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Eawag:
Swiss Federal Institute of Aquatic Science and Technology

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STCA application showcase #1

Transition in a leading region of the global car industry:

from the internal combustion to the electric drive train

The case of Baden-Württemberg, Germany, 2010 - 2023

Prof. Bernhard Truffer

Eawag, Switzerland
Utrecht University, the Netherlands

STCA showcase#1, Recorded: 30.04. 2024

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Who should listen to this Webtalk?

- What is STCA
  - A method to retrace configurations of social and technical elements from coded documents
  - Building on insights from event and social network analysis
  - Originally developed in the context of Transition Studies
- Precondition for easily following the content of this talk
  - Basic understanding of the STCA method → guidebook
  - Looking for inspiration for a potential first own application case
- Main aim: short report on how to apply STCA to an empirical case
  - Research problem
  - Data base and coding
  - Choices of representational parameters in the networks
  - Insights gained

For a detailed introduction, see:

- STCA guidebook: http://stca.guide
- Introductory presentation: STCA tutorial #1: https://www.youtube.com/watch?v=zrI6MXgdBMs

Technical hint

- References to coding relate to the MaxQDA software
- Network visualizations were executed in Visone software

1. The research problem

- Problem focus of the paper*
  - How can leading regions cope with global socio-technical transitions?
  - Baden-Württemberg: leading global automobile manufacturing region having to cope with the transition towards the electric car
  - Impact on economic prospects, jobs in value chains, educational structures, industrial policies, imaginaries
- Focus of the STCA part of the analysis
  - Retracing regional coping as reported in newspaper articles 2010 -2023
  - Coping cycle: Denial, experimentation, acceptance

* Gong and Truffer (2024) Changing from within: the interplay between imaginary, culture and innovation system in regional transformation. *GEIST – Geography of Innovation and Sustainability Transitions*, 2024(02), GEIST Working Paper series.

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2. Database and coding

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- Nexis-Uni search term: future, automobile, electric cars
- 170 German articles (mostly Stuttgarter Zeitung) 2010 - 2023
- 36 concept codes (795 text segments)
  - Mixed substantive and discursive codes
- 21 actor codes (517 text segments)

