Ranking local climate policy: assessing the mitigation and adaptation activities of 104 German cities

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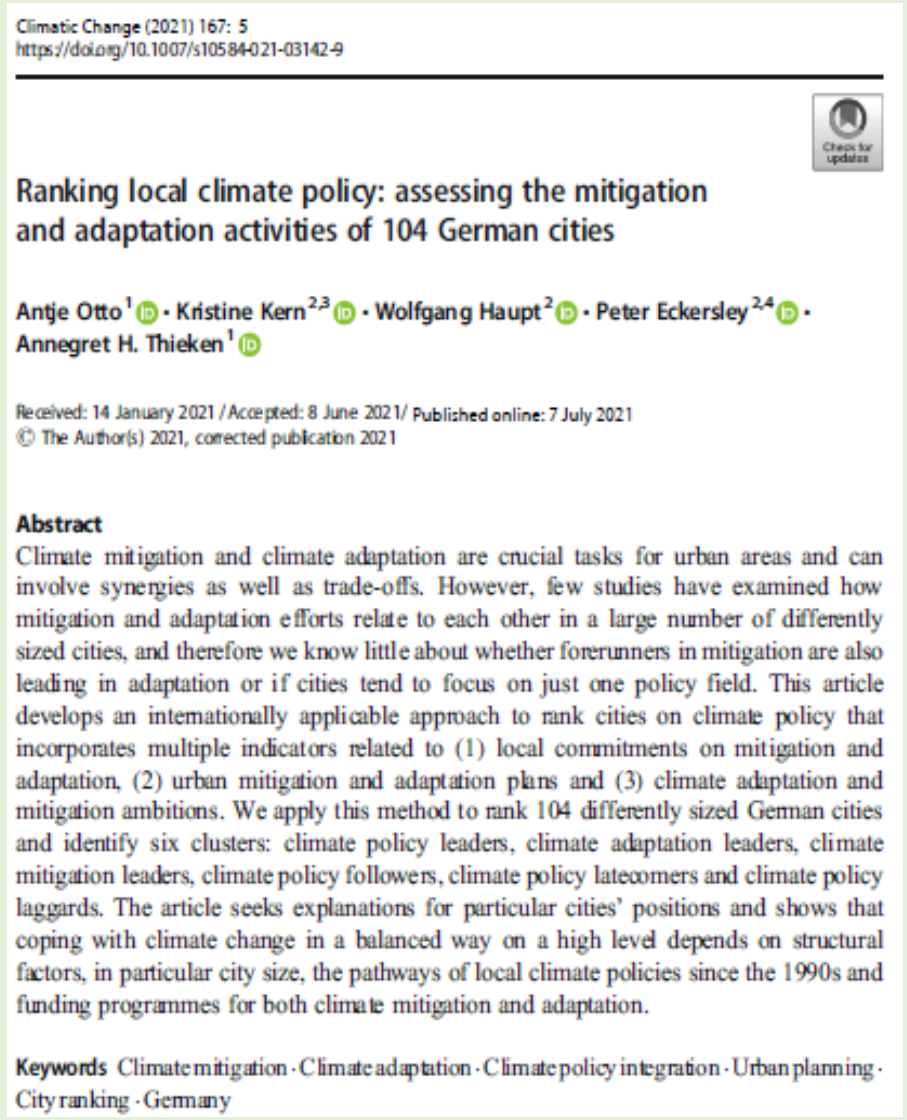
Übersicht

- (Wie) kann man die Klimaaktivitäten verschiedener Städte bewerten oder evaluieren?
- Sind die Vorreiter in Klimaschutz auch Vorreiter in der Klimaanpassung?
- Wo stehen die ‚üblichen Verdächtigen' zu den anderen?

