Global climate action from cities, regions, and businesses

Taking stock of the impact of individual actors and cooperative initiatives on global greenhouse gas emissions. 2021 edition

Technical annex II: Methodology for quantifying the potential impact of international cooperative initiatives

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1. Selection of international cooperative initiatives

The list of 297 international cooperative initiatives (ICIs) is sorted alphabetically, organised by Initiative Name, Main Climate Policy Focus (mitigation, adaptation, mixed, other), and Marrakesh Partnership thematic area (land use, water, oceans and coastal zones, energy, industry, human settlements, transport) **Error! Reference source not found.**. List of international cooperative initiatives (ICIs) considered in the analysis

Table 1: List of international cooperative initiatives (ICIs) considered in the analysis (Chan *et al.*, 2021)

No.	Name	Main Climate Policy	Marrakech Partnership Thematic Area
1	100 Resilient Cities	mixed	human settlements
2	100% RE Cities and Regions Network (under ICLEI)	mitigation	energy
3	2050 Pathways Platform	mitigation	human settlements, industry
4	4/1000 Initiative: Soils for Food Security and Climate	mixed	land use
5	A commitment to reduce ocean noise pollution	other	oceans and coastal zones, industry
6	Accelerating renewable energy transition in SIDS	mitigation	energy, policy
7	Act4nature International	mixed	land use, industry
8	Action towards Climate-Friendly Transport	mitigation	transport
9	Adaptation for Smallholder Agriculture Programme	mixed	land use, water, human settlements, energy
10	Advancing Towards Zero Waste Declaration	mitigation	human settlements
11	Africa Adaptation Initiative	adaptation	other
12	Africa Clean Energy Corridor	mitigation	energy
13	Africa Climate-Smart Agriculture Alliance	mixed	land use
14	Africa Renewable Energy Initiative	mitigation	energy
15	African Women in Agricultural Research and Development - One Planet Fellowship	adaptation	land use
16	African Youth Climate Hub	mixed	other
17	AfroChampions Initiative	adaptation	industry, finance
18	Airport Carbon Accreditation	mitigation	transport, energy
19	Alliances for Climate Action	mixed	energy, industry
20	Annual Disclosure	mitigation	human settlements, energy
21	APRU network of experts, future leaders and policy makers addressing the health of the Pacific Ocean and its marine and coastal resources	mixed	oceans and coastal zones
22	Asian Seafood Improvement Collaborative	other	oceans and coastal zones
23	Assessing Low Carbon Transition	mitigation	transport, industry
24	Banking Environment Initiative	mitigation	other
25	BioCarbon Fund Initiative for Sustainable Forest Landscapes	mitigation	land use
26	Biodiversity Facility of Agence Francaise Developpement, WWF and IUCN	other	land use
27	Blue Carbon Code of Conduct	mixed	oceans and coastal zones
28	Blue Carbon Initiaitive	mixed	oceans and coastal zones
29	Blue Forests Project	mitigation	land use, oceans and coastal zones
30	Blue Growth Initiative	mixed	oceans and coastal zones
31	Bonn Challenge	mitigation	land use
32	Brazilian Business Commitment for Biodiversity	mitigation	industry
33	Breakthrough Energy Coalition	mitigation	land use, transport, energy, industry

