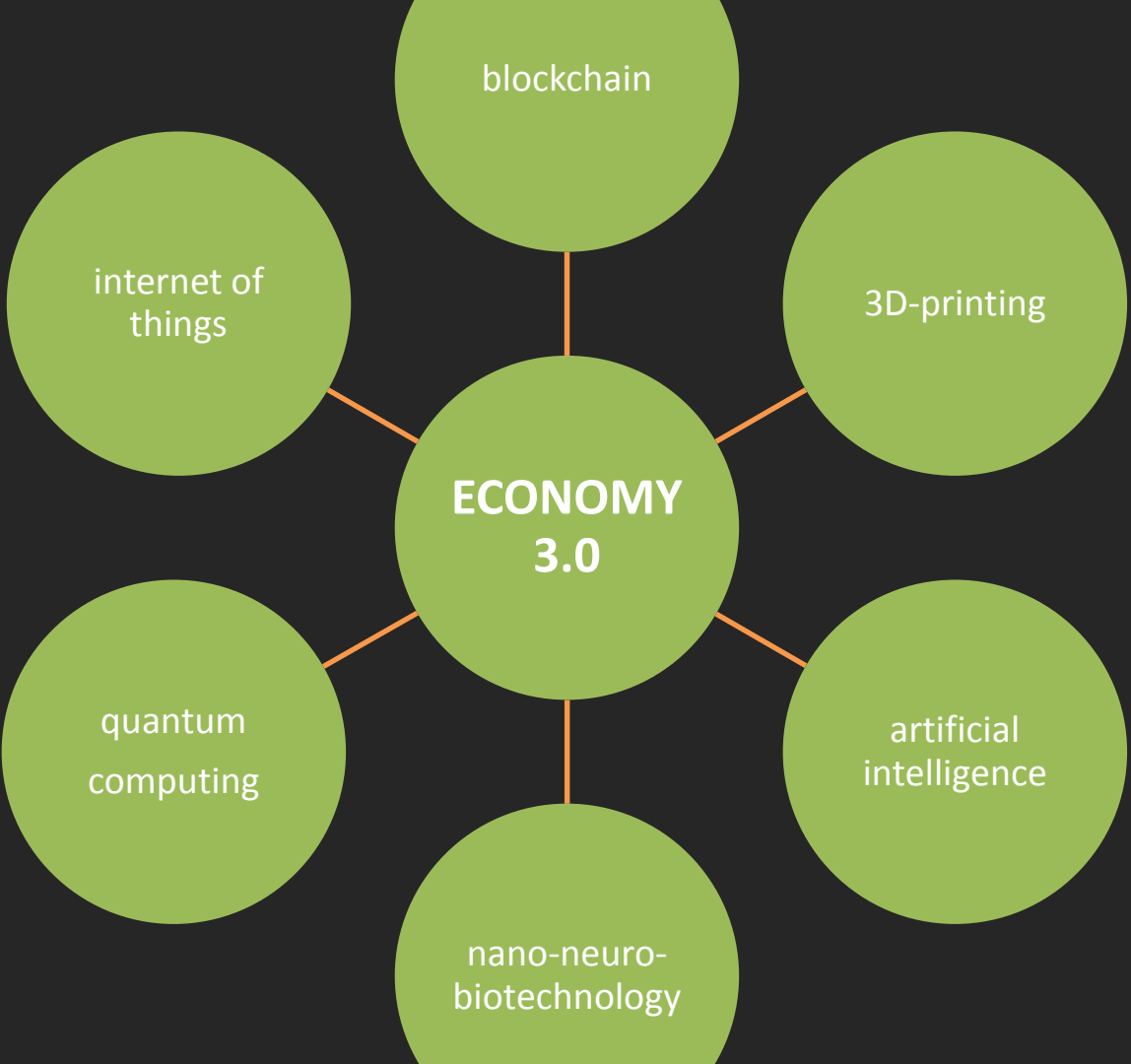
digital

decentralized

distributed

sustainable

circular



# New Society

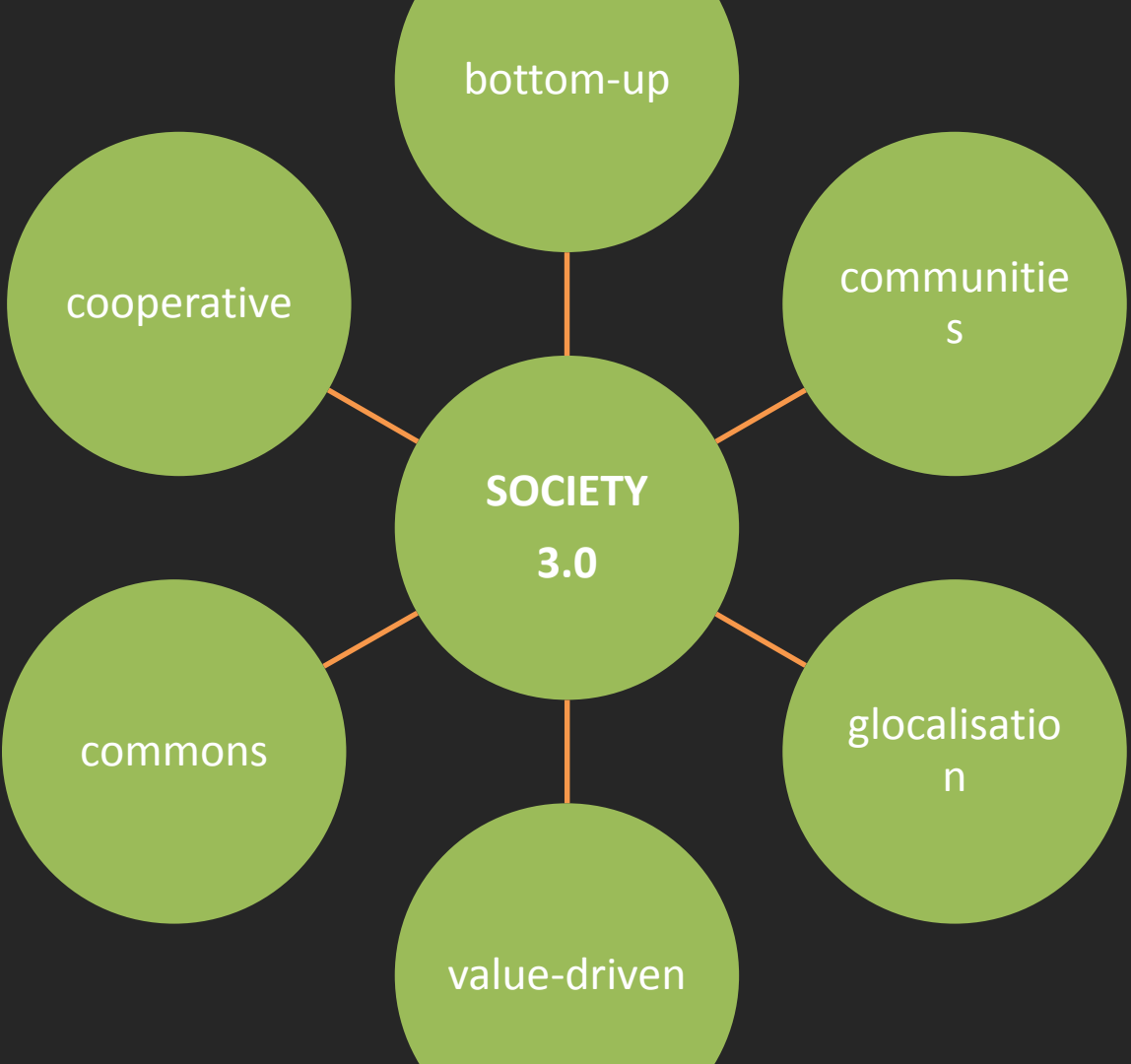
cooperative

community-based

personalised

fluid

value-driven



# Anthropocene

era in which humans influence the Earth system

has profound consequences for humans

climate change

plastic soup

