The Economic Value of Cycling

ECF studies about socio-economic benefits

COMPROMISSO PELA BICICLETA

UNIVERSITY AVEIRO COLLABORATIONS
Wednesday, 19 April 2017 – Porto

Manfred Neun
ECF/WCA President
Chair of the S4C advisory board

Scientists for cycling

ECF
EUROPEAN CYCLISTS' FEDERATION

ECF gratefully acknowledges financial support from the European Commission.

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the economic value of cycling – content

universidade de aveiro

TRB

1. Structured overview of cycling economics
   - About cycling economy
   - Overview on cycling related research
   - About cycling economy + economics
2. Research on socioEconomic benefits of cycling
   - Current economic research on health-benefits, congestion costs, external costs, shopping benefits, road safety, e-mobility, cargo, jobs, taxes, tourism, …
   - The UITP GHSCS study
   - Cycling contributions to SDGs and further perspectives on cycling economic benefits
3. The "EU cycling economy" study
   - The Active Mobility Agenda evaluation
   - Results on jobs and green growth
   - The EU cycling strategy, also for Portugal?
4. Perspectives on cycling economics
   - e-cycling, e-mobility [market excursus]
   - "smarter cycling" + AM hybrid scenario
   - integrated cycling, ITS + fusion
5. Conclusion & Invitations

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1.1 about cycling economy – the momentum created

Key-note speakers Gro Harlem Brundtland ("Cycling and Sustainability") and Manfred Neun ("Cycling Economy") at the opening plenary of Velo-city 2011 Seville, March 28.

… in general:

- It was the Stern review (2006) that changed the political relevance of the climate change on the global political agenda.
- The fact: economics is the science that underpins modern politics, and …

… for cycling:

- … since the global financial crisis (2007 – 09) there is a political demand for a link between cycling, employment and growth.
- I introduced the first "Cycling Economy" (2011) framework as a macro-economic approach. Since we have seen how experts and partners have responded, widening the frame for investments in cycling and bringing together all the components I highlighted.
- The "Cycling Economy II" (2013) was implementing then the human rights approach for all further (public) investments.
- This was substantial to highlight (2015) how cycling contributes to the UN Global Goals.
- And 2016, as a consequent follow up, the "EU cycling economy" results were published.

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1.2 about cycling related research

(3) Global Targets & Demand Sustainability driven

Based on UN SDGs, New Urban Agenda, precautionary principle etc.

The three clusters of this column downwards are mostly …

(2) Cycling Paradigms*

Terms, paradigms, approaches – *work in progress*!

(1) Cycling Research

Structure focused on academic research – *fast maturing field, judged by volume of outputs and global reach.*

General approaches

- Active mobility (AM)
- Human rights and global justice
- Active mobility agenda
- Framing cycling

Interdisciplinary approaches

- Cycling economics
- Cycling as a system
- Integrated Cycling as part of ITS
- Cycling Safety (-/AM)

Specific approaches

- … on SDGs / Global Goals
- … on New Urban Agenda

*On the way to *Cycling Theories*

- *Work in progress / not fixed*
- *Framing as methodology*
- *Guidelines for research*
- *For interdisciplinary collab.*

(1) (2) (3) (4)

Driving Forces and Demand for Further Cycling Research

… Engineering based:

- Transport / mobility
- ITS, mapping, …
- Infrastructure / technics
- Product design / technics
- Urban dsg / architecture
- Space planning

… Natural or philosophical sciences based:

- Ecology, environment
- Climate, global warming
- Clean air efficiency
- Health, fitness, …
- Medical / therapies, …
- Values + ethics …

… Social a/o political sciences based:

- Individual behavior, culture
- Social practices, culture
- Economy: cost-benefit, climate + resilient work, jobs, taxes, tourism, …
- Education, gender, …

(4) Increasing demand on Cycling evidence and best practice

NGOs	National politics	GOVs
CivSoc	Urban politics	Experts
a. o.	Industries	R&D

Fig. 1

Scientists for cycling

M. Neun

1.3 about cycling economy + economics

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Scientists for cycling

M. Neun

1.3 about cycling economy + economics

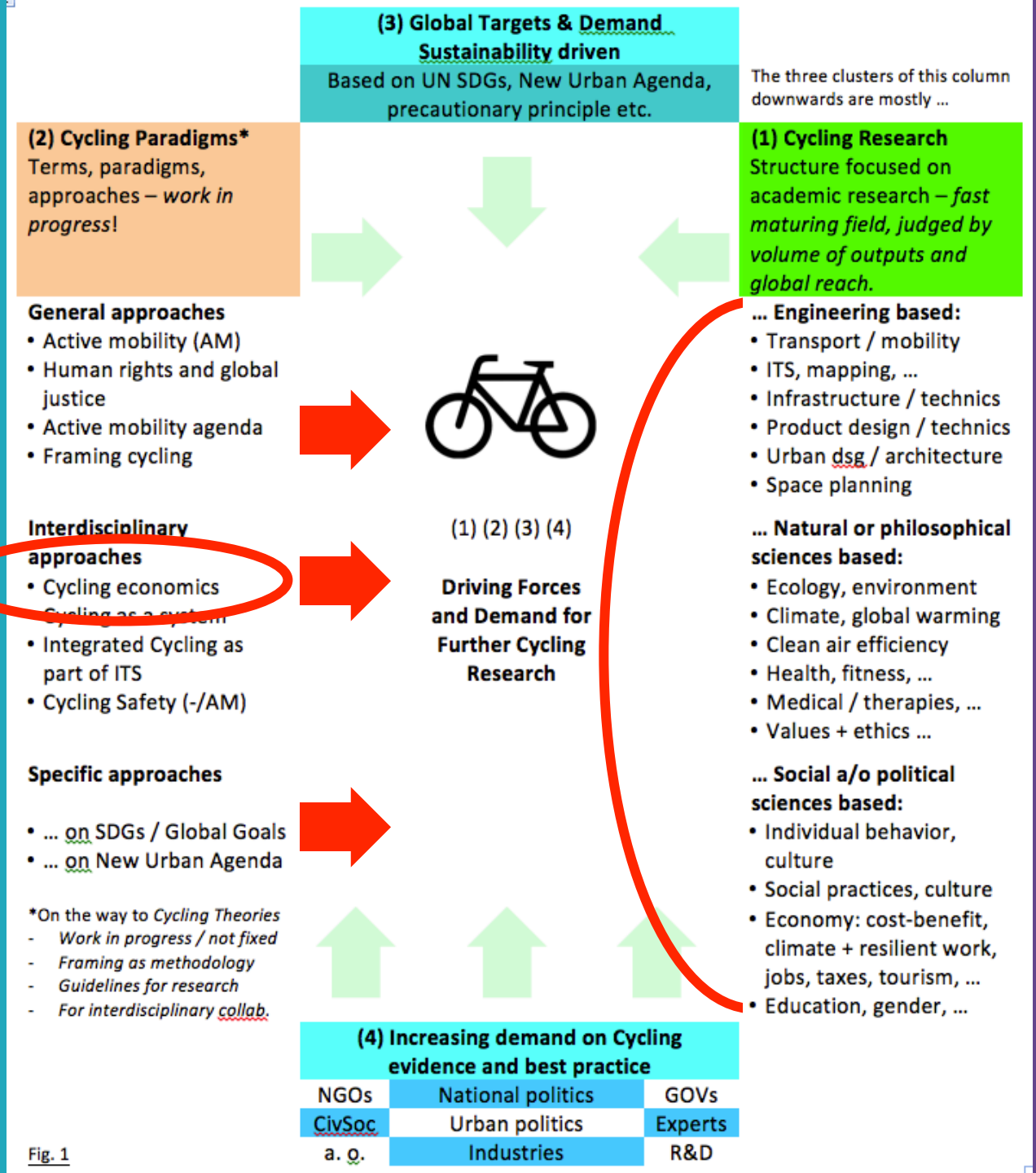

Fig. 1

Scientists for cycling

M. Neun

2. research on socio + economic benefits of cycling

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2. research on socio + economic benefits of cycling

- Qian, X. et al. 2016.

Assessing the Economic Impact and Health Effects of Bicycling in Minnesota

The Minnesota Department of Transportation has released a report estimating the economic impact of cycling as well as the health effects in the Twin Cities metropolitan area using the WHO Health Economic Assessment (HEAT) tool.

- Cavill, N. and Kahlmeier S. 2015. **Turn up the HEAT.**

Recommendations to increase the use of the World Health Organization's Health Economic Assessment Tool for Cycling across Europe. Summary Report for the European Cyclists' Federation (eds.), Brussels.

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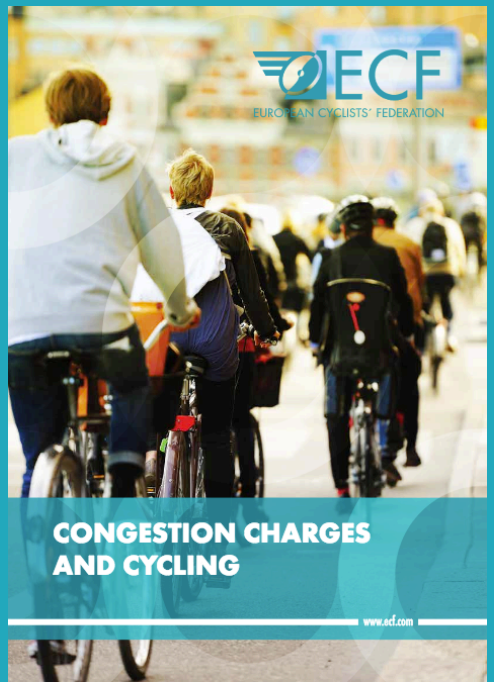
2. research on socio + economic benefits of cycling

- Andrade, V. et al. 2016.

Transporte Cicloviário … – Cycling in Brazilian cities: Motivations and challenges

This article presents the results of the first Brazilian national survey about the motivations and challenges for the use of the bicycle for urban transportation. This research was carried out through a partnership between the Sustainable Mobility Laboratory (PROURB), NGO Transport Active and the Observatory of the Metropolises.



- Haubold, H. 2016 Congestion Charges and Cycling.

Report by the European Cyclists' Federation (eds.), Brussels. Available at: https://ecf.com/groups/congestion-charges-and-cycling

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2. research on socio + economic benefits of cycling

- Delhaye, E. et al. 2017.