No.	Name	Main Climate Policy	Marrakech Partnership Thematic Area
34	Building Climate Resilience for the Urban Poor	adaptation	human settlements
35	Building Resilience in the Central American Region - AFOLU sector	mitigation	land use
36	Business Alliance for Water and Climate	mixed	land use, water
37	Business Ambition for 1.5 °C – Our Only Future	mitigation	energy, industry
38	Business For Nature Coalition	mixed	land use
39	C40 Cities Clean Bus Declaration	mitigation	transport, energy
40	C40 Cities Climate Leadership Group	mixed	water, transport, energy
41	C40 Divest/Invest Forum	mitigation	other
42	C40 Green & Healthy Streets	mitigation	human settlements, transport
43	Call for Action on Adaptation and Resilience	adaptation	land use, oceans and coastal zones, human settlements
44	Cancun Business and Biodiversity Pledge	other	industry
45	Carbon Capture and Storage	mitigation	energy, industry
46	Carbon Neutral Cities Alliance	mitigation	human settlements, energy
47	Carbon Neutrality Coalition	mitigation	energy
48	Carbon Pricing Leadership Coalition	mitigation	other
49	Caribbean Challenge Initiative	mixed	land use, oceans and coastal zones
50	Caribbean Climate-Smart Accelerator	mixed	oceans and coastal zones, energy
51	Caring For Climate	mitigation	energy
52	Catalytic Finance Initiative	mitigation	energy
53	CCAC Agriculture Initiative	mitigation	land use
54	CCAC: Phasing Down Climate Potent HFCs	mitigation	human settlements, energy, industry
55	Central African Forest Initiative	mitigation	land use, human settlements
56	Chamber Climate Coalition	mitigation	industry
57	Circular Cars Initiative	mitigation	transport
58	Cities and Regions' Five year Vision	mixed	human settlements, transport, energy
59	Cities Climate Finance Leadership Alliance	mixed	human settlements, Infrastructure
60	Clean Air Fund	mitigation	human settlements
61	Clean Air Initiative	mitigation	human settlements
62	Clean Climate & Air Coalition	mitigation	industry
63	Clean Cooking Fund	mitigation	energy
64	Clean Jobs Initiative	mixed	industry
65	Climate Action 100+ Coalition	mitigation	industry
66	Climate Action Pacific Partnership	mixed	land use, oceans and coastal zones, water, energy
67	Climate Ambition Alliance: Net Zero 2050	mitigation	human settlements, transport, energy, industry
68	Climate Bonds Initiative	mixed	energy, industry
69	Climate change and health in small island developing states	adaptation	health
70	Climate Change and Security	adaptation	human settlements
71	Climate Finance Partnership	mitigation	human settlements, transport, energy, industry
72	Climate Investment Platform	mitigation	energy
73	Climate Land Ambition and Rights Alliance	adaptation	land use, human settlements
74	Climate Risk Early Warning Systems	adaptation	land use, oceans and coastal zones, water
75	Climate-Smart Agriculture Booster	mixed	land use
76	CO2 Performance Ladder	mitigation	energy, industry
77	Coalition for Climate Resilient Investment	adaptation	other

No.	Name	Main Climate Policy	Marrakech Partnership Thematic Area
78	Coalition of Finance Ministers for Climate Action	mitigation	energy
79	Coaliton for Sustainable Energy Access	adaptation	energy
80	Coconut Industry Development for the Caribbean	adaptation	land use
81	Coffee & Climate	adaptation	land use
82	Collaborative Climate Action Across the Air Transport World	mitigation	transport
83	Conference of Peripheral Maritime Regions	mixed	oceans and coastal zones, transport, energy
84	Cool Coalition	mixed	human settlements, energy
85	Debt swap	adaptation	human settlements
86	Decarbonizing Shipping: Getting to Zero Coalition	mitigation	transport, industry
87	Desert to Power Mission	mitigation	energy
88	DeSIRA - Financing for agricultural research to help low-income farmers adapt to climate change	adaptation	land use, water
89	Divest-Invest Global Movement	mitigation	other
90	Early Warning Early Action	adaptation	land use
91	Earth For Life Initiative	mixed	other
92	Earth Optimism	other	land use, oceans and coastal zones, human settlements, transport, energy, industry
93	East Africa Regional Power Trade	mitigation	energy
94	ECCA30	mitigation	land use
95	Energy Sector Management and Assistance Program	mitigation	energy
96	Enhancing global ocean acidification monitoring and research	adaptation	oceans and coastal zones
97	EP100	mitigation	energy, industry
98	EU 2020 Task Force on Nature-Based Solutions for Hydro-meteorological Risk Reduction	adaptation	land use, oceans and coastal zones, water, human settlements, energy
99	European Technology and Innovation Platform for Photovoltaics	mitigation	energy
100	European Technology and Innovation Platform on Wind Energy	mitigation	energy
101	EV100	mitigation	transport, energy
102	EverGreen Agriculture Partnership	mixed	land use
103	Fashion Industry Charter for Climate Action	mitigation	industry
104	Fiji Water Resilience	adaptation	water
105	Food Security Climate Resilience Facility	adaptation	land use
106	Global Alliance for Buildings and Construction	mitigation	human settlements, energy
107	Global Alliance for Climate-Smart Agriculture	mixed	land use, industry
108	Global Alliance for Smart Cities in Africa	mixed	human settlements, energy
109	Global Alliance for Water and Climate's Incubation Platform	adaptation	water
110	Global Alliance to Significantly Reduce Methane Emissions in the Oil and Gas Sector by 2030	mitigation	energy, industry
111	Global Campaign for Nature	mixed	other
112	Global Covenant of Mayors for Climate & Energy	mixed	water, human settlements, transport, energy, industry
113	Global Facility for Disaster Reduction and Recovery	adaptation	land use, oceans and coastal zones, human settlements, transport