ExTrass



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Ranking local climate policy: assessing the mitigation and adaptation activities of 104 German cities

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Abstract
Climate mitigation and climate adaptation are crucial tasks for urban areas and can involve synergies as well as trade-offs. However, few studies have examined how mitigation and adaptation efforts relate to each other in a large number of differently sized cities, and therefore we know little about whether forerunners in mitigation are also leading in adaptation or if cities tend to focus on just one policy field. This article develops an internationally applicable approach to rank cities on climate policy that incorporates multiple indicators related to (1) local commitments on mitigation and adaptation, (2) urban mitigation and adaptation plans and (3) climate adaptation and mitigation ambitions. We apply this method to rank 104 differently sized German cities and identify six clusters: climate policy leaders, climate adaptation leaders, climate mitigation leaders, climate policy followers, climate policy latecomers and climate policy laggards. The article seeks explanations for particular cities' positions and shows that coping with climate change in a balanced way on a high level depends on structural factors, in particular city size, the pathways of local climate policies since the 1990s and funding programmes for both climate mitigation and adaptation.

Keywords Climate mitigation · Climate adaptation · Climate policy integration · Urban planning · City ranking · Germany

Indikatoren

Müssen hochrelevant für Klimaschutz und –anpassung sein, ist aber problematisch…

a) Für Klimaschutz sind THG-Reduktionsziele manchmal nur symbolisch. Inwieweit werden solche Policies überhaupt ernst genommen und umgesetzt?

b) Klimarisiken sind örtlich begrenzt, und unberechenbar in ihren Ausmaß und ihrer Häufigkeit. Es ist schwierig, die Effektivität von Klimaanpassungsmaßnahmen zu bewerten, wenn keine extreme Wetterereignisse stattfinden. Und was zählt als eine Klimaanpassungsmaßnahme?

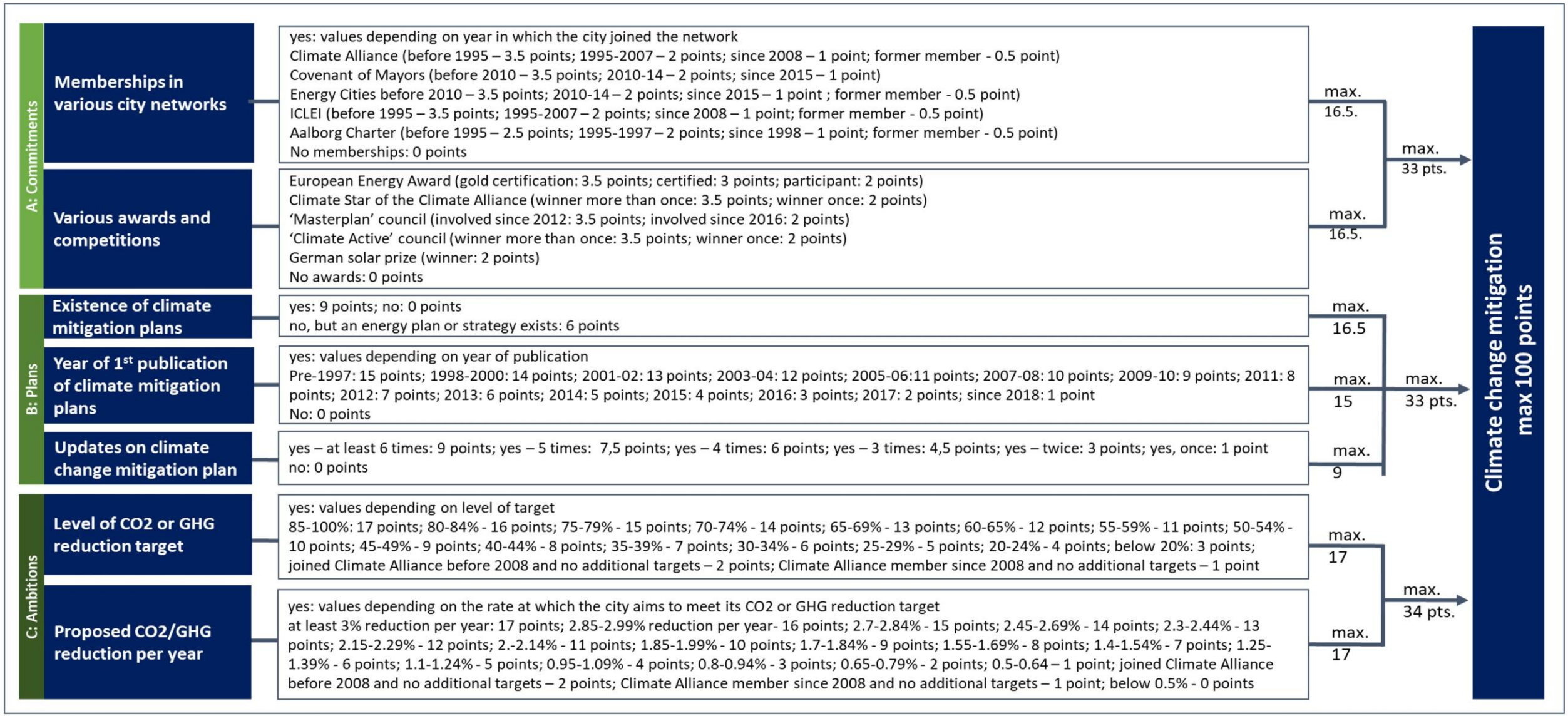
Indikatoren müssen zugänglich und vergleichbar sein