Concepts

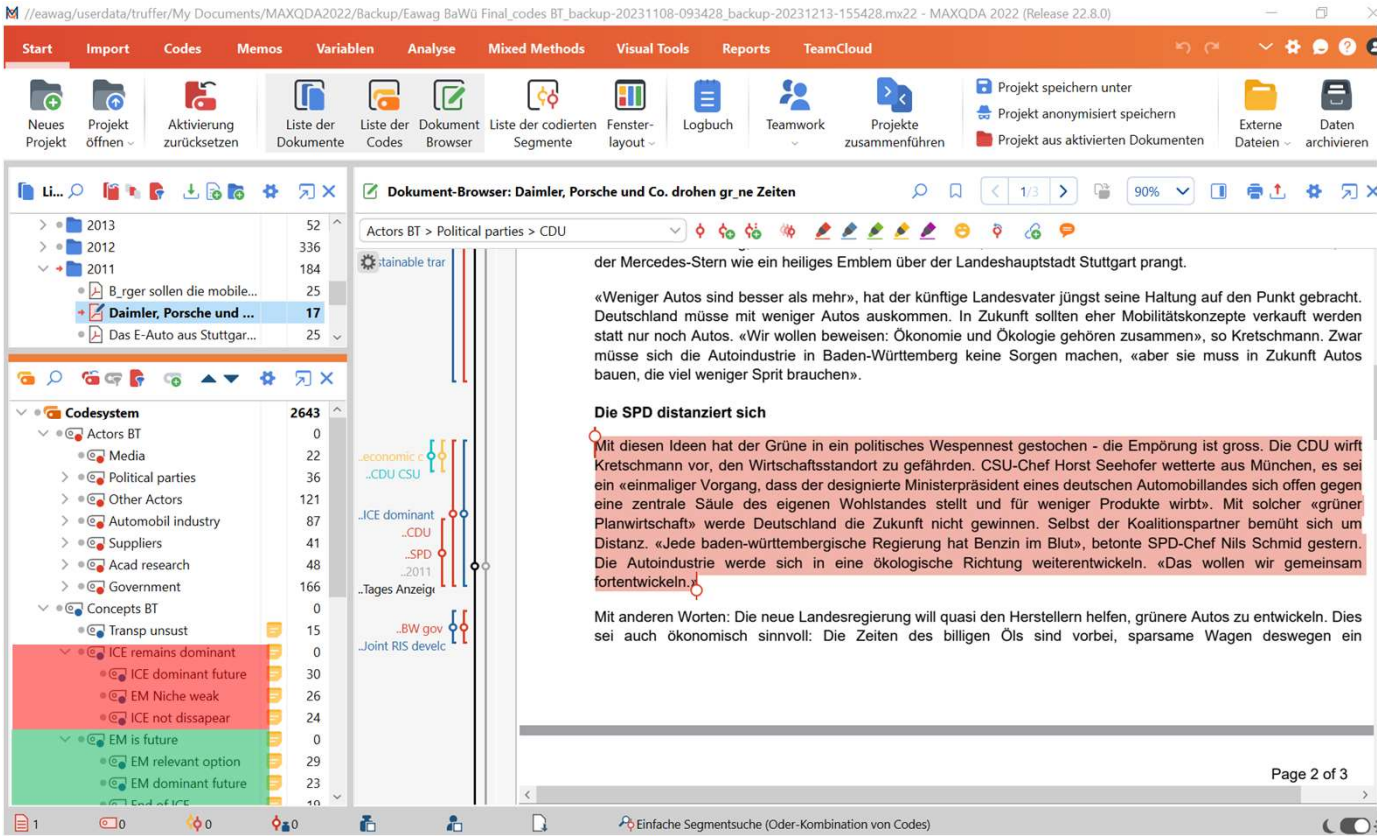
Transp unsust	15
ICE remains dominant	
ICE dominant future	30
EM Niche weak	26
ICE not dissapear	24
EM is future	
EM relevant option	29
EM dominant future	23
End of ICE	19
Transition needed	19
Diesel gate	5
Gov support needed	
Support policies	31
Research prog and startups	23
Demonstr and clusters	31
Strong RIS	
Strong BW RIS	16
Joint RIS development	32
Cross-sector synergies	8
Imaginaries	
Craddle imaginary	16
Future mob imaginary	35
Tensions in RIS	
BW is lagging	21
Disruptive dynamics	24
International influence	
Intern competition	26
Intern collaborations	10
Labor market	
Impacts on LabMarket	34
Invest in knowl base	31
Mob Services	
Sustainable transport	17
Integr mob concepts	15
ICT and KI	16
Electric cars dev	16
Infra and batteries	
Grid capacity	19
Battery dev	26
Charging infra	46
Manufact and infrainvest	33
Inst Innovation	
New Busin models	11
Instit Change	15
Alt Mobforms	
Fuelcells and Hydrogen	25
Carsharing	14
Auton cars	9
Efuels	4

Actors

Media	22
Political parties	
AFD	1
FDP	8
SPD	6
CDU	9
Green	12
Other Companies	
Users citizens NGOs	16
CS and DB	6
Ind Associations	15
Trade unions	27
EMBW & Consultants	29
EnBW & utilities	26
Automobil industry	
Other car comp	31
Daimler	56
Suppliers	
Other supp	16
Bosch	25
Acad research	
Research Institutes	28
Universities	20
Government	
EU	6
National gov	26
BW gov	96
Local and city gov	36

2. Database and coding

- Coding MaxQDA
  - Years
  - Actors
  - Concepts
    - ICE (red)
    - EM (green)
  - Text segment “ICE dominant future”



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3. Drawing networks

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- Similarity metric (→ adjacency matrix in visone) → R-scripts
  - Cosine distance, to respect the frequency of codes in the layouts
- Time slices → MaxQDA
  - Coverage 2010 – 2023. Before that date little or no references to the search term
  - Periods:
    - 2010 – 2014: Emerging engagement with the topic before the Dieselgate broke
    - 2015 – 2019: Increased serious engagement and first investments
    - 2020 – 2023: Corona and normalization of the topic
- Aggregation/Sensitivity analysis → MaxQDA
  - At the lowest level of the coded text segments in the ultimate coding tree
  - Sensitivity analysis: → STCA guidebook website: → ***STCA tutorial #2***
- Layout → Visone
  - Centralized, radial to see the core of the coverage
  - Backbone Filter: 0.4 to eliminate minor links