No.	Name	Main Climate Policy	Marrakech Partnership Thematic Area
114	Global Fuel Economy Initiative	mitigation	transport, energy
115	Global Geothermal Alliance	mitigation	energy
116	Global Green Bond Partnership	mixed	other
117	Global Green Freight Action Plan	mitigation	transport
118	Global Initiative for Resource-Efficient Cities	mixed	human settlements
119	Global Investor Coalition on Climate Change	mitigation	industry, investment
120	Global Lighting Challenge	mitigation	energy
121	Global Mangrove Alliance	adaptation	oceans and coastal zones
122	Global Partnership for Plant Conservation	other	land use, oceans and coastal zones, water
123	Global Plastic Action Partnership	mitigation	oceans and coastal zones
124	Global Research Alliance on Agricultural Greenhouse Gases	mitigation	land use
125	Global Resilience Partnership	adaptation	land use, oceans and coastal zones, water, human settlements
126	Global Sidewalk Challenge	mitigation	human settlements, transport
127	Global Urbis	mixed	human settlements
128	Goal 14 implementation for the protection of Mediterranean Sea's whales and dolphins	adaptation	oceans and coastal zones
129	Governors' Climate and Forests Task Force	mitigation	land use
130	Great Green Wall for Sahara and the Sahel Initiative	mixed	land use
131	Green Bond Pledge	mixed	other
132	Green Building Initiative	mitigation	human settlements, energy
133	Helping Farmers Cope with Climate Change	adaptation	land use
134	High-level Panel for a Sustainable Ocean Economy	mitigation	oceans and coastal zones
135	Hydrogen Initiative	mitigation	transport, energy
136	ICT4SIDS Partnerships: Rapid Implementation of SDGs Through Latest Digital Innovations	mixed	land use, oceans and coastal zones, human settlements
137	IFDC/VFRC: Yield, Income and Climate Gains Through Smart Rice Fertilization	mixed	land use
138	Important Plant Areas in Arabia	mixed	land use
139	Increasing Capacities to develop National Species Checklists in the Latin America and the Caribbean Region	other	land use
140	Initiative for Sustainable Cities Development in Africa (ISCDA)	mitigation	land use, human settlements
141	Initiative on Gender and Climate Change	mixed	human settlements
142	Initiative on Protection of Cultural and Natural Heritage from Climate Change	adaptation	land use
143	InsuResilience Global Partnership	adaptation	human settlements, industry
144	Integrated Coastal Management	mixed	oceans and coastal zones
145	International Alliance to Combat Ocean Acidification	adaptation	oceans and coastal zones
146	International Partnership for Blue Carbon	mixed	oceans and coastal zones
147	International Solar Alliance	mitigation	energy
148	International Waste Platform	mixed	oceans and coastal zones
149	International Zero-Emission Vehicle Alliance	mitigation	transport
150	Just Transition Initiative	adaptation	industry
151	Kwon-Gesh Youth Pledge	mixed	human settlements
152	Land Degradation Neutrality Fund	mixed	land use
153	LDC Energy Access Accelerator	mixed	energy
154	LDC Initiative for Effective Adaptation and Resilience	adaptation	human settlements