Internalisation of external costs of transport in Flanders

This report in Dutch (Flemish) discusses the private costs, the external costs and the level of internalization of transport in Flanders for the period 2000-2014.

[11bn]

- Haubold, H. 2016 Shopping by Bike: Best Friend of your City Centre Report by the European Cyclists' Federation (eds.), Brussels. Available at: https://ecf.com/sites/ecf.com/files/CYCLE%20N%20LOCAL%20ECONOMIES_internet.pdf

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- Education, gender, …

2. research on socio + economic benefits of cycling

- Vanparijs, J. et al. 2016.

Characteristics of bicycle crashes in an adolescent population in Flanders (Belgium).

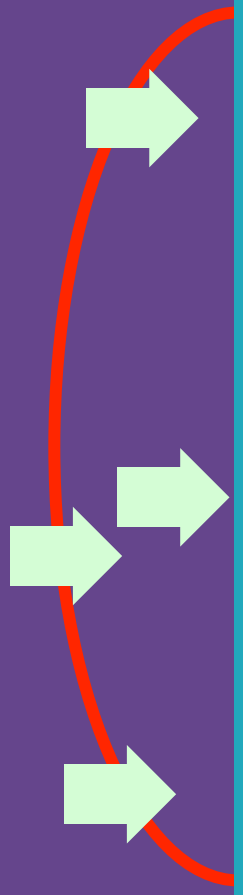
Study on cycling safety in an adolescent population, this paper analyses in depth the bicycle crash causes and characteristics in an adolescent population.

[road safety]

- Marqués, R. and Hernández-Herrador, V. 2016.

On the effect of networks of cycle-tracks on the risk of cycling. The case of Seville.

The study analyzes the evolution of the risk of cycling in Seville before and after the implementation of a network of segregated cycle tracks in the city, and specifically, we study the evolution of the risk for cyclists of being involved in a collision with a motor vehicle, using data reported by the traffic police along the period 2000-2013, i.e. seven years before and after the network was built.



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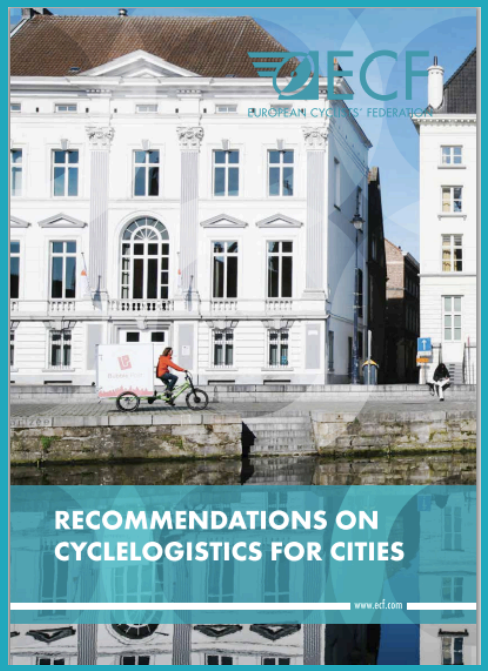

- Swennen. B. and Rzewnicki, R. 2016. **Recommendations on Cyclelogistics for Cities.** Report by the European Cyclists' Federation (eds.), Brussels. Available at: https://ecf.com/groups/recommendations-cyclelogistics-cities

Photo courtesy Eric Britton: https://www.facebook.com/photo ...

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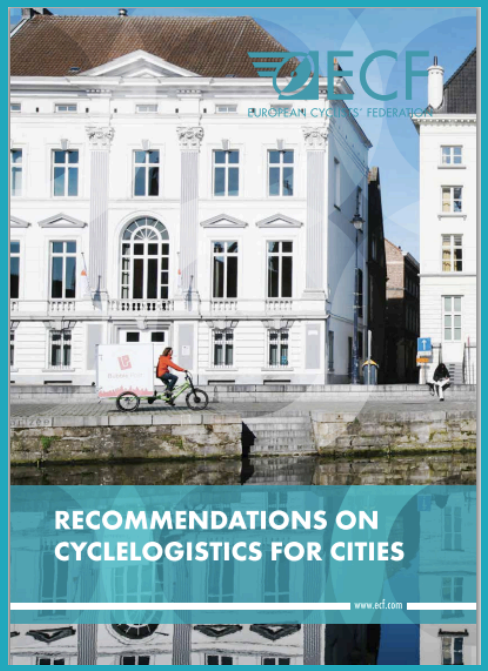

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The **City Hub** is a customized trailer which can carry up to four containers for the **DHL Cubicycle**, a customized cargo bicycle which can carry a container with a load of up to 125 kg.

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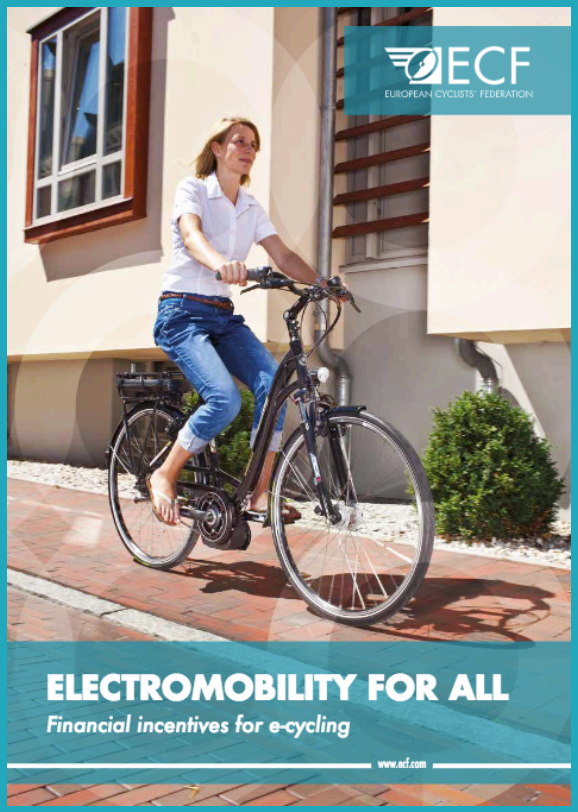

- Holger H. 2017.

Electromobility for all: Financial incentives for e-cycling

Report by the European Cyclists' Federation (eds.), Brussels. Available at: https://ecf.com/sites/ecf.com/files/FINAL%20for%20web%20170216%20ECF%20Report_E%20FOR%20ALL-%20FINANCIAL%20INCENTIVES%20FOR%20E-CYCLING.pdf

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2. research on socio + economic benefits of cycling

[market info]

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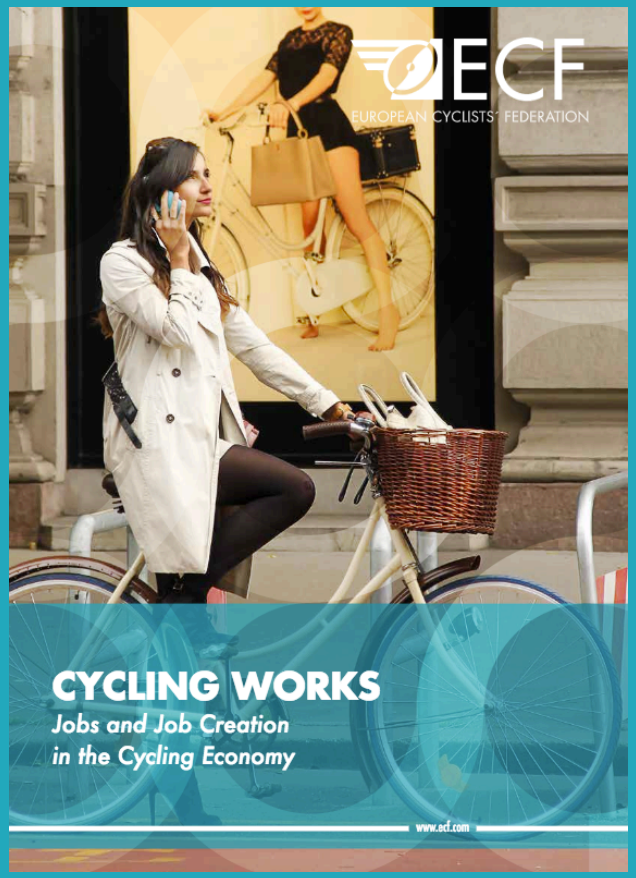

- Blondiau, T. and van Zeebroeck, B. 2014.

Cycling Works – Jobs and Job Creation in the Cycling Economy

Report for the European Cyclists' Federation (eds.), Brussels. Available at: https://ecf.com/sites/ecf.com/files/141125-Cycling-Works-Jobs-and-Job-Creation-in-the-Cycling-Economy.pdf

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2. research on socio + economic benefits of cycling

jobs

green growth

➡ [655,000jobs]

➡ [1 million jobs possible]

- Blondiau, T. and van Zeebroeck, B. 2014. **Cycling Works – Jobs and Job Creation in the Cycling Economy** Report for the European Cyclists' Federation (eds.), Brussels. Available at: https://ecf.com/sites/ecf.com/files/141125-Cycling-Works-Jobs-and-Job-Creation-in-the-Cycling-Economy.pdf