Drei Dimensionen:

a) Lokale politische Wille und Engagement (commitment)

b) Urbane Klimaschutz- und Klimaanpassungspläne

c) Ambitionen in den Bereichen Klimaanpassung und Klimaschutz


A: Commitments
Memberships in various city networks
yes: values depending on year in which the city joined the network
Climate Alliance (before 1995 – 3.5 points; 1995-2007 – 2 points; since 2008 – 1 point; former member - 0.5 point)
Covenant of Mayors (before 2010 – 3.5 points; 2010-14 – 2 points; since 2015 – 1 point)
Energy Cities before 2010 – 3.5 points; 2010-14 – 2 points; since 2015 – 1 point ; former member - 0.5 point)
ICLEI (before 1995 – 3.5 points; 1995-2007 – 2 points; since 2008 – 1 point; former member - 0.5 point)
Aalborg Charter (before 1995 – 2.5 points; 1995-1997 – 2 points; since 1998 – 1 point; former member - 0.5 point)
No memberships: 0 points
max. 16.5.
Various awards and competitions
European Energy Award (gold certification: 3.5 points; certified: 3 points; participant: 2 points)
Climate Star of the Climate Alliance (winner more than once: 3.5 points; winner once: 2 points)
'Masterplan' council (involved since 2012: 3.5 points; involved since 2016: 2 points)
'Climate Active' council (winner more than once: 3.5 points; winner once: 2 points)
German solar prize (winner: 2 points)
No awards: 0 points
max. 16.5.
max. 33 pts.
B: Plans
Existence of climate mitigation plans
yes: 9 points; no: 0 points
no, but an energy plan or strategy exists: 6 points
max. 16.5
Year of 1st publication of climate mitigation plans
yes: values depending on year of publication
Pre-1997: 15 points; 1998-2000: 14 points; 2001-02: 13 points; 2003-04: 12 points; 2005-06:11 points; 2007-08: 10 points; 2009-10: 9 points; 2011: 8 points; 2012: 7 points; 2013: 6 points; 2014: 5 points; 2015: 4 points; 2016: 3 points; 2017: 2 points; since 2018: 1 point
No: 0 points
max. 15
max. 33 pts.
Updates on climate change mitigation plan
yes – at least 6 times: 9 points; yes – 5 times: 7,5 points; yes – 4 times: 6 points; yes – 3 times: 4,5 points; yes – twice: 3 points; yes, once: 1 point
no: 0 points
max. 9
C: Ambitions
Level of CO2 or GHG reduction target
yes: values depending on level of target
85-100%: 17 points; 80-84% - 16 points; 75-79% - 15 points; 70-74% - 14 points; 65-69% - 13 points; 60-65% - 12 points; 55-59% - 11 points; 50-54% - 10 points; 45-49% - 9 points; 40-44% - 8 points; 35-39% - 7 points; 30-34% - 6 points; 25-29% - 5 points; 20-24% - 4 points; below 20%: 3 points; joined Climate Alliance before 2008 and no additional targets – 2 points; Climate Alliance member since 2008 and no additional targets – 1 point
max. 17
Proposed CO2/GHG reduction per year
yes: values depending on the rate at which the city aims to meet its CO2 or GHG reduction target
at least 3% reduction per year: 17 points; 2.85-2.99% reduction per year- 16 points; 2.7-2.84% - 15 points; 2.45-2.69% - 14 points; 2.3-2.44% - 13 points; 2.15-2.29% - 12 points; 2.-2.14% - 11 points; 1.85-1.99% - 10 points; 1.7-1.84% - 9 points; 1.55-1.69% - 8 points; 1.4-1.54% - 7 points; 1.25-1.39% - 6 points; 1.1-1.24% - 5 points; 0.95-1.09% - 4 points; 0.8-0.94% - 3 points; 0.65-0.79% - 2 points; 0.5-0.64 – 1 point; joined Climate Alliance before 2008 and no additional targets – 2 points; Climate Alliance member since 2008 and no additional targets – 1 point; below 0.5% - 0 points
max. 17
max. 34 pts.
Climate change mitigation max 100 points