No.	Name	Main Climate Policy	Marrakech Partnership Thematic Area
155	Leaders' Pledge for Nature	mitigation	land use, oceans and coastal zones, water, human settlements, industry
156	Leadership for Urban Climate Investment	mixed	human settlements
157	Leadership Group for Industry Transition	mitigation	industry
158	Lean and Green	mitigation	transport
159	Life Beef Carbon	mitigation	land use, industry
160	Low Carbon Investment Registry	mitigation	other
161	Low Carbon Rail Transport Challenge	mitigation	transport, energy
162	Make Our Planet Great Again	mixed	other
163	MAR Fund	adaptation	oceans and coastal zones
164	Marine Global Earth Observatory MarineGeo	mixed	oceans and coastal zones
165	MedFish4ever	other	oceans and coastal zones
166	Megacities Alliance for Water and Climate	adaptation	water, human settlements
167	Mission Innovation	mitigation	transport, energy, industry
168	Mission Possible Platform	mitigation	transport, energy, industry
169	Mitigating SLCPs from the Municipal Solid Waste Sector	mitigation	human settlements
170	MobiliseYourCity Partnership	mitigation	human settlements, transport
171	Montréal Carbon Pledge	mitigation	other
172	Movin´on	mitigation	transport
173	National Agricultural Resilience Framework	adaptation	land use
174	Natural Capital Lab	other	other
175	Nature4Climate	mixed	land use, oceans and coastal zones, water
176	Nature-Based Solutions	adaptation	land use, water, human settlements
177	Navigating a Changing Climate	mixed	transport, energy, industry
178	Network for Greening the Financial System	mixed	other
179	Network of Financial Centres for Sustainability	mitigation	other
180	Net-Zero 2050 Team	mixed	energy
181	North American Climate Smart Agriculture Alliance	adaptation	land use
182	Norway-Pacific Joint Chair of Oceans and Climate Change	mixed	oceans and coastal zones
183	Ocean Risk and Resilience Action Alliance	adaptation	oceans and coastal zones, water
184	Oceania 21	mixed	oceans and coastal zones
185	Oceanic Blue Carbon	mitigation	oceans and coastal zones
186	Oil & Gas Methane Partnership	mitigation	industry
187	Oil and Gas Climate Initiative	mitigation	transport, energy, industry
188	One Planet Business for Biodiversity	mitigation	land use, industry
189	One Planet Sovereign Wealth Funds	mixed	other
190	Pacific Climate Finance and Insurance Incubator	mixed	other
191	Pacific Initiative on Biodiversity, Resilience and Climate Change	adaptation	oceans and coastal zones
192	Pacific plastic pollution: A system for regional grassrots	adaptation	oceans and coastal zones
193	Paris Aligned Investment Initiative	mitigation	other
194	Paris Collaborative on Green Budgeting	mixed	other
195	Paris Pact on water and adaptation to climate change in the basins of rivers, lakes and aquifers	adaptation	water
196	Partnership for Carbon Accounting Financials	mitigation	industry