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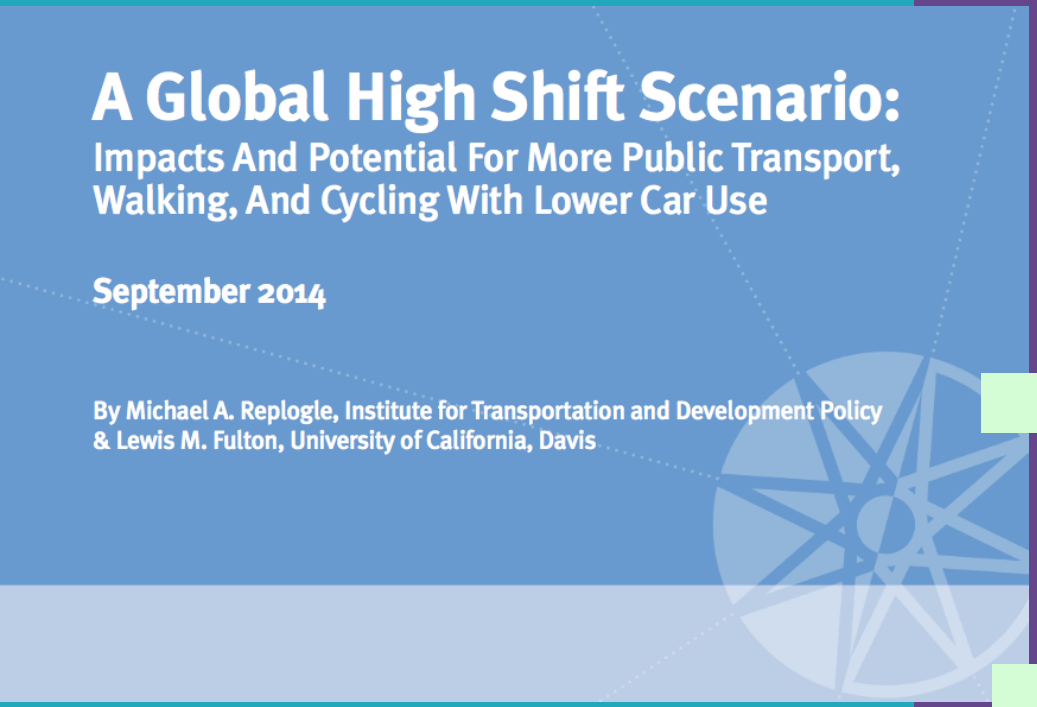

- Replogle, M. A. and Fulton, L. 2015. **A Global High Shift Scenario: Impacts and Potential for More Public Transport, Walking, and Cycling with Lower Car Use.** Institute for Transportation and Development Policy (**ITDP**), New York, and University of California, Davis (eds.), September 2015.

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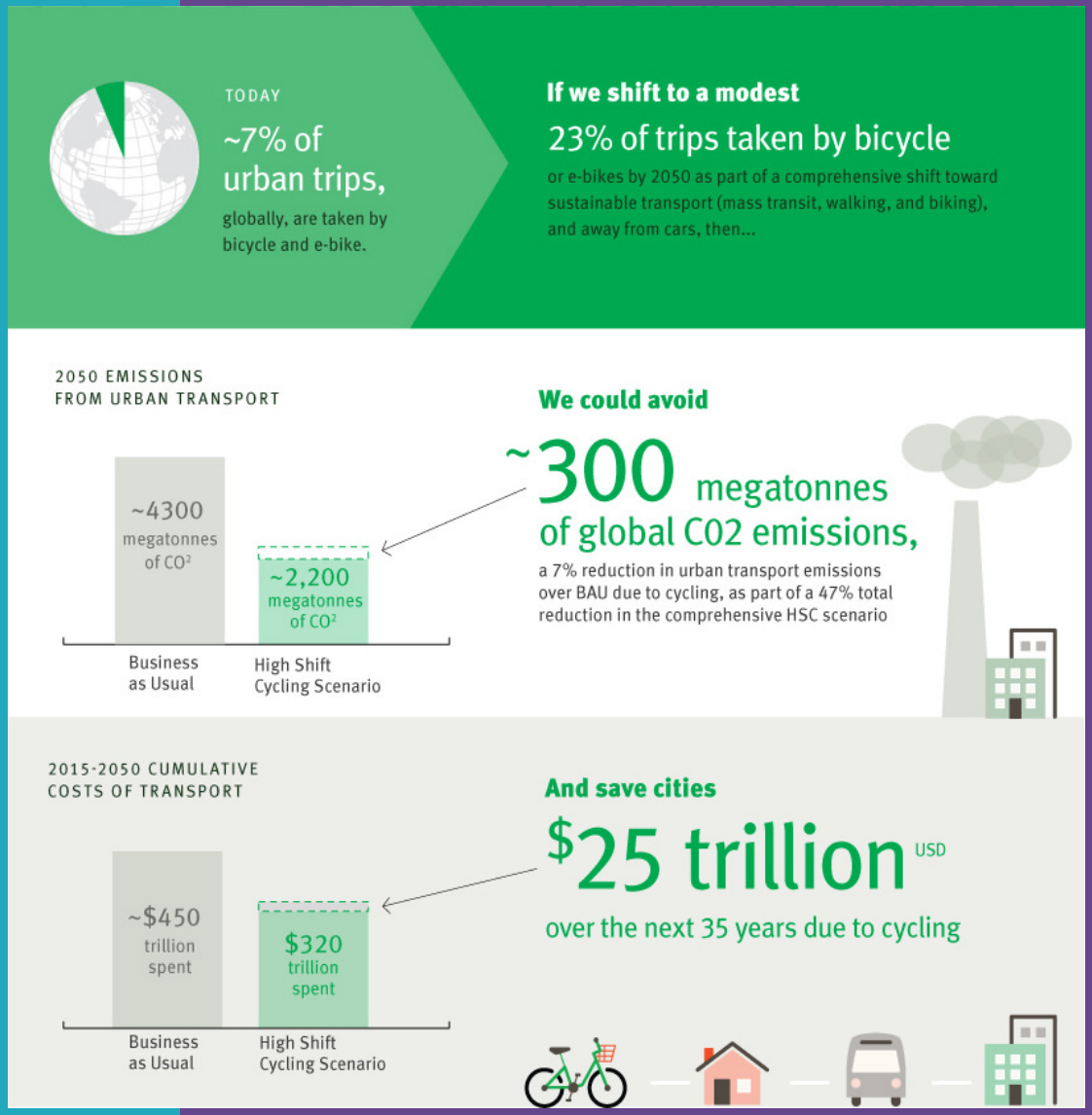

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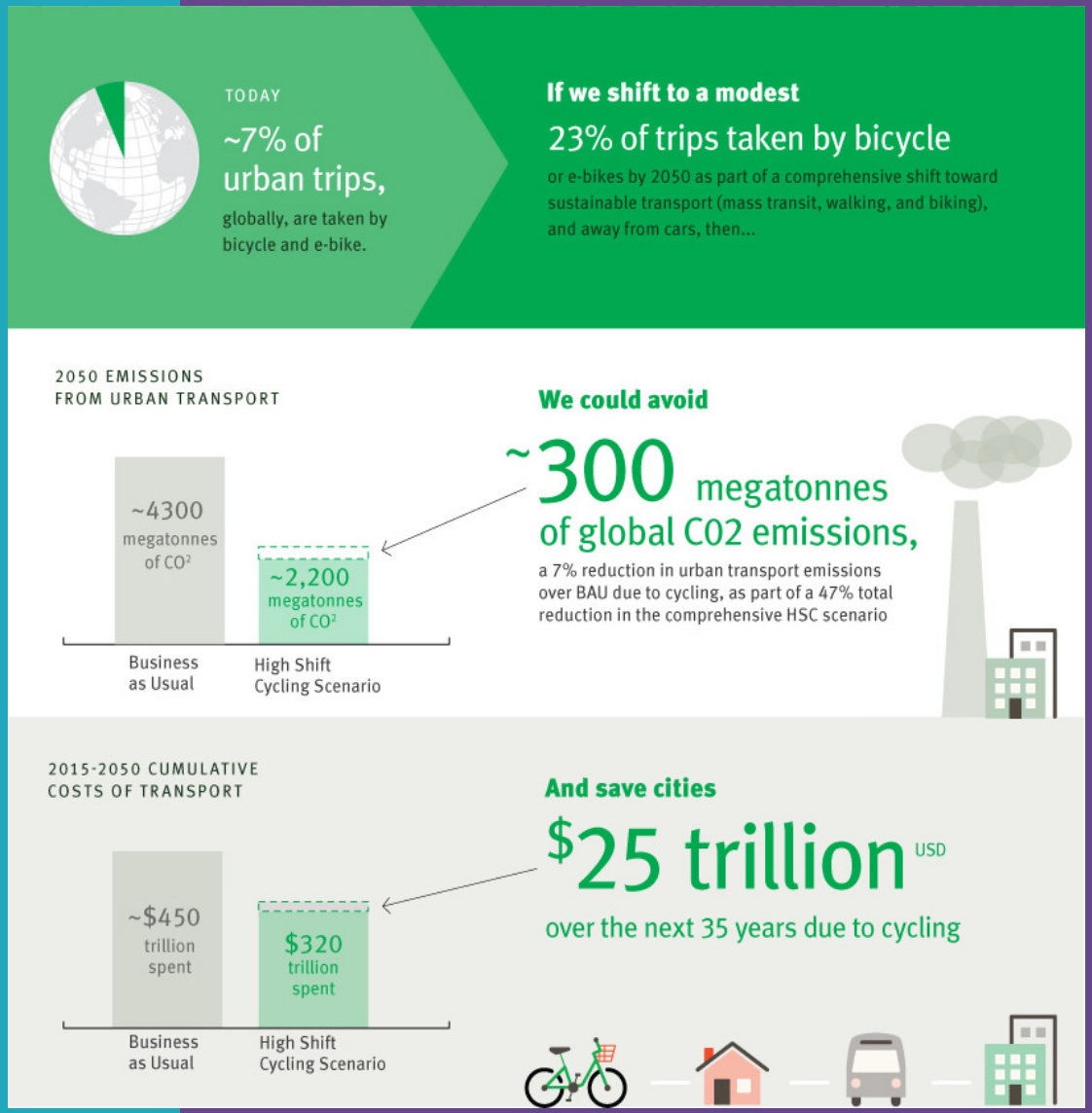

THE GLOBAL GOALS
For Sustainable Development

8 DECENT WORK AND ECONOMIC GROWTH

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3. about economic research based on general approaches