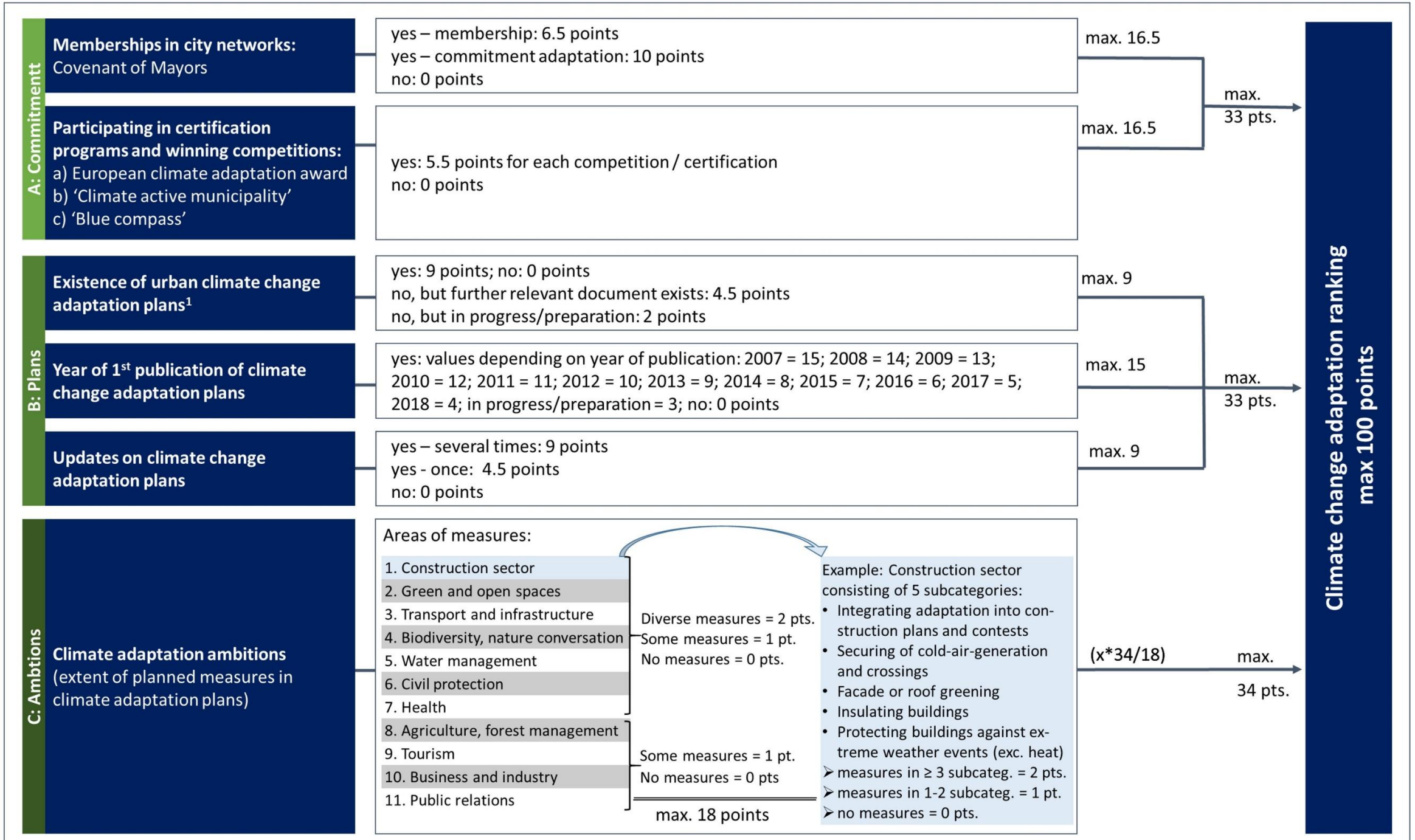

A: Commitmentt
Memberships in city networks:
Covenant of Mayors
yes – membership: 6.5 points
yes – commitment adaptation: 10 points
no: 0 points
max. 16.5
Participating in certification programs and winning competitions:
a) European climate adaptation award
b) 'Climate active municipality'
c) 'Blue compass'
yes: 5.5 points for each competition / certification
no: 0 points
max. 16.5
max. 33 pts.
B: Plans
Existence of urban climate change adaptation plans[1]
yes: 9 points; no: 0 points
no, but further relevant document exists: 4.5 points
no, but in progress/preparation: 2 points
max. 9
Year of 1st publication of climate change adaptation plans
yes: values depending on year of publication: 2007 = 15; 2008 = 14; 2009 = 13; 2010 = 12; 2011 = 11; 2012 = 10; 2013 = 9; 2014 = 8; 2015 = 7; 2016 = 6; 2017 = 5; 2018 = 4; in progress/preparation = 3; no: 0 points
max. 15
Updates on climate change adaptation plans
yes – several times: 9 points
yes - once: 4.5 points
no: 0 points
max. 9
max. 33 pts.
C: Ambtions
Climate adaptation ambitions
(extent of planned measures in climate adaptation plans)
Areas of measures:
1. Construction sector
2. Green and open spaces
3. Transport and infrastructure