extinction of insects

# New Heat Record Antartics: 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

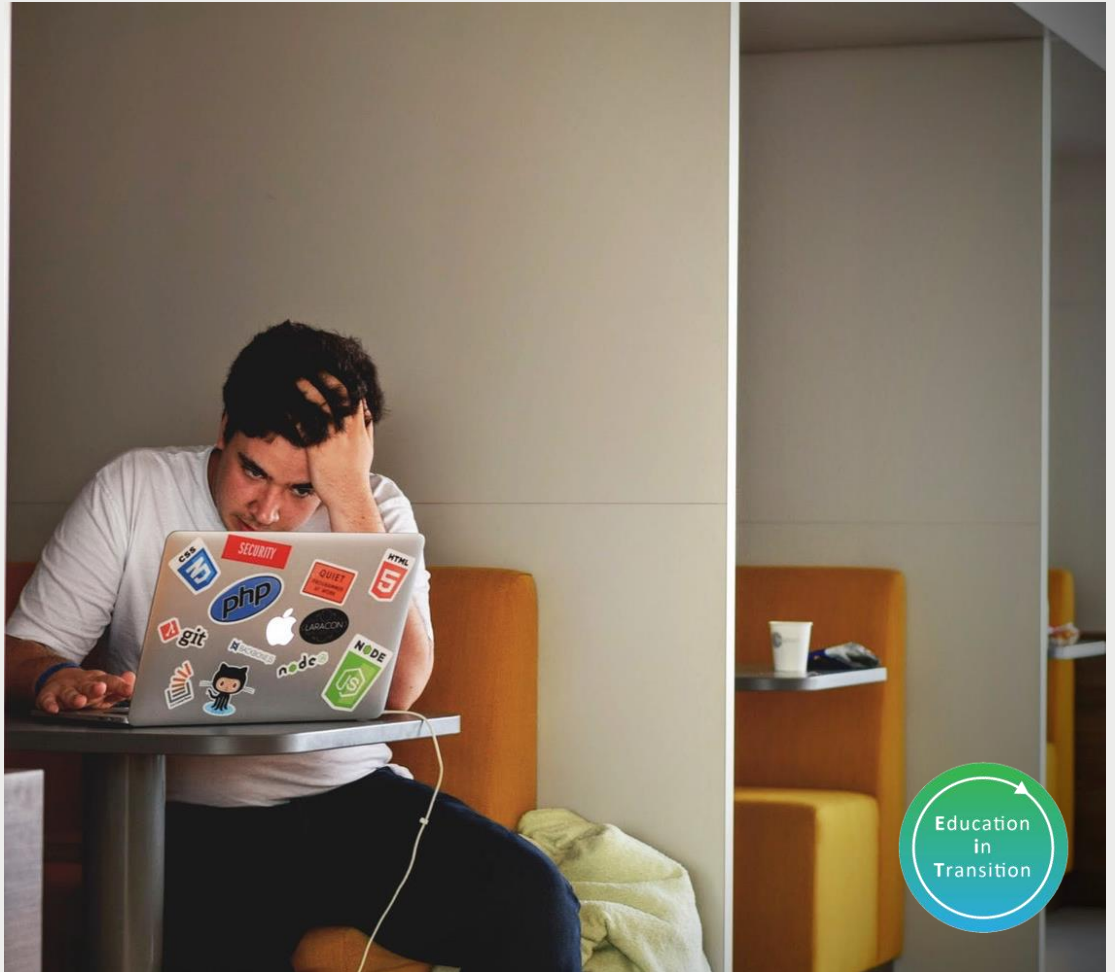
integral plan for the next 10 years

sustainability in all bachelor programmes

variety of sustainability master programmes

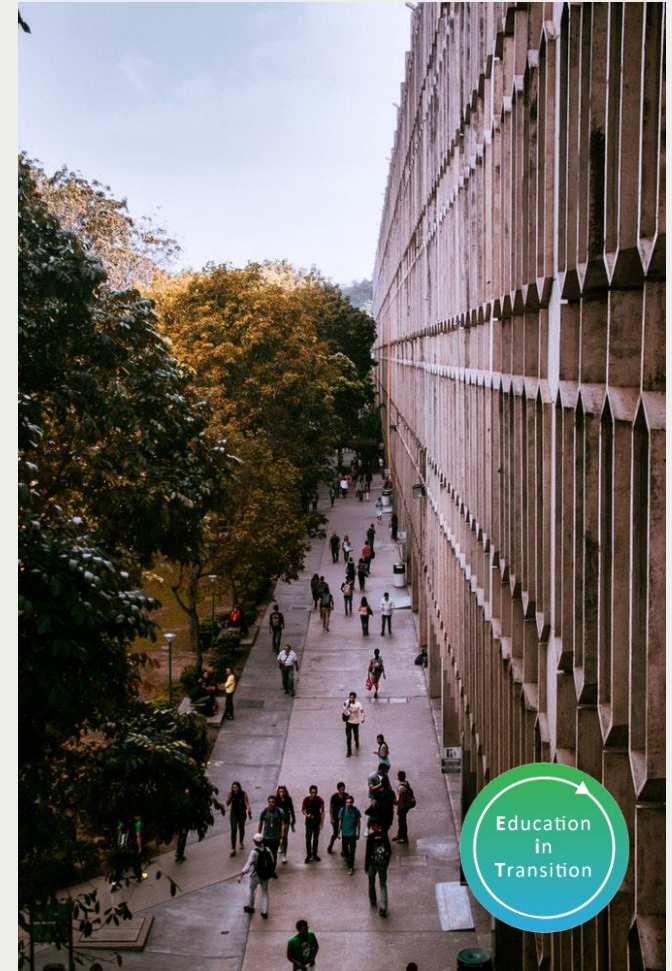
transition thinking should be part of it