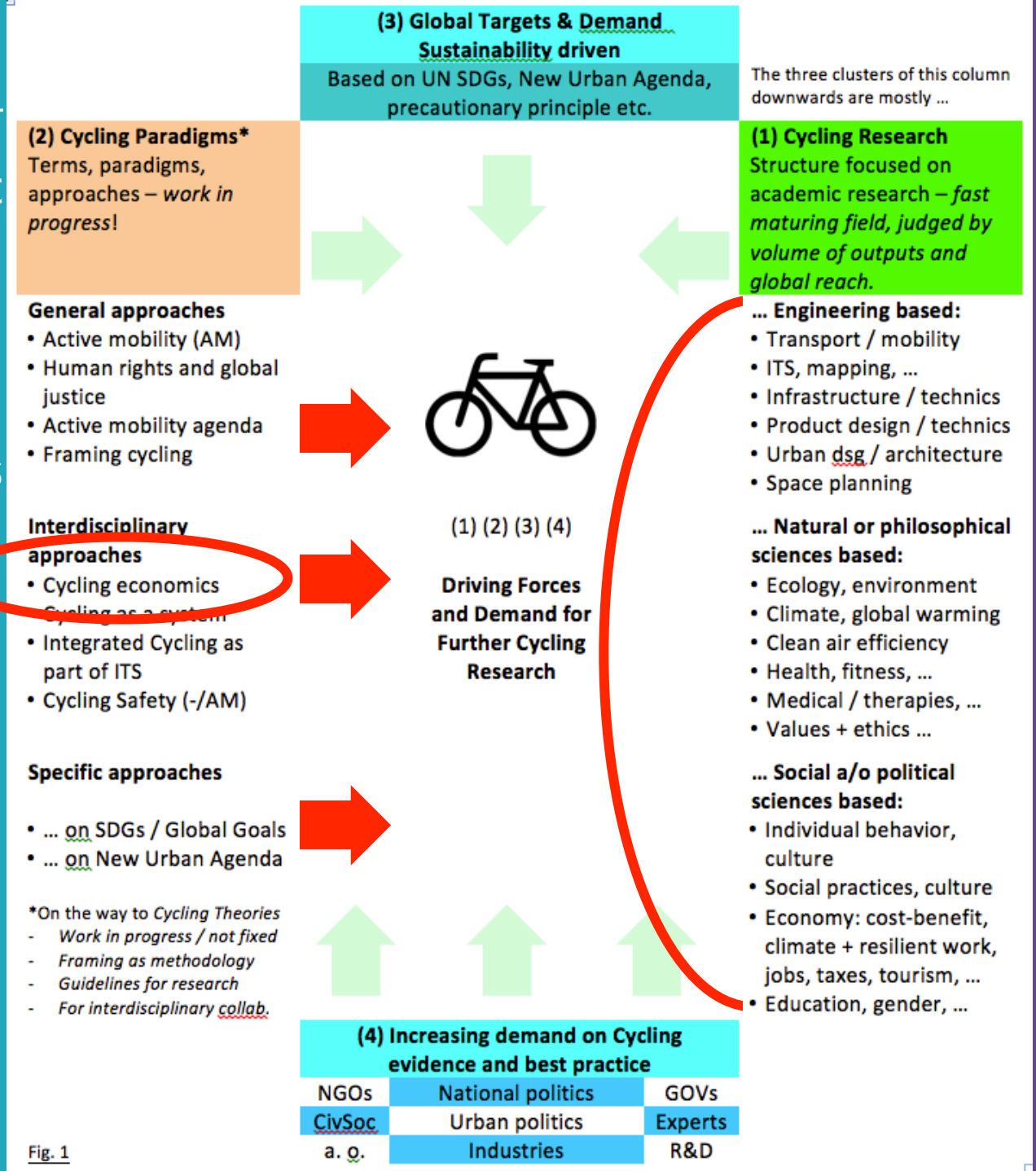

Fig. 1

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3. study about "The EU cycling economy"

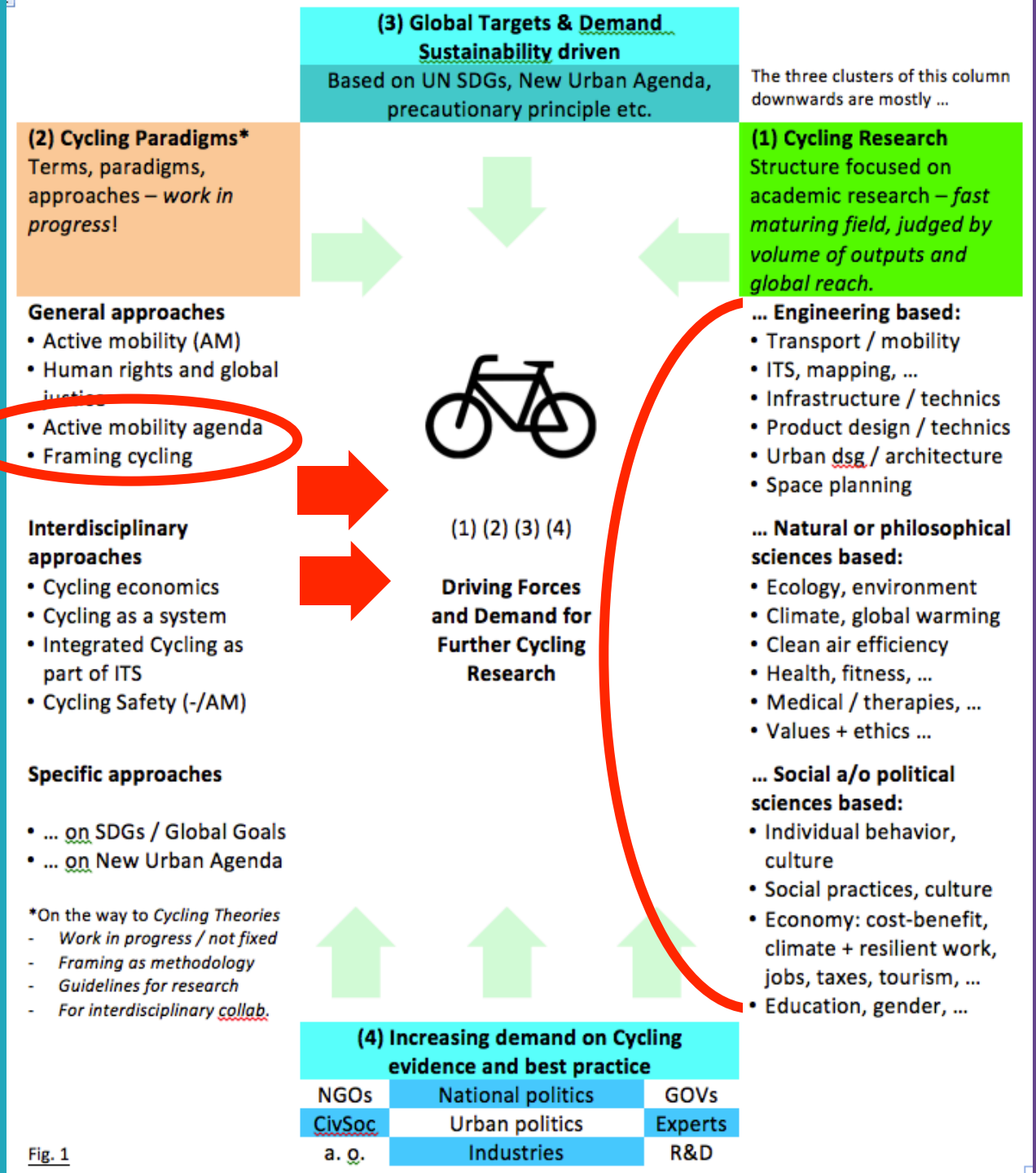

Fig. 1

Scientists for cycling

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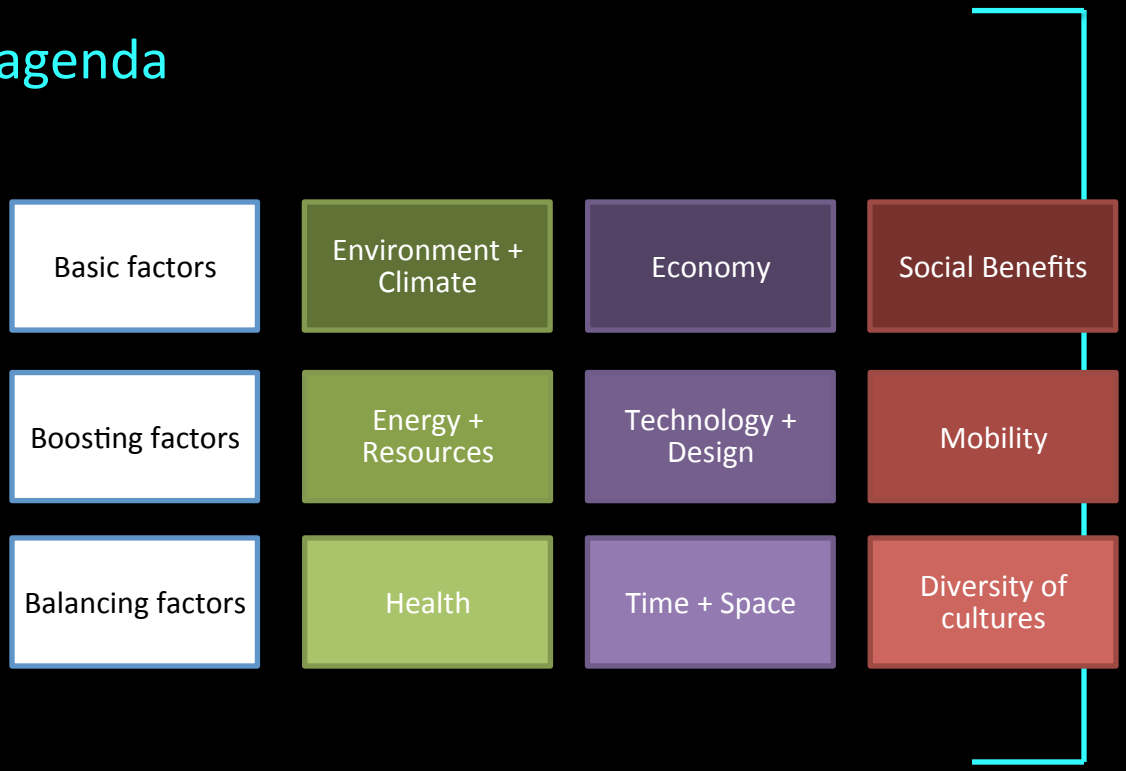
The EU cycling economy

Contributions from cycling economics – increasing benefits to unleash – evaluation based on all 9 key-issues of the

active mobility agenda



The UN Sustainable Development Goals

Contributions from cycling economics – increasing benefits to unleash

active mobility agenda

Basic factors	Environment + Climate	Economy	Social Benefits
Boosting factors	Energy + Resources	Technology + Design	Mobility
Balancing factors	Health	Time + Space	Diversity of cultures