4. Biodiversity, nature conversation
5. Water management
6. Civil protection
7. Health
Diverse measures = 2 pts.
Some measures = 1 pt.
No measures = 0 pts.
8. Agriculture, forest management
9. Tourism
10. Business and industry
11. Public relations
Some measures = 1 pt.
No measures = 0 pts
max. 18 points
Example: Construction sector consisting of 5 subcategories:
• Integrating adaptation into construction plans and contests
• Securing of cold-air-generation and crossings
• Facade or roof greening
• Insulating buildings
• Protecting buildings against extreme weather events (exc. heat)
➢ measures in ≥ 3 subcateg. = 2 pts.
➢ measures in 1-2 subcateg. = 1 pt.
➢ no measures = 0 pts.
(x*34/18)
max. 34 pts.
Climate change adaptation ranking
max 100 points

Table 1 City sample

Group of cities	Characterization according to BBSR (2017)	Number of cities (as of 31 Dec. 2017)	Share of total German population (as of 31 Dec. 2017)[1]
Big city	• Minimum of 500,000 inhabitants • Including the three cities with functions of federal states (Berlin, Hamburg, Bremen)	14	17 %
Medium-sized city	• Minimum of 100,000 inhabitants	66	15 %
Small independent city	• Minimum of 50,000 inhabitants • Independent from any county	24	2 %[2]
Total		**104**	**34 %**