No.	Name	Main Climate Policy	Marrakech Partnership Thematic Area
197	Partnership with African Coastal States to Eradicate IUU Fishing in their Sovereign Waters by 2020	other	oceans and coastal zones
198	Planners for Climate Action	mixed	human settlements
199	Playing for the Planet	mitigation	industry
200	Portfolio Decarbonization Coalition	mitigation	industry
201	Powering Past Coal Alliance	mitigation	energy
202	Principles for Responsible Investment	mitigation	industry
203	Promoting Biodiversity Research For Public And Private Decision Support	mixed	other
204	Promoting Disaster and Climate Risk Resilience Through Regional Programmatic and Risk Financing Mechanisms	adaptation	other
205	Protecting 1 million sq kms through the $15 million WCS Marine Protected Area Fund	adaptation	oceans and coastal zones
206	Protection of 400 Million Hectares of Forest	mitigation	land use
207	Public Transport Declaration on Climate Leadership (UITP)	mitigation	transport
208	Put a Price on Carbon: Business leadership criteria on carbon pricing	mitigation	energy, industry
209	R4 Rural Resilience Initiative	adaptation	land use
210	Raise Awareness about the Ocean and Take Action	mixed	oceans and coastal zones
211	RE100	mitigation	energy
212	Reducing ship strikes to vulnerable Whales	other	oceans and coastal zones
213	Refrigerants, Naturally!	mitigation	energy, industry
214	Regional Electric Vehicle Plan for the West	mitigation	transport, energy
215	Remove Commodity-driven Deforestation	mitigation	land use
216	Renewable Energy Solution for Rural Communities	mixed	energy
217	Resilience Intel	mixed	other
218	Resilient Cities Acceleration Initiative	mixed	human settlements
219	RE-Source Platform	mitigation	energy
220	Responsible Care	mitigation	industry
221	Responsible corporate engagement in climate policy	mitigation	industry
222	Responsible Steel	mixed	industry
223	Risk-informed Early Action Partership	adaptation	human settlements
224	Salud sin daño / Health Care Without Harm	mitigation	other
225	Save Food Initiative	mitigation	land use, industry
226	Science-based Targets	mitigation	transport, energy, industry
227	SE4all: People-Centered Accelerator	mitigation	human settlements, energy
228	SE4All: United for Efficiency	mitigation	energy, industry
229	SEforAll: Building Efficiency Accelerator	mitigation	human settlements, energy, industry
230	SEforAll: Global Energy Efficiency Accelerator Platform	mitigation	energy
231	SEforAll: Industrial Energy Efficiency Accelerator	mitigation	energy, industry
232	SIDS 2020 Ambition Leadership Coalition	mitigation	energy
233	SIDS Lighthouses Initiative	mitigation	energy
234	Small Island States (SIDS) Blue Guardians: Partnership to Protecting Oceans and Climate-resilient Blue Economies	mixed	oceans and coastal zones
235	Smart Risk Investing	adaptation	industry
236	Space Climate Observatory	mixed	other
237	Sports for Climate Action	mixed	other

No.	Name	Main Climate Policy	Marrakech Partnership Thematic Area
238	Statement by Finiancial Institutions on Energy Efficiency Finance	mitigation	energy
239	Statement of Support for the Cerrado Manifesto	mitigation	land use, industry
240	Stichting Partnership on Sustainable, Low Carbon Transport	mixed	transport, energy
241	Sub-national Climate Fund Africa	mitigation	energy
242	SunShot Initiative	mitigation	energy
243	Super-efficient Equipment and Appliance Deployment Initiative	mitigation	energy
244	Support for coal- and carbon-intensive regions in transition	mixed	energy, industry
245	Supporting smallholder farmers	adaptation	land use, human settlements
246	Sustainable Building and Climate Initiative	mitigation	energy, industry
247	Task Force for Clean Energy Transition on accelerating energy transition from coal to cleanv	mitigation	energy
248	Task Force on Climate-Related Financial Disclosure	mixed	industry
249	Taxis4SmartCities	mitigation	transport
250	Technical assistance on issues related to market access and trade-related aspects	other	oceans and coastal zones
251	TED Countdown	mixed	other
252	The 1 in 100 initiative	adaptation	other
253	The 10x20 Initiative	mixed	oceans and coastal zones
254	The 2030 Challenge	mitigation	human settlements, energy
255	The Climate Pledge	mitigation	energy
256	The Climate Registry	mixed	energy, industry
257	The Climate Smart Agriculture Youth Network /CSA Youth Group: Mainstreaming Youth and Persons Living with Disabilities in Climate-Smart Agriculture)	mixed	land use
258	The Global Forum on Agriculture Research (GFAR)	adaptation	land use
259	The Inevitable Policy Response	mixed	other
260	The Investor Agenda	mitigation	energy
261	The Lion's Share	mixed	land use
262	The Net Zero Carbon Buildings Commitment	mitigation	human settlements
263	The New York Declaration on Forests	mitigation	land use
264	The Ocean Cleanup	other	oceans and coastal zones
265	The Ocean Pathway	mixed	oceans and coastal zones
266	The One Planet Lab	mixed	land use, oceans and coastal zones, water, transport, industry
267	The Step Up Declaration	mitigation	land use, transport, energy, industry
268	The Sub-national Climate Fund for Islands and Coastal Regions	mixed	oceans and coastal zones
269	The Sustainable Finance Facilities	mixed	energy, finance
270	The Three Percent Club for Energy Efficiency	mitigation	transport, energy
271	The Water, Peace, and Security Partnership	mixed	water, human settlements
272	The World Team Project: Sustainable Solutions Oceans Opportunities & Small Island States	adaptation	oceans and coastal zones
273	Threatened Mammals Conservation in Serra Do Mar	other	land use, industry