**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**

Education  
in  
Transition

# 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



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# SUSTAINABLE ROTTERDAM

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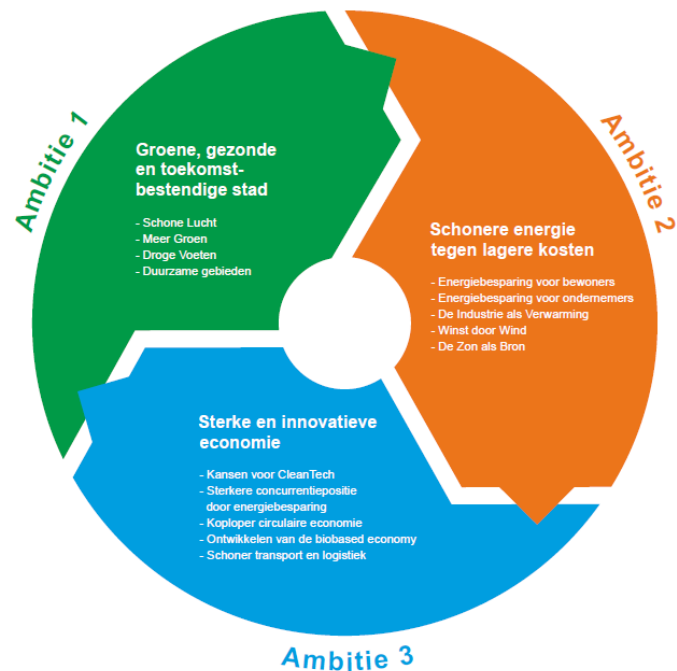


Asmae Belhirsch  
Sustainable Programme Manager

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# SUSTAINABLE PROGRAMME 2015-2018 “CLOSER TO THE PEOPLE OF ROTTERDAM”

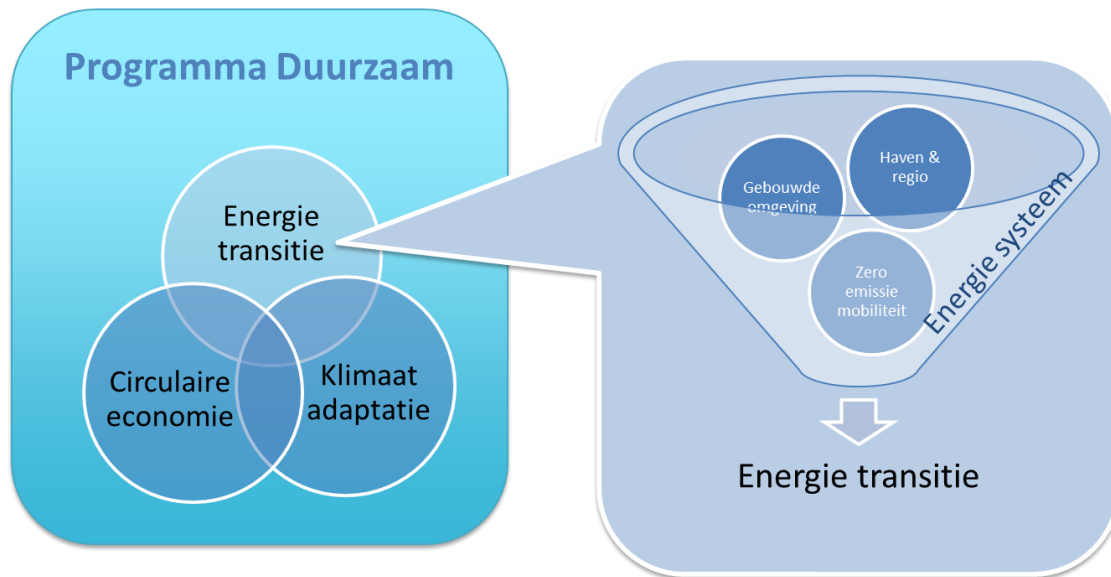
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# CONTEXT & SCOPE

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# (INTER)NATIONAL CONTEXT

## 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 ENERGY STRATEGY

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

## ROTTERDAM AKKOORD,

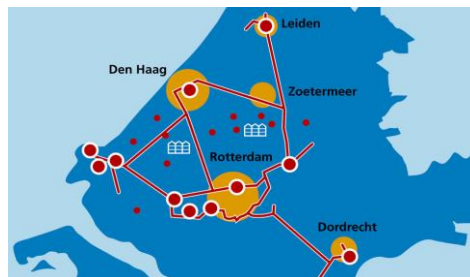
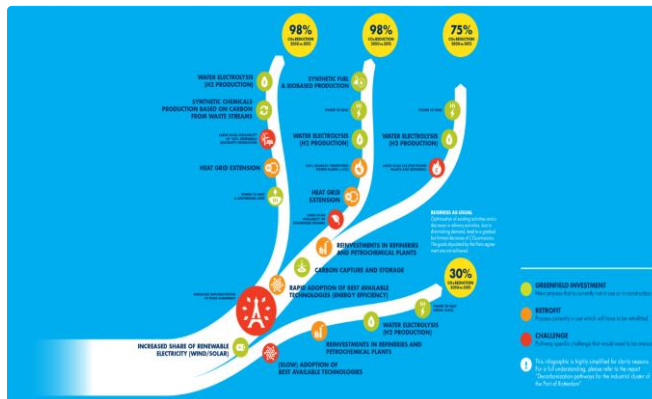
## ROTTERDAMS CLIMATE AGREEMENT

## NEW COALITION PROGRAMME

- Objective, transition pathways, lines of action, measures
- Complying with national guidelines