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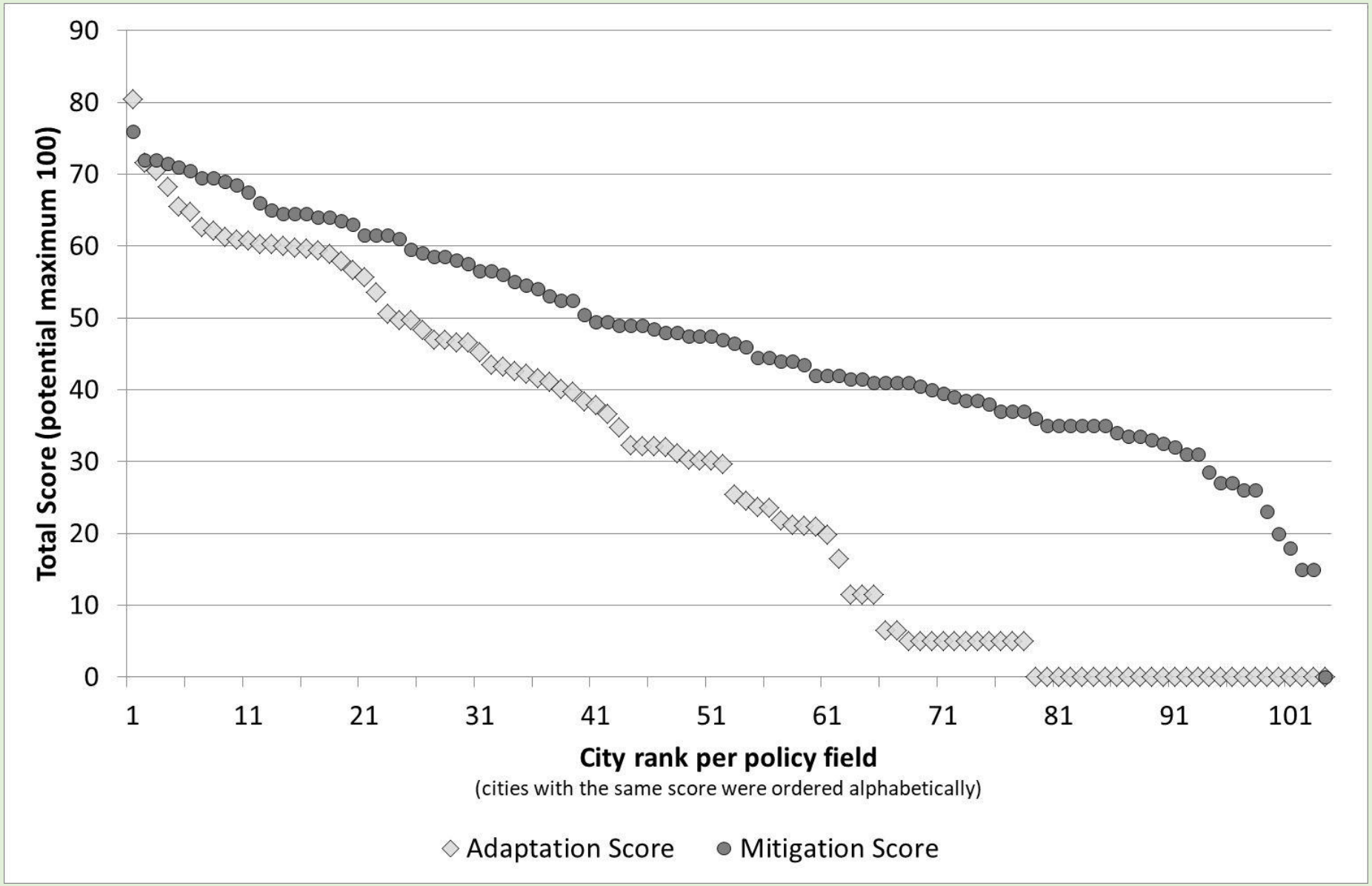