The EU cycling economy

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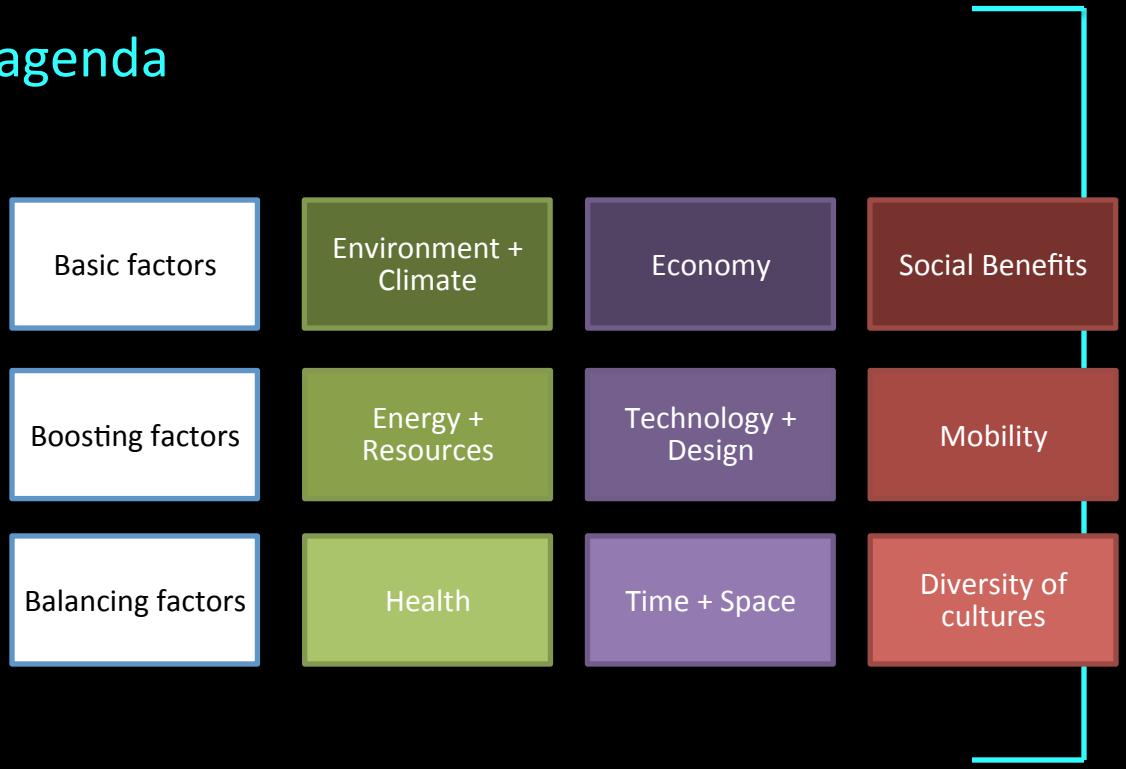

The EU cycling economy

Contributions from cycling economics – increasing benefits to unleash – evaluation based on all 9 key-issues of the

active mobility agenda

Eatable 9 key-issues at the launch of the "EU cycling economy", Brussels Dec 6, 2016.

Scientists for cycling
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ECF

The EU cycling economy

Contributions from cycling economics – increasing benefits to unleash – evaluation based on all 9 key-issues of the

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The EU cycling economy

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active mobility agenda

on values .....

on transparency .....

framing

Environment + Climate	Economy	Social Benefits
Energy + Resources	Technology + Design	Mobility
Health	Time + Space	Diversity of cultures

The EU cycling economy

Contributions from cycling economics – increasing benefits to unleash – evaluation based on all 9 key-issues of the

	Calculations based on concrete evidence	Calculations based on best available data	Estimations based on best available indications	Total value
Hard facts	239.99 bn €			239,99 bn €
Data based calculations	239.99 bn €	90.7 bn €		330.69 bn €
Total value	**239.99 bn €**	**90.7 bn €**	**182.5 bn € plus x**	**513.19 bn € plus x**

on values .....

on transparency .....

results

Scientists for cycling
M. Neun

ECF

3.2 the results

The EU cycling economy

Contributions from cycling economics – increasing benefits to unleash – evaluation based on all 9 key-issues of the

	Calculations based on concrete evidence	Calculations based on best available data	Estimations based on best available indications	Total value
Hard facts	239.99 bn €			239,99 bn €
Data based calculations	239.99 bn €	90.7 bn €		330.69 bn €
Total value	**239.99 bn €**	**90.7 bn €**	**182.5 bn € plus x**	**513.19 bn € plus x**

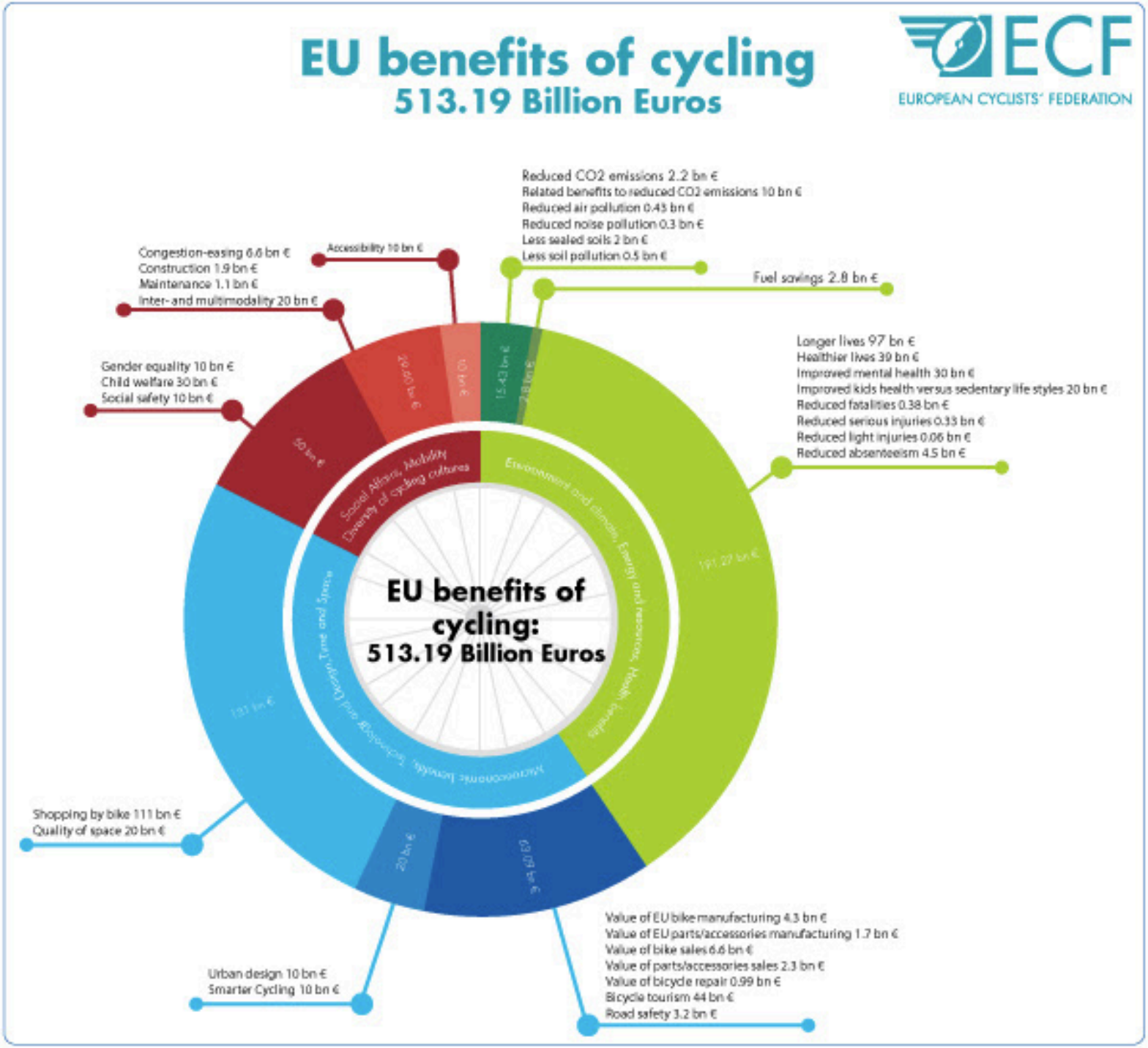
on values .....

on transparency .....

results

Scientists for cycling
M. Neun

3.2 the results in detail



Scientists for cycling

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The EU cycling economy

Results in detail …

jobs

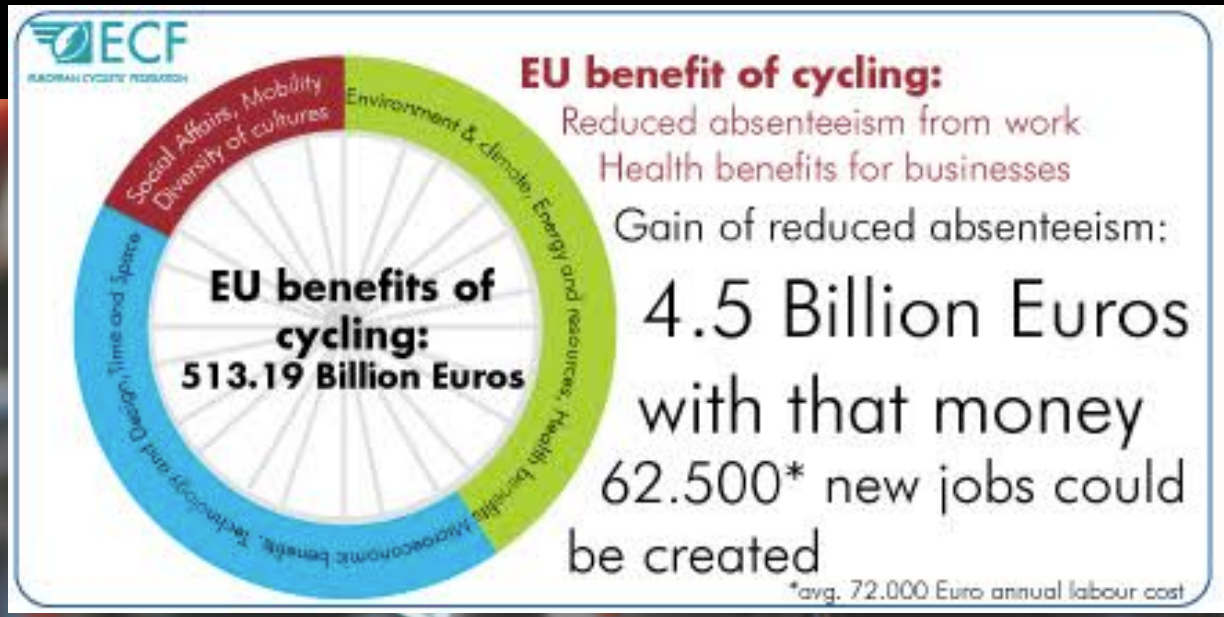
green growth

The EU cycling economy

Results in detail are highlighting: CYCLING FOR GROWTH

jobs

green growth



The EU cycling strategy

perspecties

green growth

on values .....

on transparency .....

best knowledge based ...

on current demand .....