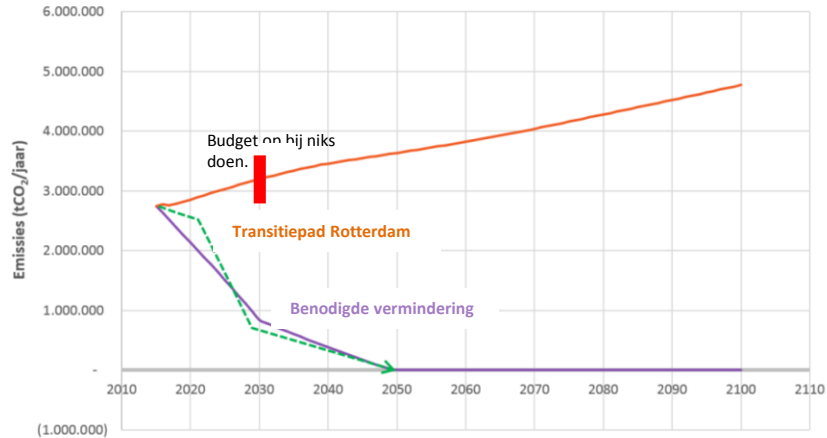
# PORT AND CITY

10% van de uitstoot is “stedelijk”  
90% is “haven industrieel complex”



# THIS IS THE ENERGYTRANSITION FOR ROTTERDAM

## What are we aiming for?



**Rotterdams stedelijk “budget” vanuit Parijs: 36,4 megaton CO<sub>2</sub>**

(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

Auteurs  
**Roel van Raak**  
**Charlie Spork**  
**Sophie Buchel**  
**Derk Loorbach**

met bijdragen van  
**Frank van Steenberg**  
**Kevin Vervuurt (ARUP)**

**drift** for transition



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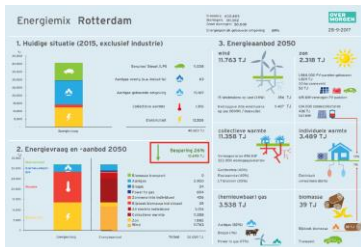
# RECOMMENDATIONS FROM DRIFT & ROYAL HASKONING

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- **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

## Energie mix / Bronnenstrategie



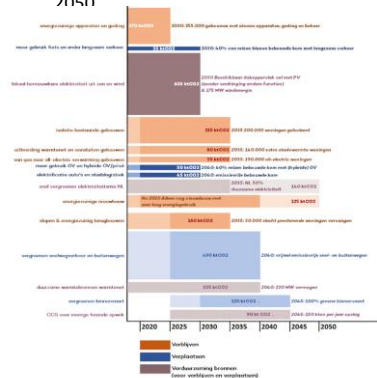
## Woningen/VG Aardgasvrij / CO2-arm

| Woningtype                        | 2050    | 2030   | 2021   |
|-----------------------------------|---------|--------|--------|
| Woningen van het gas              | 263.000 | 95.000 | 4.000  |
| Luchtwarmte woningen              | 18.000  | 6.000  | 1.000  |
| Woningen op HVG-waarde            | 78.000  | 31.400 | 33.000 |
| Woningen met HVG (1.000 tot 1000) | 8.000   | 1.200  | 300    |
| Overeenkomstig wettelijk          | 300     | 120    | 30     |
| Overeenkomstig                    | 870     | 220    | 70     |
| Overeenkomstig                    | 800     | 230    | 70     |

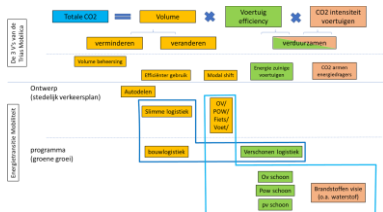
FINANCIER  
NG



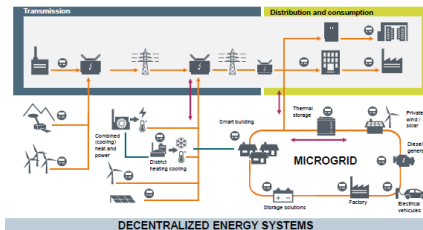
## CO2 Reductiemaatregelen tot 2050



## Duurzame Mobiliteit



## Infrastructuur



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# THE ENERGY TRANSITION

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**CLIMATE CHANGE**

**ECONOMIC SITUATION**

**RESIDENTS' SITUATION/SOCIALE CHALLENGE**

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# THIS ENERGY TRANSITION IS A HUGE CHALLENGE FOR ROTTERDAM BUT IT'S ALSO AN OPPORTUNITY

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## 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.

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# ROLE OF THE MUNICIPALITY

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- 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

De energietransitie gaat in Nederland tot 2050 circa 200 miljard euro kosten. Overhaaste, ondoordachte verboden en geboden die hun doel missen maar wel de burger hard raken, zullen het draagvlak daarvoor op voorhand aantasten.

# BUSINESS/WORK/TRAINING/INNOVATION

| Domein                                                                                                                 | Trends                                                                                                                                                                                                                                                             | Initiatieven                                                                                                                                                                                                                                                                                                            | Investering (2030)                                                     | CO2 (2030)                                                                                |
|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
|  <p><b>Mobiliteit</b></p>             | <ul style="list-style-type: none"> <li>Personenvervoer: Elektrisch, Waterstof, Groen gas</li> <li>Goederenvervoer: Waterstof, Groen gas, Biobrandstof</li> <li>Mobility as a Service</li> </ul>                                                                    | <ul style="list-style-type: none"> <li>Milieuzone, sloopregeling</li> <li>Elektrificatie eigen vervoer + OV</li> <li>Laadinfra uitbreiden</li> <li>Green Deal 010 ZES</li> <li>Living Labs Smart Charging</li> <li>City Deal Elektrische Deelmobiliteit</li> </ul>                                                      | <ul style="list-style-type: none"> <li>€790 miljoen</li> </ul>         | <ul style="list-style-type: none"> <li>2 Mton (2015)</li> <li>1,85 Mton (2030)</li> </ul> |
|  <p><b>Gebouwde Omgeving</b></p>      | <ul style="list-style-type: none"> <li>Aardgasvrij</li> <li>Elektriciteit (warmtepompen)</li> <li>Warmte (warmtenetten)</li> </ul>                                                                                                                                 | <ul style="list-style-type: none"> <li>Waterstof, LNG, ...</li> <li>Green Deal Aardgasvrije wijken (Pendrecht, Reyersdijk, Rozenburg)</li> <li>Warmtelevering Leidse regio</li> <li>Next Generation woonwijken</li> <li>Rotterdam Innovation Airport</li> <li>Hart van Zuid</li> <li>IABR Aterlier Rotterdam</li> </ul> | <ul style="list-style-type: none"> <li>€2050 - 2150 miljoen</li> </ul> | <ul style="list-style-type: none"> <li>2,5 Mton (2015)</li> <li>2 Mton (2030)</li> </ul>  |
|  <p><b>Energie Infrastructuur</b></p> | <ul style="list-style-type: none"> <li>Verbinding tussen vraag en aanbod</li> <li>Verbinding tussen overige domeinen</li> <li>Conversie en opslag zijn fysieke koppelpunten</li> <li>Consument ook producent</li> <li>Meer decentraal</li> <li>Flexibel</li> </ul> | <ul style="list-style-type: none"> <li>SEG</li> <li>SMCG</li> <li>Warmterotonde</li> <li>Slim E-net Rotterdam-West</li> </ul>                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>€1500 - €3000</li> </ul>        | <ul style="list-style-type: none"> <li>P.m.</li> </ul>                                    |
|  <p><b>Haven &amp; Industrie</b></p> | <ul style="list-style-type: none"> <li>Levering van warmte aan stad</li> <li>Mogelijk ook biomassa en H2</li> <li>CCS &amp; CCU belangrijk gedurende transitie</li> <li>Kansrijke startups: energieconsumptie en opslag</li> </ul>                                 | <ul style="list-style-type: none"> <li>Warmterotonde</li> <li>Vondelingenwarmte</li> <li>Waste-2-chemicals</li> <li>Havenwind 195MW</li> <li>Waterstofproductie</li> <li>CCS CO2-Smart Grid</li> <li>DDP Power-2-gas</li> <li>DDP Power-2-Hydrogen</li> </ul>                                                           | <ul style="list-style-type: none"> <li>€580 miljoen (wind)</li> </ul>  | <ul style="list-style-type: none"> <li>8 Mton (2015)</li> <li>5,8 Mton (2030)</li> </ul>  |