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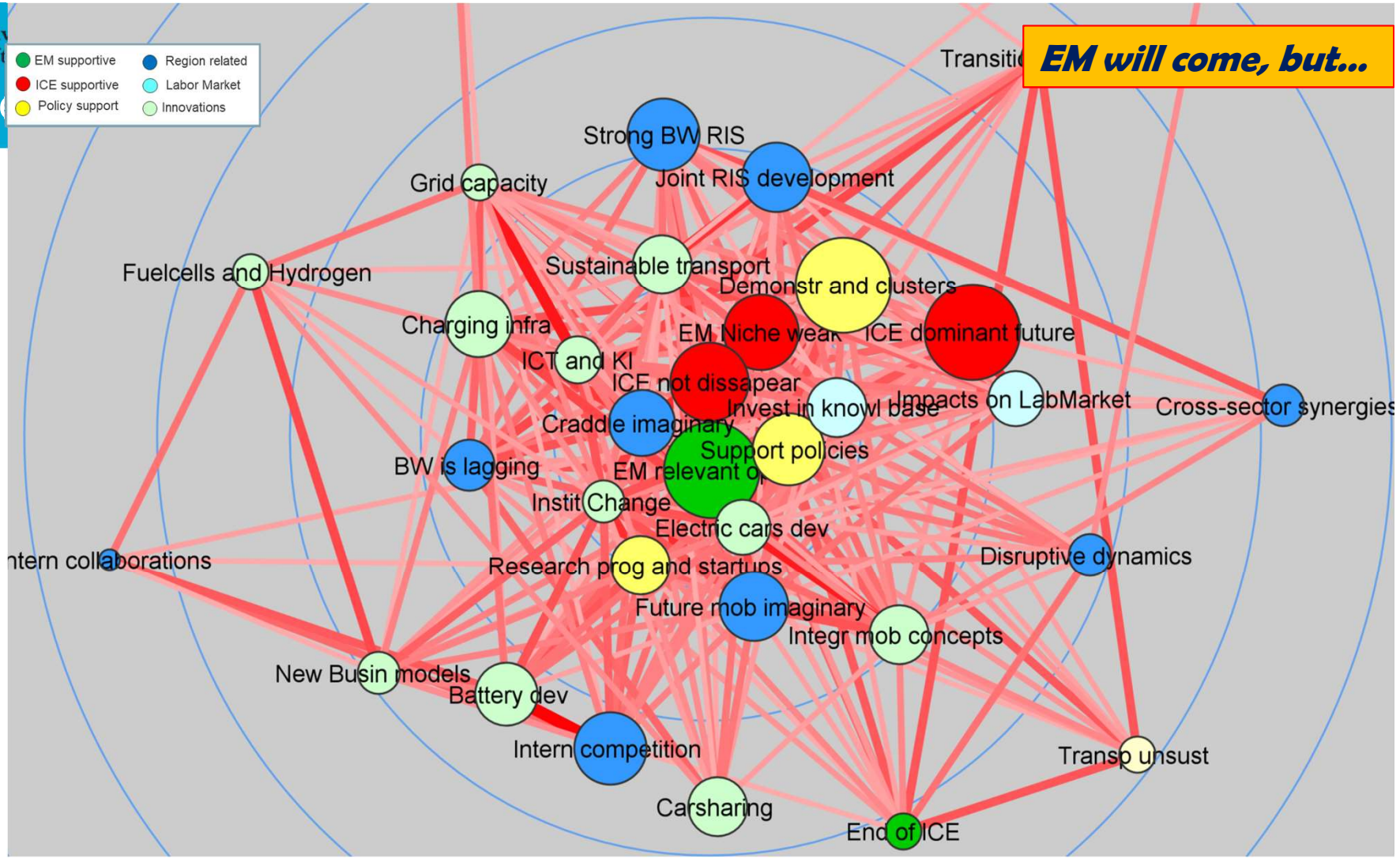
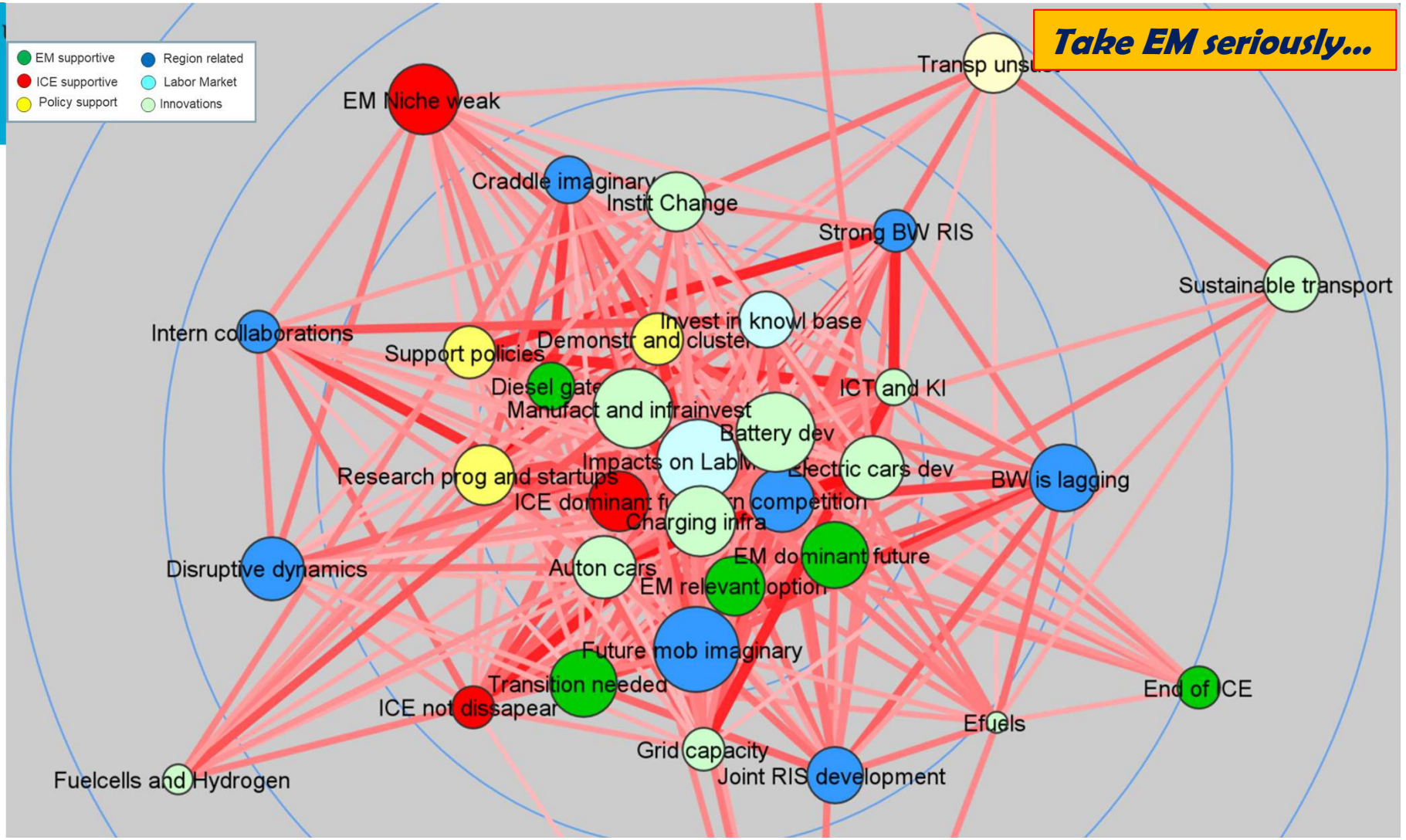
4. R