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Klimaschutz-Tabelle

Rank	City	City type	Number of inhabitants (as of 31 Dec 2017)	Mitigation score
1	Freiburg	Medium	229,636	76.0
2	Bonn	Medium	325,490	72.0
2	Münster	Medium	313,559	72.0
4	Stuttgart	Big	632,743	71.5
5	Mainz	Medium	215,110	71.0
6	Bremen	Big	568,006	70.5
7	Frankfurt (Main)	Big	746,878	69.5
7	Hannover	Big	535,061	69.5
9	Heidelberg	Medium	160,601	69.0
10	Berlin	Big	3,613,495	68.5
11	Rostock	Medium	208,409	67.5
12	Bottrop	Medium	117,364	66.0
13	Nuremberg	Big	515,201	65.0
14	Bielefeld	Medium	332,552	64.5
14	Essen	Big	583,393	64.5
14	Kiel	Medium	247,943	64.5
17	Kaiserslautern	Small independent	99,684	64.0
17	Ulm	Medium	125,596	64.0
19	Munich	Big	1,456,039	63.5
20	Emden	Small independent	50,607	63.0

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Klimaanpassungs-Tabelle

Rank	City	City type	Number of inhabitants (as of 31 Dec 2017)	Adaptation score
1	Berlin	Big	3,613,495	80.5
2	Karlsruhe	Medium	311,919	71.6
3	Hamburg	Big	1,830,584	70.4
4	Frankfurt (Main)	Big	746,878	68.2
5	Stuttgart	Big	632,743	65.6
6	Dresden	Big	551,072	64.7
7	Oberhausen	Medium	211,422	62.7
8	Cologne	Big	1,080,394	62.1
9	Essen	Big	583,393	61.3
10	Rostock	Medium	208,409	60.9
11	Münster	Medium	313,559	60.8
12	Offenbach	Medium	126,658	60.3
13	Bremen	Big	568,006	60.2
14	Hannover	Big	535,061	60.1
15	Aachen	Medium	246,272	59.8
16	Munich	Big	1,456,039	59.7
17	Duisburg	Medium	498,110	59.4
18	Nuremberg	Big	515,201	58.9
19	Worms	Small independent	83,081	57.9
20	Jena	Medium	111,099	56.6

Clusteranalyse

Clu	Number of cities	Average number of inhabitants as of 31 Dec 2017	Average total score on mitigation	Average total score on adaptation	Brief characterization
1	14	859,109	66.3	61.1	Very high scores on mitigation and adaptation: balanced approaches on a very high level *(climate policy leaders)*
2	20	309,114	50.1	51.0	High scores on mitigation and (very) high scores on adaptation: balanced approaches on a high level *(climate adaptation leaders)*
3	9	173,111	66.2	13.4	Very high scores on mitigation and relatively low scores on adaptation: unbalanced approaches *(climate mitigation leaders)*
4	23	168,909	44.7	34.6	Medium scores on mitigation and adaptation: (relatively) balanced approaches on a medium level *(climate policy followers)*
5	24	125,042	39.9	1.7	Low scores on mitigation commitments and (almost) no action in adaptation: unbalanced approaches *(climate policy latecomers)*
6	14	104,803	25.9	3.7	Low scores on mitigation commitments and mitigation ambitions and (almost) no action in adaptation: unbalanced approaches *(climate policy laggards)*
All	104	270,394	46.9	27.7	

Fazit

- Unser Rankingsystem ist nicht perfekt, die üblichen Verdächtigen sind aber meistens in der ersten Liga
- Klimaanpassungsvorreiter sind nicht immer Klimaschutzvorreiter (und umgekehrt)
- Größere und wohlhabendere Städte bekommen meistens mehr Punkte als kleinere und ärmere Kommunen (Salvia et al 2021)
- Fördermittel und externe Beratung können helfen, kleinere Städte nachzuholen
- Pfadabhängigkeit der lokalen Klimapolitik (Freiburg, Muenster, Heidelberg)
- Cut-off date: Dezember 2018, vor Greta Thunberg und vor Covid-19. Wir werden das Ranking ab 2022 aktualisieren