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# IMPORTANCE OF EDUCATION

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- 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



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# NEXT LEVEL EDUCATION

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- **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





*Erasmus*











# Sustainability

## - the next level



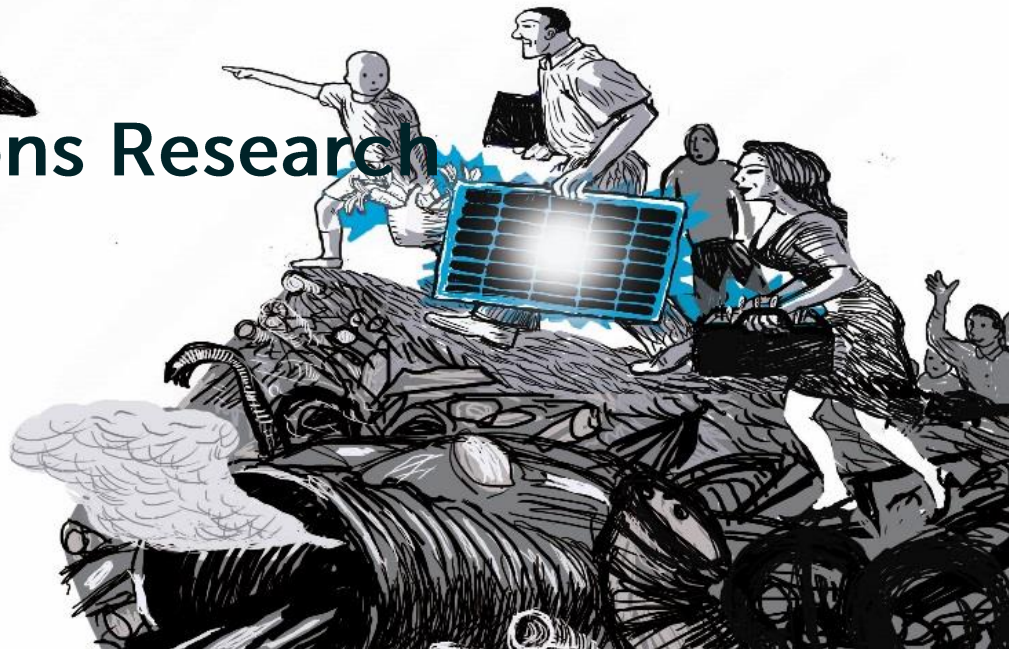




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# Sustainability Transitions Research

*how about it, EUR?*



Prof. dr. Derk Loorbach  
Rotterdam, 31-05-2018

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## Dutch Research Institute For Transitions

Academic education,  
research, consultancy and  
activism

30 employees

Founded in 2004

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### missio

Guiding and accelerating  
sustainability transitions



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

## Science in transition?

*Erasmus*

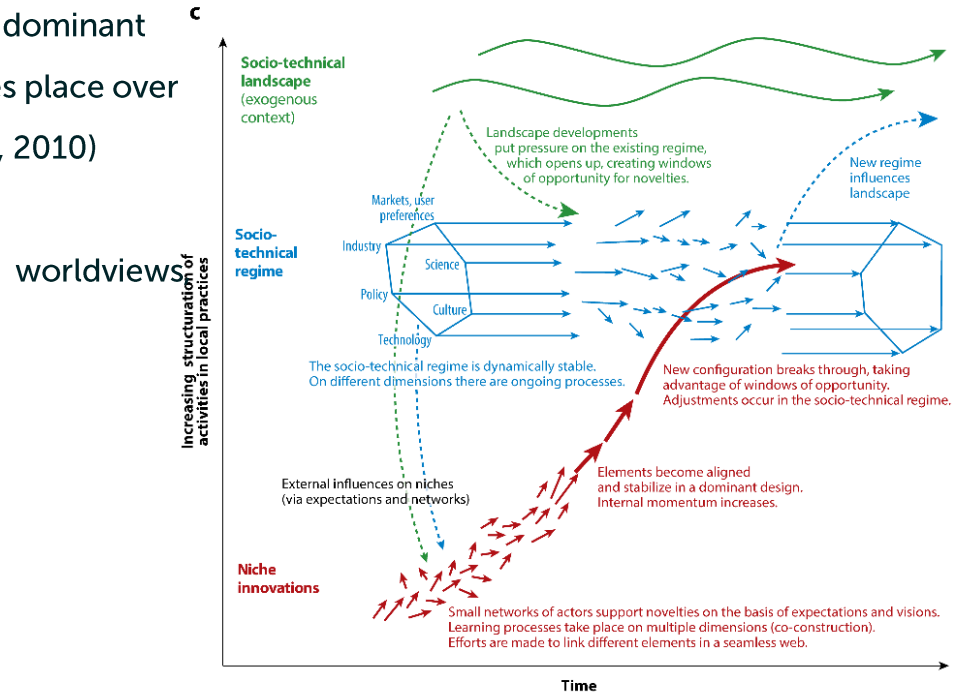
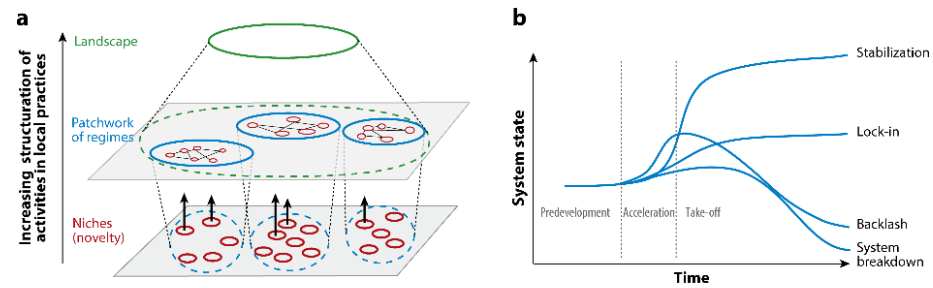
# Transitions