The EU cycling strategy

perspecties

green growth

on values ……

on transparency ……

best knowledge based …

on current demand ……

1. sustainable + integrated context for politics
2. civic participation – good for democracy
3. inclusive, sustainable and integrated solutions
4. Best solutions for a global growing demand for sustainable living

The EU cycling strategy

putting the EU on the cycle track

green growth

on values .....

on transparency .....

best knowledge based ...

on current demand .....

... and overall?

europe

as a role model for sustainable development!

The EU cycling strategy

putting the EU on the cycle track

on the occasion of the presentation of the EU cycling economy report
with cycling benefits of about half a trillion € per year
calculations based on the active-mobility-agenda
+ increasing demand on further research

The EU cycling strategy

putting the EU on the cycle track

EU level:

The Junker Commission Priorities

- Priority 1 (Jobs, Growth and Investment)
- Priority 3 (Energy Union –Climate change)
- Priority 4 (A Deeper and Fairer Internal Market with a Strengthened Industrial Base)

The EU cycling strategy

putting the EU on the cycle track

EU CYCLING STRATEGY

on the occasion of the presentation of the EU cycling economy report
with cycling benefits of about half a trillion € per year
calculations based on the active-mobility-agenda
+ increasing demand on further research

Scientists for cycling

M. Neun

The EU cycling strategy

putting Portugal on the cycle track

cycling economic perspectives

putting into focus:

- e-cycling, e-mobility
- “smarter cycling” + AM hybrid scenario
- integrated cycling, ITS + fusion

4.1 cycling futures – e-mobility driving forces

e-cycling

BOSCH EBIKE SYSTEMS
MARKET INFO

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eBike: Pedelec Target Groups

Trend in all Segments – All Types of Bicycles will be Electrified!

2010 → 2016

Target group: 60+ → 50+ → 40+ → 30+

Urban

City/ Trekking

Commuter, Hobby, Tour

Private use

Fun

Sportive

Fascination

Enjoyment

Social acceptance

Cool

Road

MTB/ Fully

Urban

City/ Trekking

Cargo

Livestyle & Sport

Tourism

Commuter & Hobby

Fleets

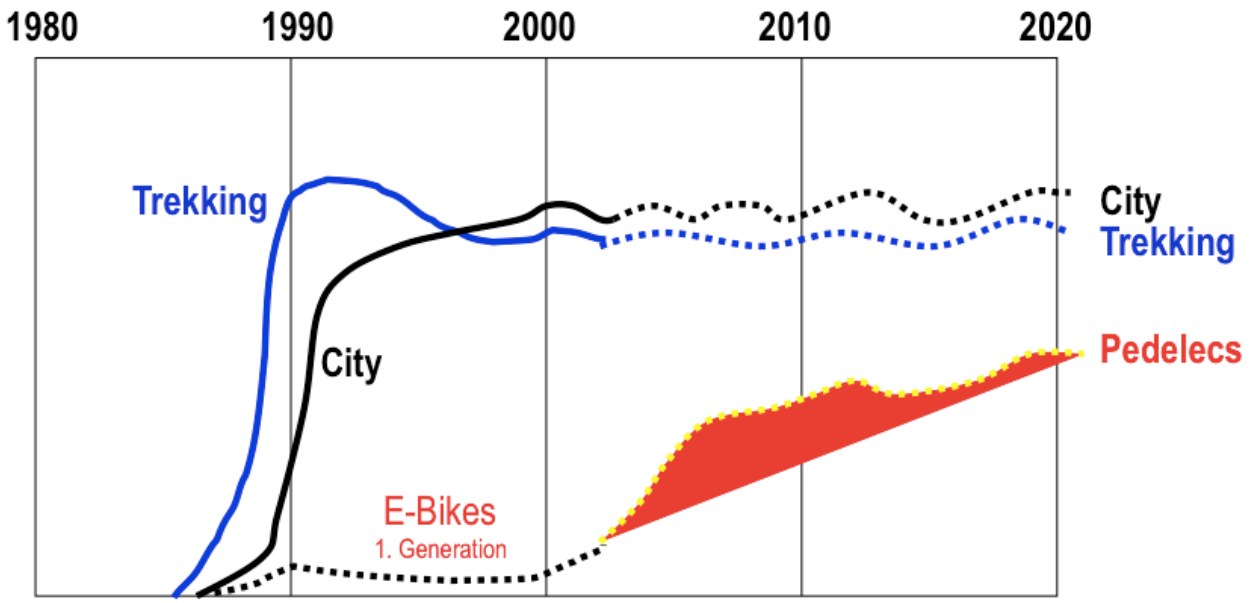
Family & Commercial

BOSCH

Invented for life

eBike: Pedelec Target Groups

Trend in all Segments – All Types of Bicycles will be Electrified!



Neun, M. 2002. *Pedelecs – Rückenwind für den Fachhandel*. Fachvortrag beim Fahrradkongress 'fahrrad.markt.zukunft'. Bremen, 02.03.2002.

eBike: Pedelec Target Groups

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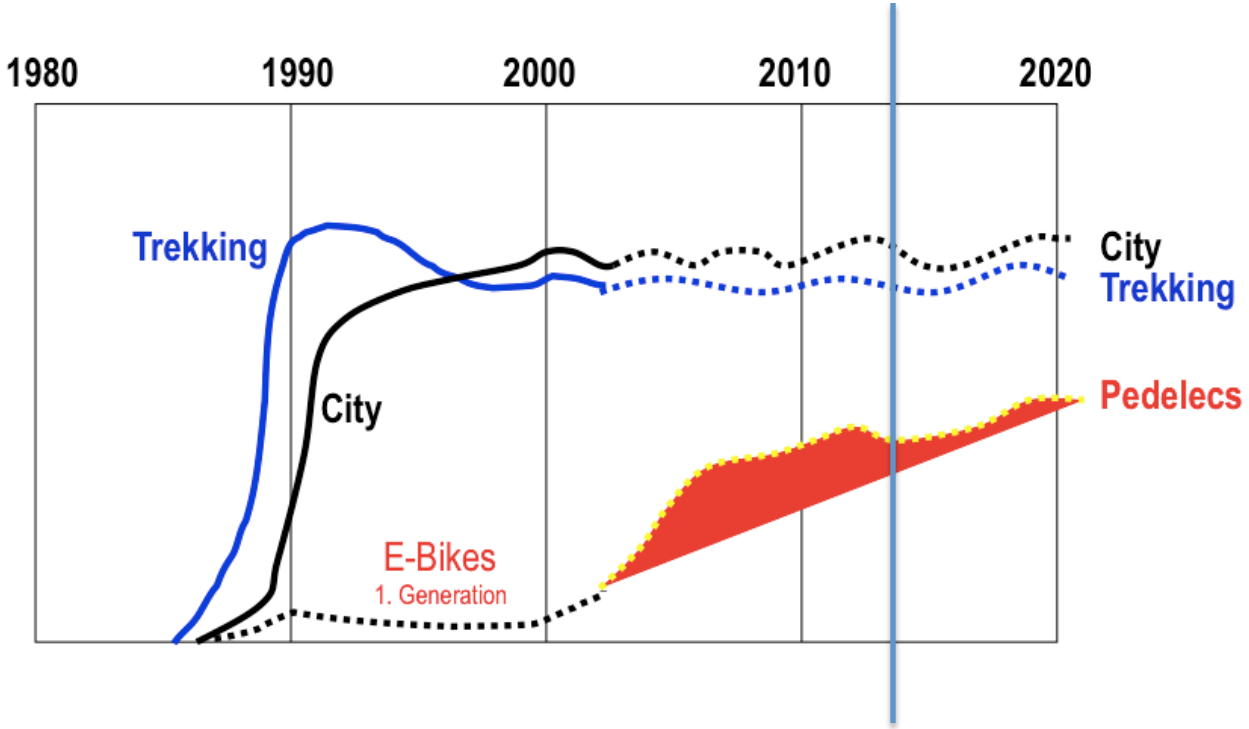


Neun, M. 2002. *Pedelecs – Rückenwind für den Fachhandel*. Fachvortrag beim Fahrradkongress 'fahrrad.markt.zukunft'. Bremen, 02.03.2002.

eBike: Electric Bicycles are … Fun!

eBikes are…

- an affordable and fascinating mobility solution
- ecologically reasonable
- and they are … fun!

Study Result:
eBikers ride more often (2-3x) and longer (2-3x) than comparable cyclist

eBike: Pedelec Target Groups

Trend in all Segments – All Types of Bicycles will be Electrified!