OMC 2010-2014 (centr rad; cosine; 0.4)



4.

OMC 2015-2019 (centr rad; cosine; 0.4)



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4. Results

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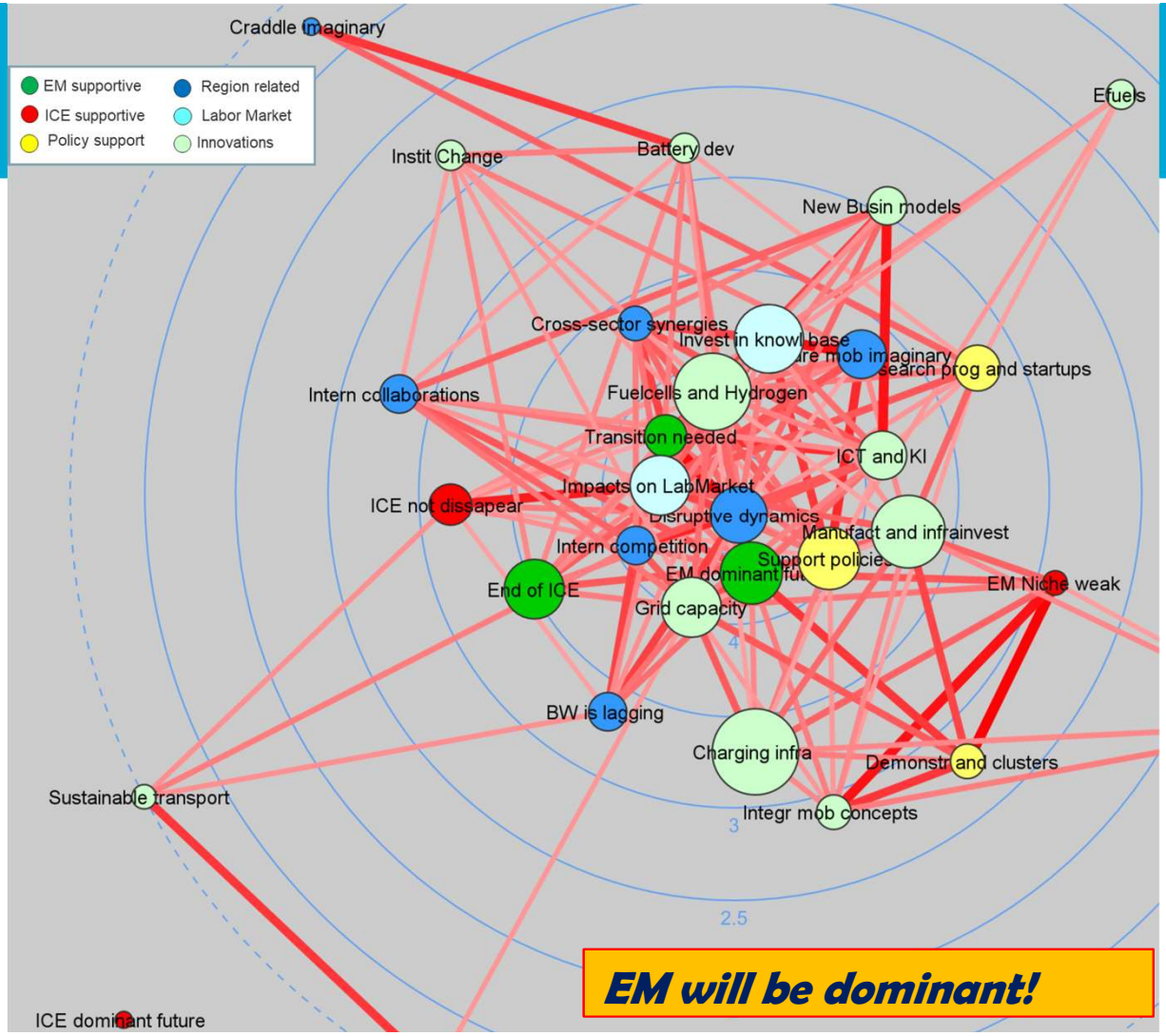
OMC 2020-2023 (centr rad; cosine; 0.4)