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)

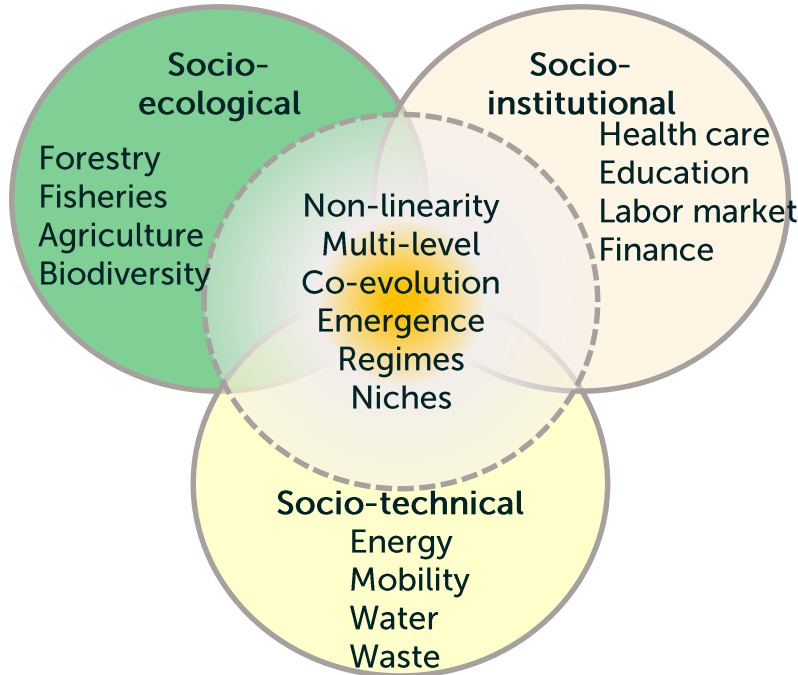
**cultures:** shared values, paradigms, discourses

**structures:** institutions, economic structures, physical infrastructures

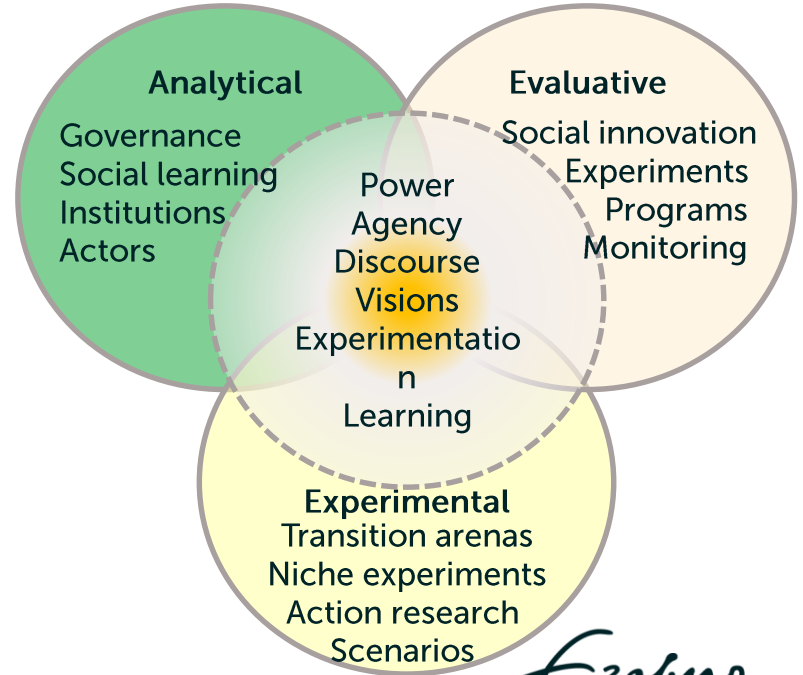
**practices:** routines, behavior, action, lifestyles