2010 → 2016

Target group: 60+ → 50+ → 40+ → 30+

Commuter, Hobby, Tour

Private use

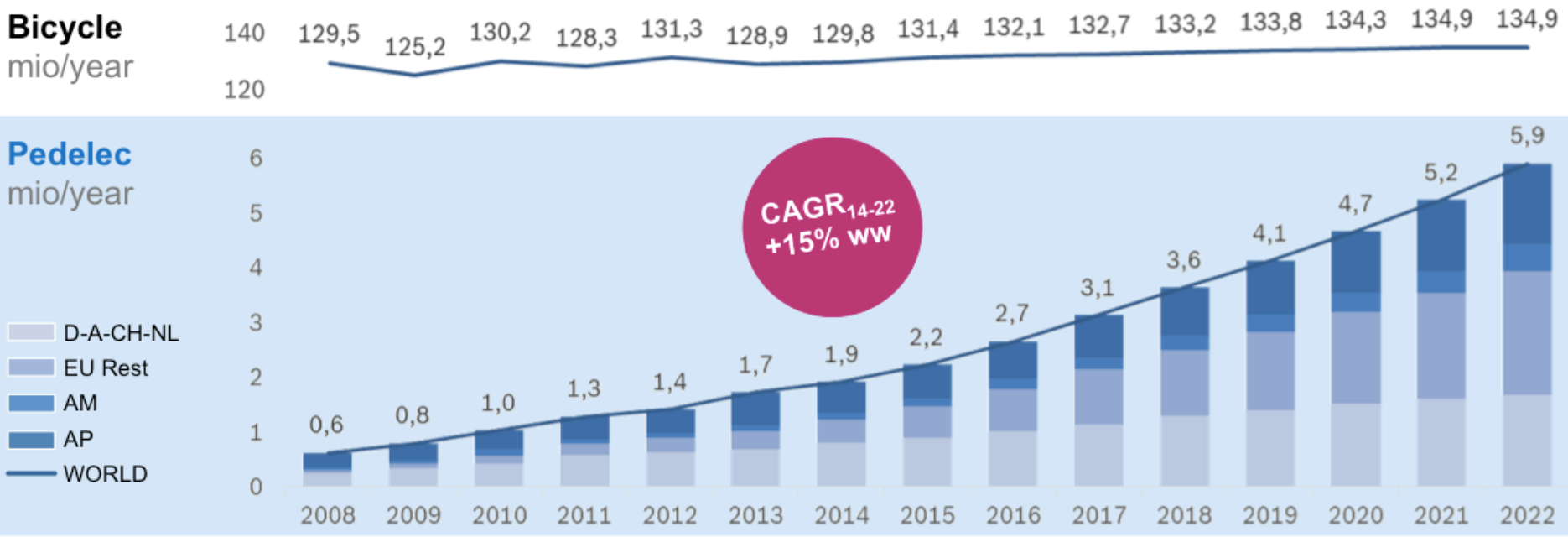
- Fun
- Sportive
- Fascination
- Enjoyment
- Social acceptance
- Cool

- Livestyle & Sport
- Tourism
- Commuter & Hobby
- Fleets
- Family & Commercial

BOSCH
Invented for life

eBike: Pedelec Market

Market Growth & Electrification Share



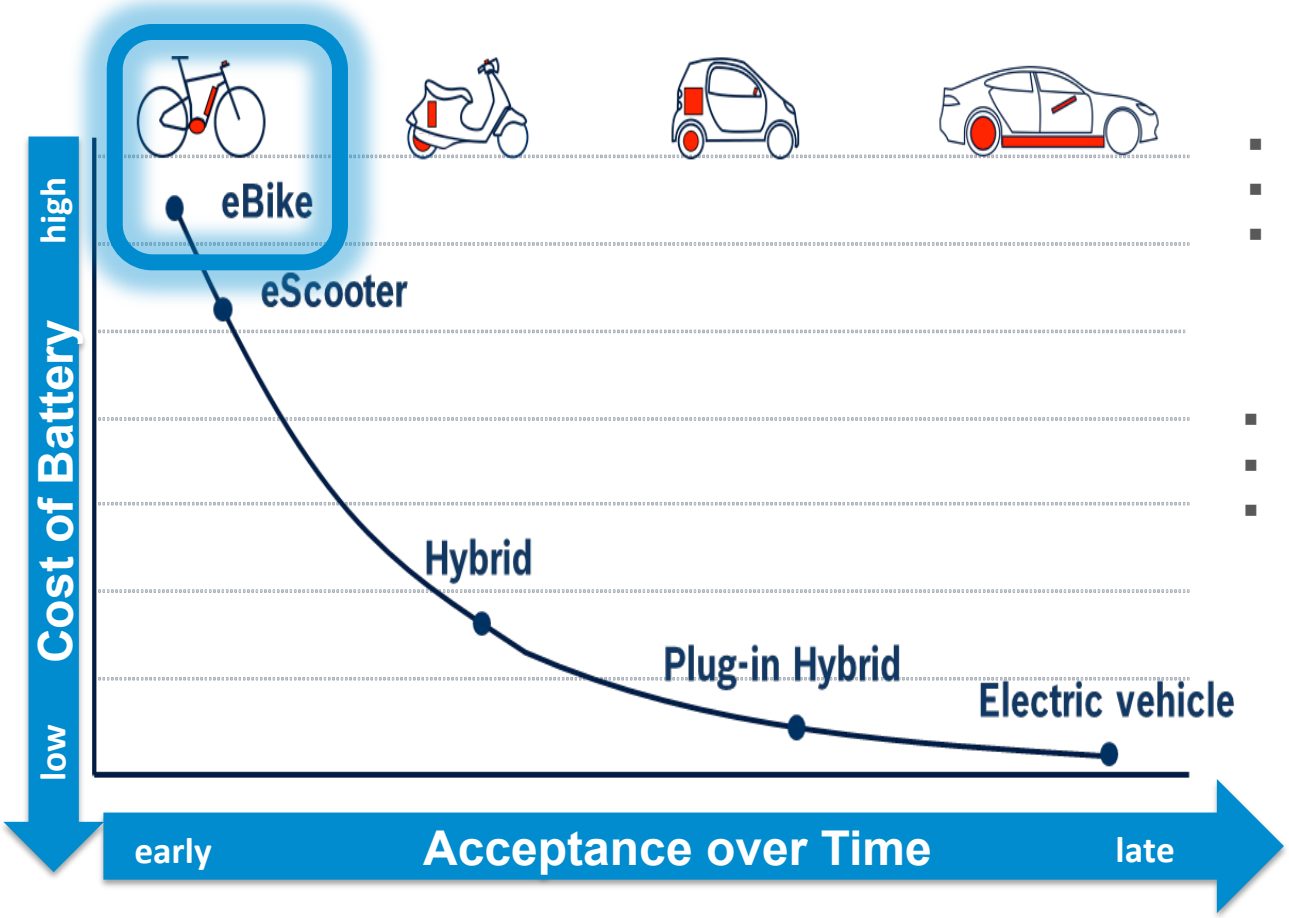
Pedelec
Share %

D-A-CH-NL	4,0%	5,5%	7,0%	9,8%	11,2%	12,7%	13,7%	15,1%	17,0%	19,1%	21,6%	23,5%	25,6%	26,9%	28,2%
EUR Rest	0,4%	0,7%	1,1%	1,5%	1,8%	2,3%	2,8%	3,7%	5,0%	6,4%	7,7%	9,0%	10,4%	12,1%	14,2%
US+CAN	0,2%	0,3%	0,6%	0,4%	0,4%	0,5%	0,6%	0,7%	0,9%	1,0%	1,2%	1,4%	1,6%	1,8%	2,0%
JP	2,7%	3,2%	3,6%	3,8%	4,0%	6,0%	5,9%	5,6%	5,8%	6,2%	6,5%	6,8%	7,1%	7,5%	7,9%
WORLD	0,5%	0,6%	0,8%	1,0%	1,1%	1,3%	1,5%	1,7%	2,0%	2,4%	2,7%	3,1%	3,5%	3,9%	4,4%

BOSCH
Invented for life

eBike: Electro Mobility

Why eBikes outpace eCars and Light Electric Vehicles



eBike vs bicycle

- low power, small battery
- acceptable cost
- added value: range, comfort, fun (!)

eCar vs Car

- high power, large battery
- unacceptable high cost
- low value: limited range, long charging time

BOSCH
Invented for life

Bicycles and especially Electric Bicycles will play a major role in personal mobility, in recreation and in commercial transportation.

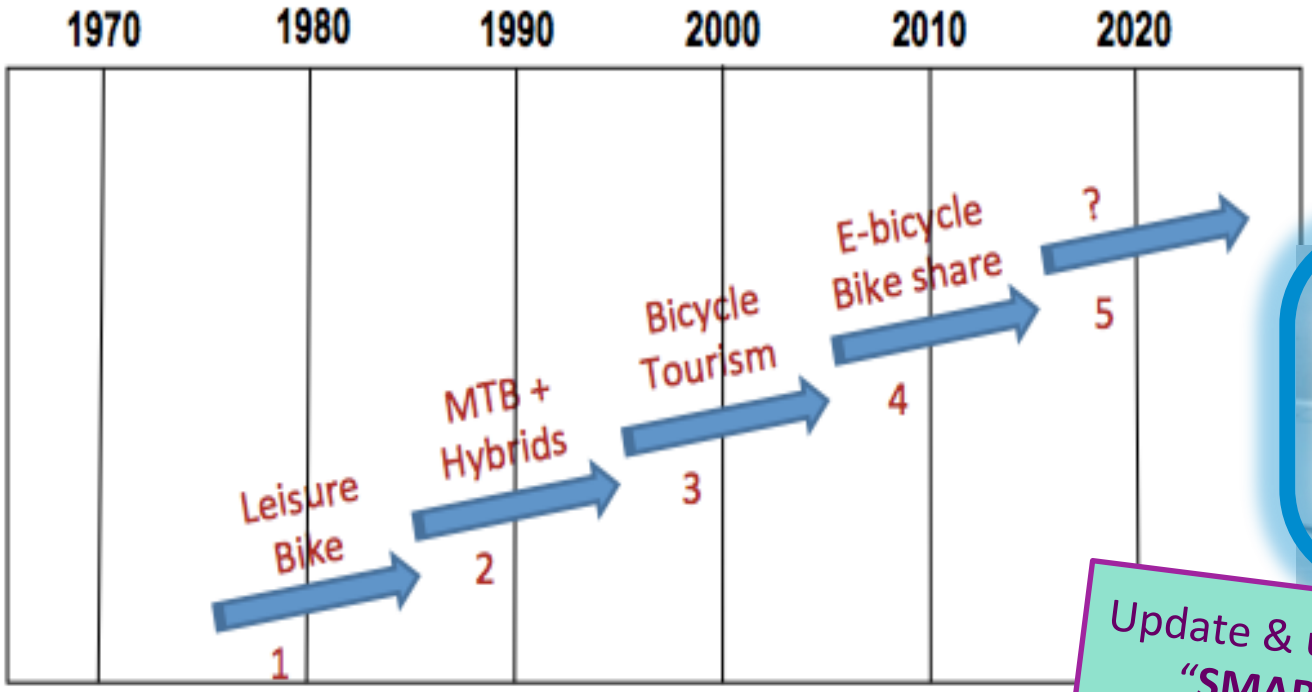
Bicycles and especially Electric Bicycles will play a major role in personal mobility, in recreation and in commercial transportation.