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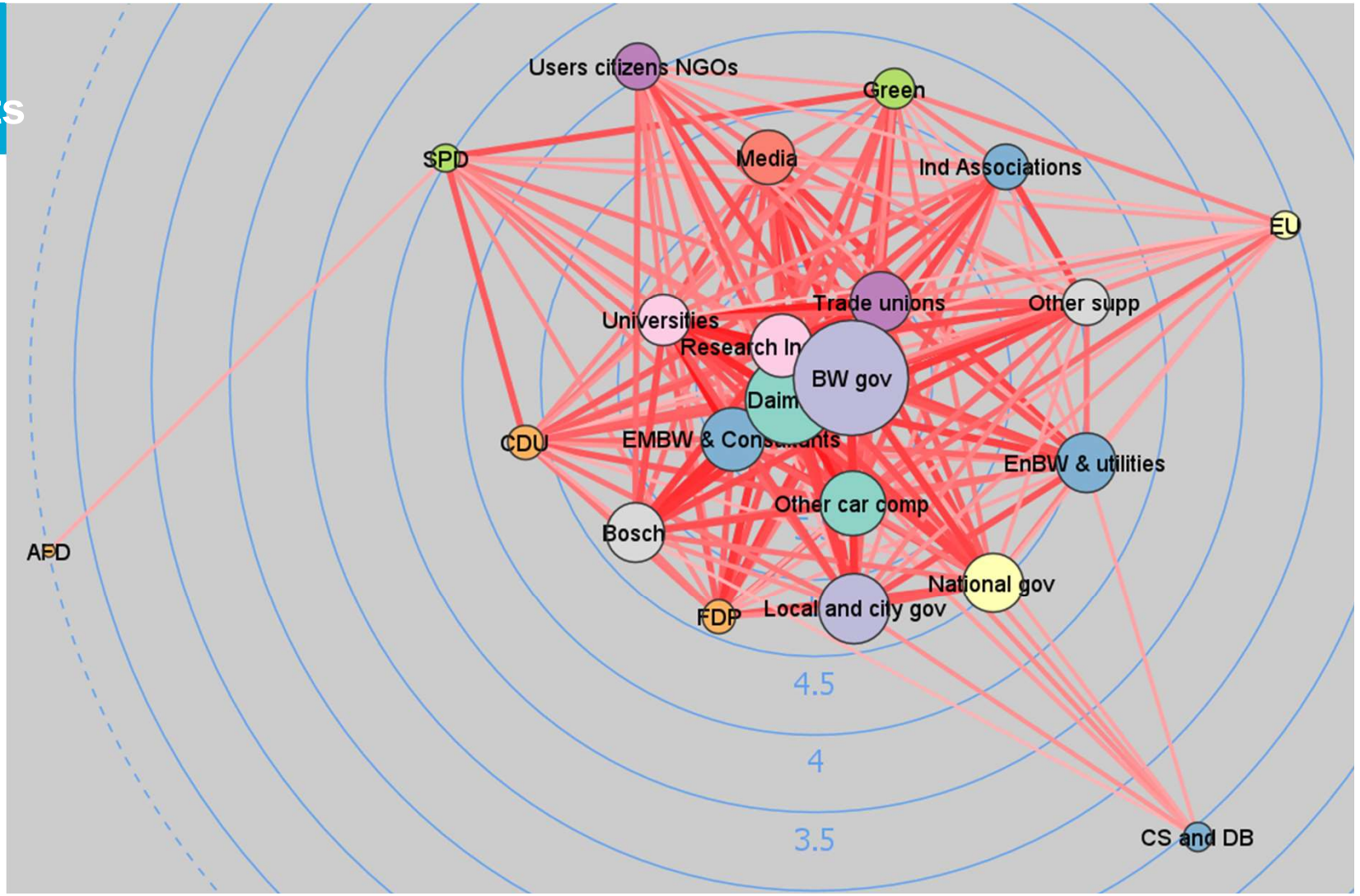
4. Results

OMA 2010-2023 (centr rad; cosine; 0.4)



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5. Lessons from the case

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- Analysis: added value of the configurational approach
  - Empirics: Where did it enable deeper insight into the case
    - Cycle from denial to experimentation to acceptance of the transition challenge
    - Retrace how core topics and positions developed over time
  - Methodology: Comparison with expert interviews
    - Basic analysis is fully congruent with results from expert interviews
    - Aggregated view on how specific topics were mobilized by different actors
  - Theory: Specific conceptual insights
    - Directionality: Shifts in centrality of nodes: regional imaginaries; core technology
    - Geography of transitions: Interrelation of socio-technical and regional aspects
    - Varieties of capitalism: Rather stable positioning of actors over time in the field

→ Configurational mapping enables to retrace core dynamics in the field

5. Lessons from the case

- Methodological specificities of this case
  - Dataset: journal articles
    - Local media with a rather homogenous reporting on events
    - Search string focused on electromobility as a future option → impacts what we see and what not
    - Perhaps some overrepresentation of major actors like Daimler or the state government
    - Perhaps underrepresentation of less newsworthy events (e.g. EmBW; other technologies)
  - Case specificity
    - Rather harmonious relationship between actors → coordinated capitalism
    - Globally leading region with a rather dominant technology core (automobile) → news coverage
    - Observation period: good coverage of the coping cycle; but missing outcome of the race
  - Learnings regarding the graphical depiction of the data
    - Key role of a solid coding tree
    - Radar plot provides some stability to the comparison over time
    - Careful selection of colors improves readability of patterns
    - Systematic variation of all sorts of presentational parameters
      → See ***STCA tutorial #2*** "How to choose appropriate parameters in STCA applications"

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Thanks

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Huiwen Gong

Alexia Dubuis

Find this video and slides at *http://stca.guide*

Alongside further resources, like:

- A step-by-step guide on how to apply the method
- Key resources like R-scripts of key data transformation procedures
- *STCA tutorial* presentations introducing different aspects of the method
- *STCA showcases* with short introductions of specific application cases
- A list of publications and student master theses applying STCA
- And more…

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