# Sustainability Transitions Research



Research perspectives

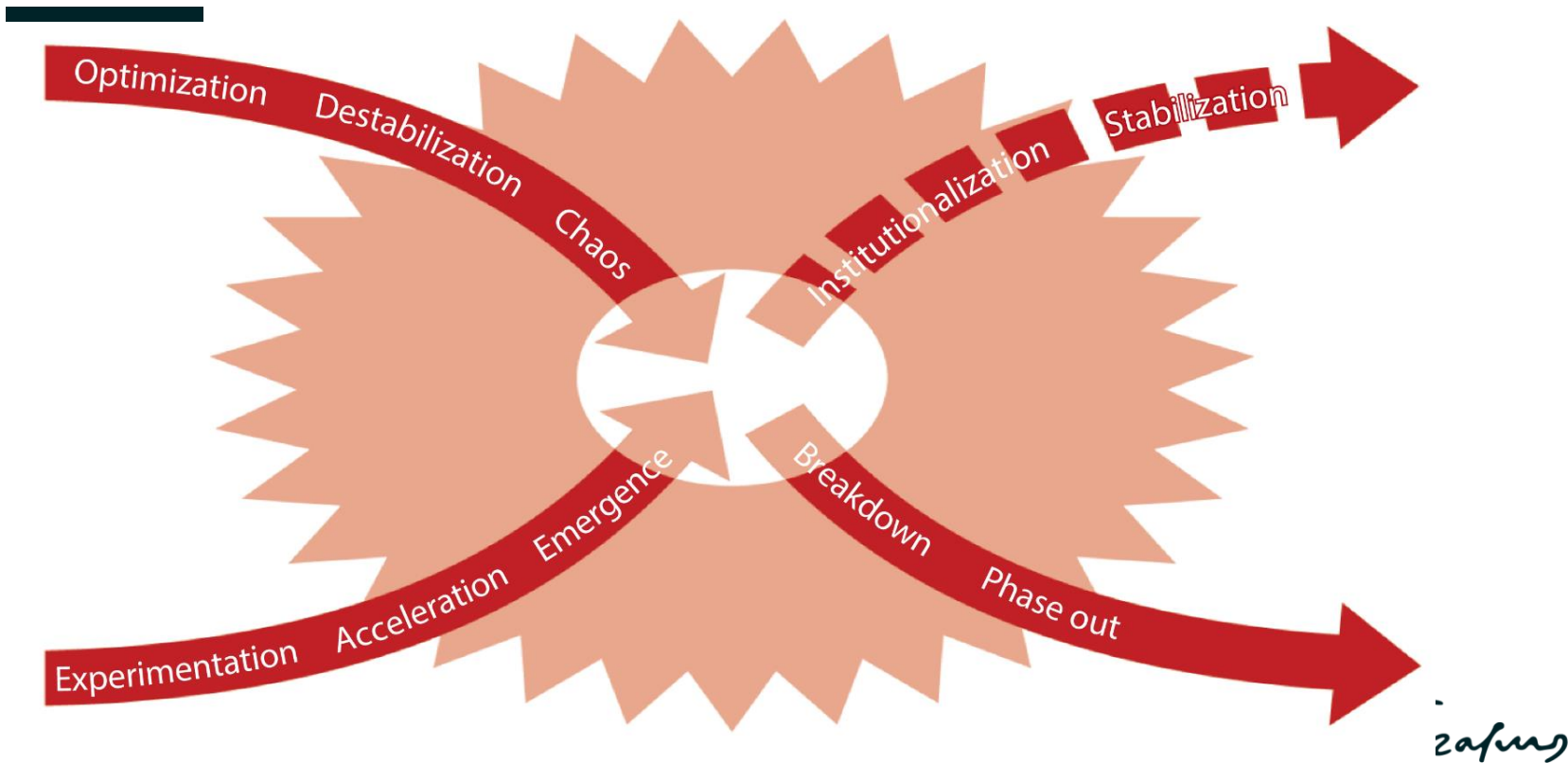


Governance approaches *Ezafus*

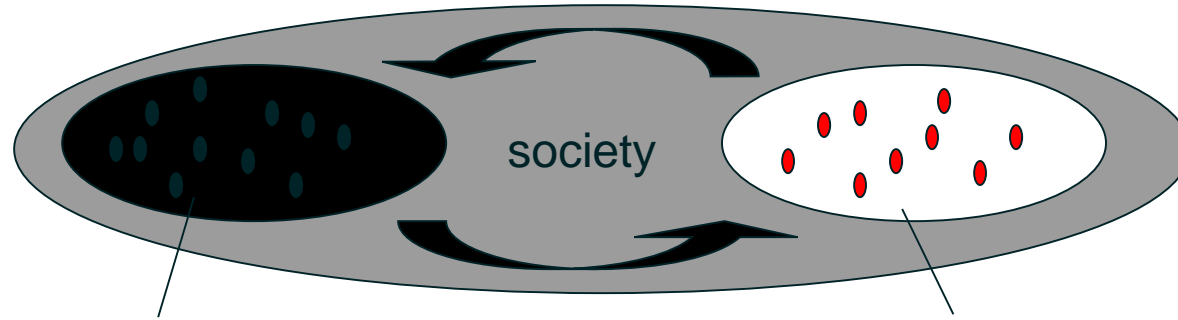




*Erasmus*



# Transition arenas: *space for experimental governance*



## Regular policy arena

- *short term*
- *mainstream*
- *incremental improvement*
- *problemsolving*

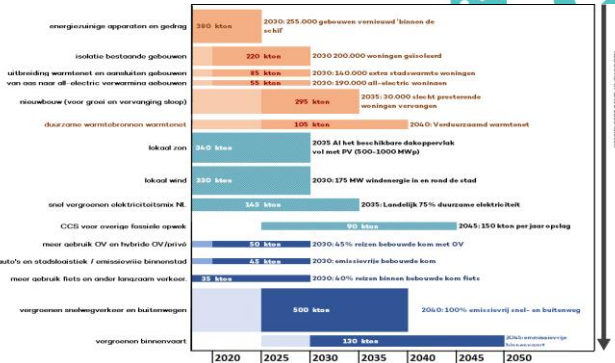
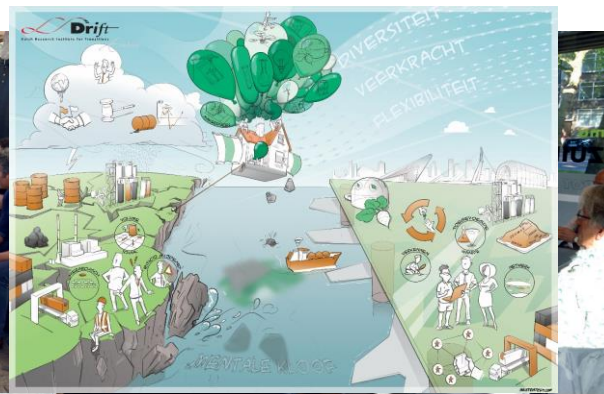
## Transitie Arena

- *long term*
- *change agents*
- *transition*
- *problemsearching*





## NIEUWE WEGEN INSLAAN



Welkom!

Stem op ons voor de 'Meer dan handen' prijs!

Beeldmerk

TO'S  
Rivierland  
WILHELMUS  
MEER  
DOCK

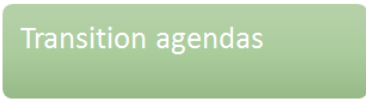
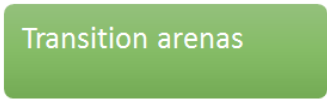
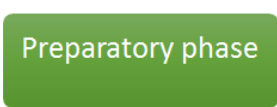
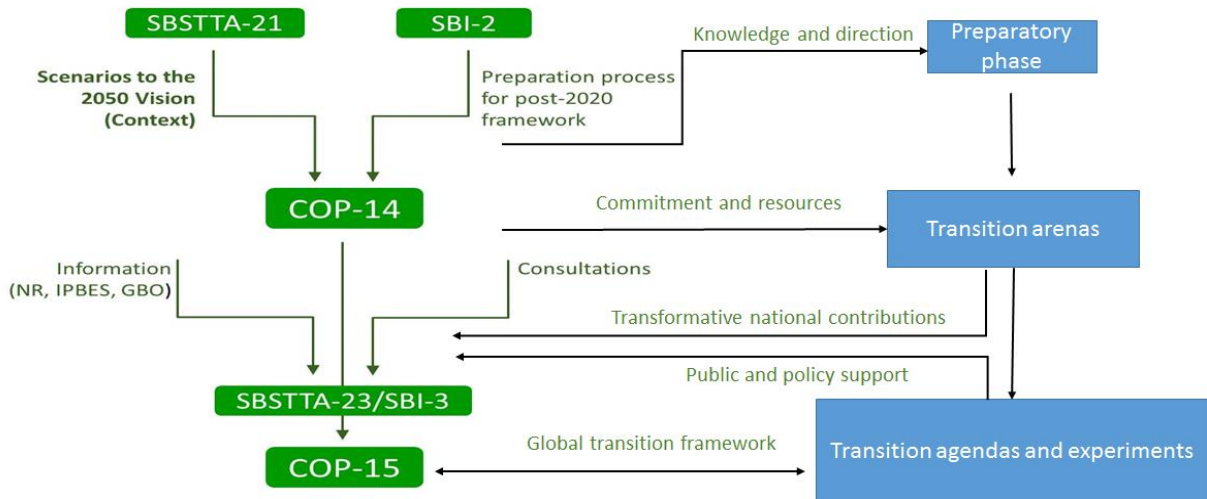
HEER  
KAROLUS