4.2 **Bicycles** and the Smarter Cycling Concept

4.2 **Bicycles** and the Smarter Cycling Concept

4.2 **Cycling economy** and Smarter Cycling

The product development for “modern cycling” was leapfrogging – driving forces for the Evolution of Cycling.



Fleet

Update & upgrade in phase **5** **“SMARTER CYCLING”**

The bike industry subsequent innovations as driving forces for development, e.g. German-CH-A markets

Manfred Neun [2011]: Re-inventing the Bicycle for Creating Healthier and Wealthier Societies, University of Tampere. Lecture, Sept 16th 2011, Helsinki.

Scientists for cycling

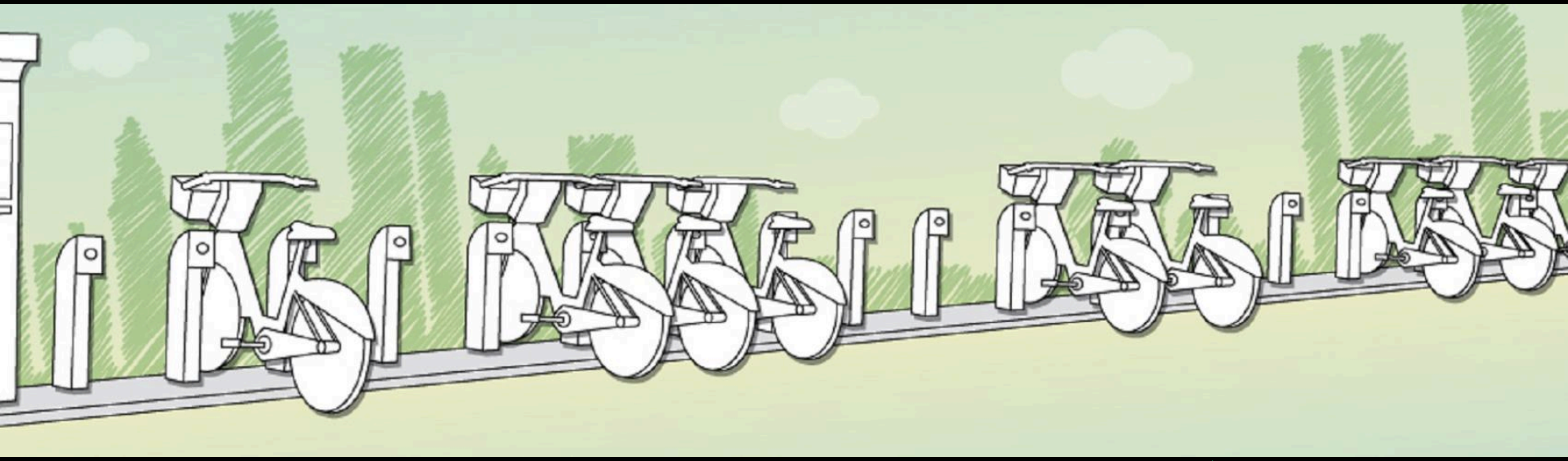
cycle highways and e-cycling development

4.2 CHW - integrated capacity building

http://edition.cnn.com/2015/03/04/tech/city-cycle-super-highways/

cycling and e-cycling development

4.2 PBS - integrated transport solutions



smarter cycling

ECF

cycling and e-cycling development

4.3 ITS – integrated transport solutions

Fleet

smarter cycling

ECF

e-cycling development

4.3 ITS – integrated transport solutions

cycling and e-cycling development

4.3 ITS – integrated transport solutions

its world congr
copenhagen

09-18

connected
cycling

ECF

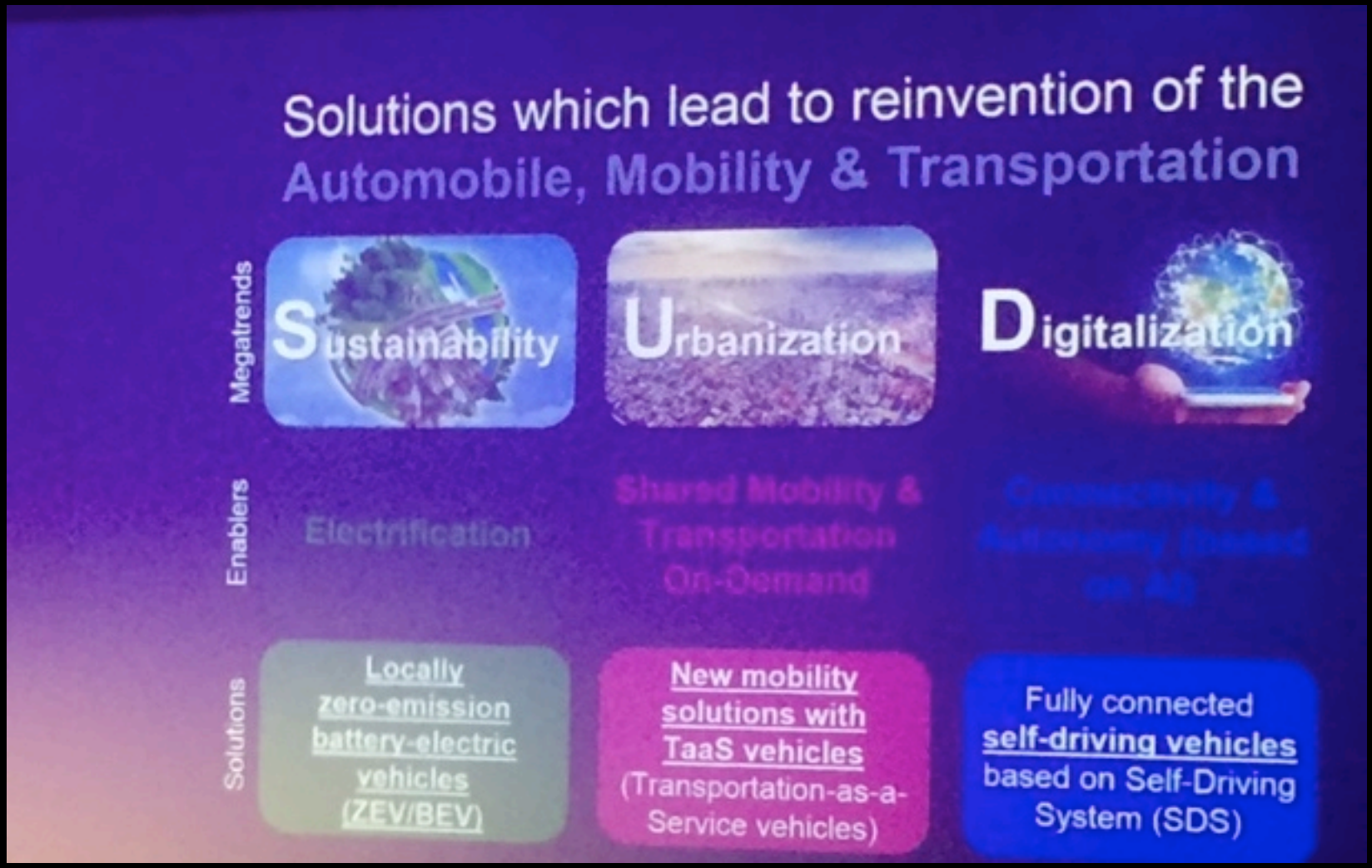
what we will meet … virtual future

ECF

what we will meet … virtual economy

ECF

what we will meet … virtual economy



what we will meet … new car economy

Jungwirth, J. 2016. The Masterplan: MOBILITY FOR ALL! - The Disruption of the Automotive Industry and Reinvention of Mobility. Published in Linkedin, July 14,2016. Available at: https://www.linkedin.com/pulse/masterplan-mobility-all-disruption-automotive-johann-jungwirth [accessed: 27.03.2017].
> Public space reduction by less cars driving plus space winning by significant reduced parking spaces.

Jungwirth, J. 2016. Disruption of the Automotive Industry – How the Digital Transformation changes Volkswagen. Keynote speech at International Automotive Congress – Mobility goes Digital. Wolfsburg, October 17, 2016. Available at: https://www.izb-kongress.com/fileadmin/IZB-Kongress/Kongress_2016/Downloads/Jungwirth_IZB_Digital_Transformation_Volkswagen_Group.pdf [accessed: 27.03.2017].

ECF

what we will meet … new car economy

Evolution as a driving force of the Automotive Industry – how the hybrid transformation changes the world …

ECF

what we will meet …

Evolution as a driving force of the Automotive Industry – how the hybrid transformation changes the world …

what we will meet ....

Evolution as a driving force of the Automotive Industry – how the hybrid transformation changes the world …

ECF

4.3. what we will meet … AM vehicles

Active Mobility hybrids as a driving force of the Automotive Industry – how Active Mobility changes the world …

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4.3. what we will meet … AM vehicles

Active Mobility hybrids as a driving force of the Automotive Industry – how Active Mobility changes the world …

ECF

5. The Economic Value of Cycling
CONCLUSION

1. The economic values of cycling and Active Mobility are tremendous – in general and specifically on jobs, green growth and development.
2. Cycling Economics is an interdisciplinary approach, based on values.
3. We are at the beginning…
4. Politics is at the beginning…
5. Cycling research is essential.
6. Sustainability counts – Global Goals are essential.
7. We are at the beginning of a promising EU cycling strategy development.
8. Risks and challenges are high, but the opportunities are even higher.
9. Also Portugal is at the very beginning.
10. But, as collaborations are essential, there are allies around.

EU CYCLING STRATEGY

5. The Economic Value of Cycling
CONGRATULATIONS

OBJECTIVES

More bicycles, better cities, healthier society and economy.

5. Cycling Economics – S4C invitations

02-16 Velo-city 2016 taipei

11-16 universidade de aveiro

01-17 TRB

02-17 臺大先進公共運輸研究中心 Advanced Public Transportation Research Center

06-17 Velo-city 2017 arnhem-nijmegen

09-17 icc mannheim

10-17 tdm-symp NTU & Eco Mobility world

06-18 S4C in europe

09-18 its world congr copenhagen

Velo-city 2018 rio de janeiro

connected cycling

Scientists for cycling

ECF EUROPEAN CYCLISTS' FEDERATION

The Economic Value of Cycling

ECF studies about current cycling research

thank you

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