FIETSEN  
OP ZUID

Erasmus

# Global

# National

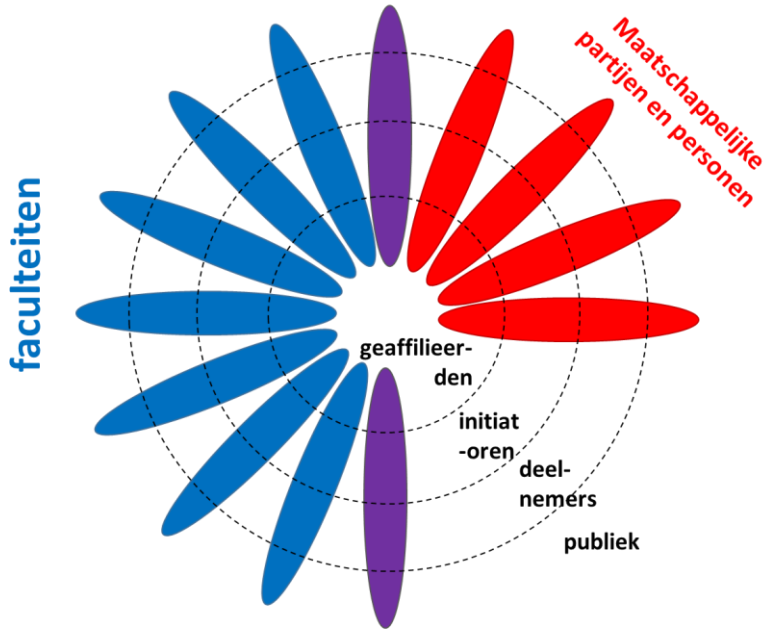


- Creating transition team
- Mapping transition dynamics
- Identifying sectors and potentials
- Selecting frontrunners
- Developing process design

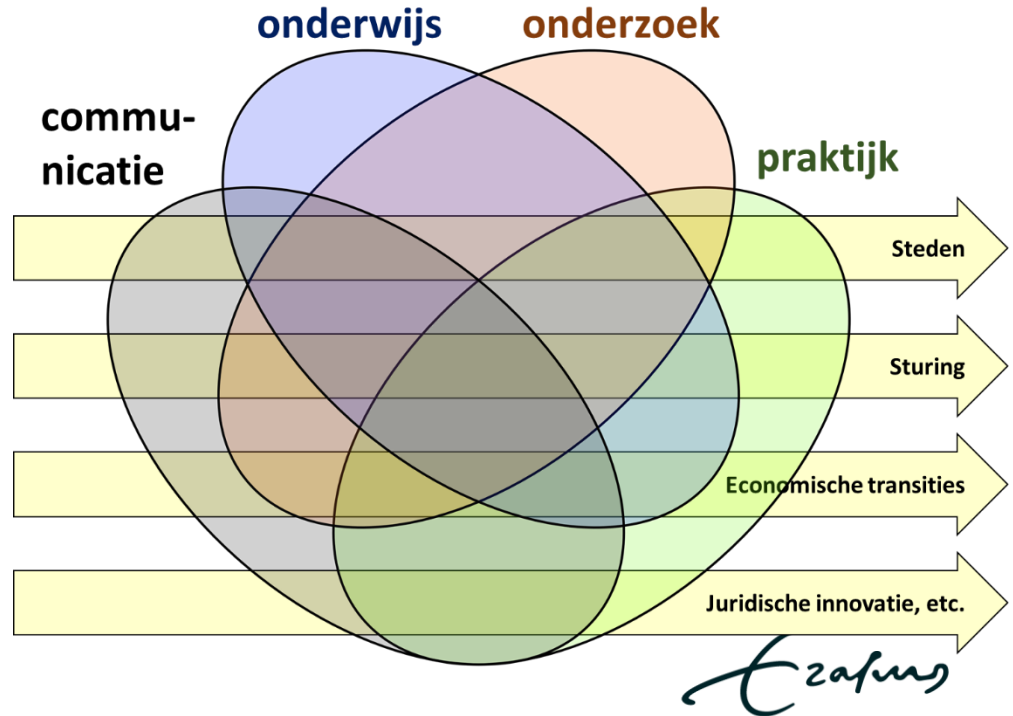
- Problem structuring and framing
- Envisioning and backcasting
- Transition coalitions and experiments
- Adopting transition agendas

- Implementation and resourcing
- Institutionalisation and embedding
- Communication and diffusion
- Monitoring and learning

# Platform for Transition

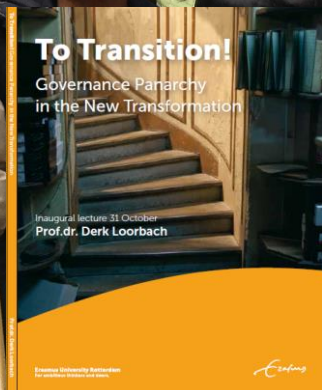


Bestaande buitenfacultaire en  
Grensstructuren (BV's, SG, sustainability hub  
Smart ports, samenwerkingen stad, etc. etc.)





drift for transition



for more information and publications:

[loorbach@drift.eur.nl](mailto:loorbach@drift.eur.nl)

[www.drift.eur.nl](http://www.drift.eur.nl)

[www.twitter.com/drk75](https://www.twitter.com/drk75)

Erasmus

# Sustainable Design Lab

Erasmus University Rotterdam



*Erasmus*

# Sustainable Design Lab

| Table | Room       |
|-------|------------|
| 1     | Restaurant |
| 2     | Restaurant |
| 3     | Restaurant |
| 4     | Restaurant |
| 5     | Aberdeen   |
| 6     | Aberdeen   |
| 7     | Auckland   |
| 8     | Auckland   |
| 9     | Praag      |
| 10    | Praag      |

The Erasmus logo is a stylized, handwritten-style signature of the name "Erasmus" in black ink, located in the bottom right corner of the slide.

# Sustainability

## - the next level



**Sustainability –  
do you care?**



*Erasmus*