No.	Name	Main Climate Policy	Marrakech Partnership Thematic Area
274	Tony de Brum Declaration	mitigation	oceans and coastal zones, transport
275	Towards A Cleaner Electricity in Latin America	mitigation	energy
276	Towards an ecologically representative and efficiently managed network of Mediterranean Marine Protected Areas	mixed	oceans and coastal zones
277	Transformative Actions Program	mixed	human settlements
278	Transformative Urban Mobility Initiative	mitigation	transport, energy
279	Transition Pathway Initiative	mitigation	other
280	Transport Decarbonisation Alliance	mitigation	transport
281	Tropical Landscape Financing Facility	mixed	land use, energy
282	Under2 Coalition	mitigation	human settlements, transport, energy
283	United Nations-convened Net-Zero Asset Owner Alliance	mitigation	other
284	Urban Electric Mobility Initiative	mitigation	transport
285	Urban-LEDS project	mixed	human settlements
286	Value Chain Risk to Resilience	adaptation	industry
287	Waste Management and Sanitation Improvement (WMI) Programme	mixed	oceans and coastal zones, human settlements
288	We Mean Business Coalition	mitigation	industry
289	West Africa Coastal Areas Management Program	adaptation	land use, oceans and coastal zones
290	Wind Vision	mitigation	energy
291	World Bank: Scaling up CSA for Impact	mixed	land use, agriculture
292	World Flora Online	other	land use
293	World Ports Sustainability Program	mitigation	transport
294	WWF Climate Savers	mitigation	transport, energy, industry
295	Zero Carbon Buildings for All	mitigation	human settlements, energy
296	Zero Deforestation Commitments by Commodity Producers and Traders	mitigation	land use
297	Zero Routine Flaring by 2030	mitigation	energy

2. Quantification of potential GHG emissions reduction impact by international cooperative initiatives

2.1 Emission reduction potential of electricity savings

For several ICIs, we quantified electricity-related savings. These originate from implementation of renewable electricity (RE), therefore replacing fossil-based power, or the implementation of efficiency measures, therefore reducing the demand for fossil-based power. We translated these electricity savings to an emission reduction potential by multiplying the savings with country-specific electricity emission factors.

We determined the emission factors of coal-fired power and gas-fired power using the IEA's WEO 2019 projections (IEA, 2019). The emission factors are given by the CO_2 emissions from fuel-specific power generation over the total fuel-specific electricity generation. For Canada, Mexico and Indonesia, we used the fuel-specific emission factors provided by the Energy Demand and Supply Outlook of the Asia Pacific Economic Cooperation (APERC, 2019). To obtain a range in results, we applied the emission factors of coal-fired power for a maximum emission reduction potential and the emission factors of gas-fired power for the minimum emission reduction potential.

2.2 Energy Efficiency

2.2.1 Industrial Energy Accelerator

Description

The SE4All's Industrial Energy Accelerator (SE4All-IEA) works to facilitate industrial energy efficiency on a global scale. The SE4All-IEA is currently active in twelve countries, which together account for approximately 35% of the global energy consumption. The initiative provides companies of all sizes with the know-how on a range of interventions which include equipment upgrades and improved energy management systems. SE4All-IEA stated that industrial companies can reduce their energy use by up to 15% by implementing these measures (SE4All Industrial Energy Accelerator, 2021).

Quantification

We assumed that 2015 is the start year of SE4All-IEA. Industrial energy efficiency is projected to improve by approximately 1% annually by default (Blok, 2004; UNIDO, 2010). Based on this, the SE4All-IEA target translates to an additional 1.01% efficiency improvement by 2030 compared to the default energy efficiency improvements.

For the quantification of the current membership and targets' potential, we quantified the impact of nine countries where the SE4All-IEA is active. We compared the industry electricity demand under a reference scenario to the industry electricity demand with the increased energy efficiency resulting from the SE4All-IEA. The reference scenario for Brazil, China, South Africa and India were obtained from the WEO CPS (IEA, 2019). Reference scenarios for Indonesia and Mexico were derived from the BAU scenario in the Energy Demand and Supply Outlook by the Asia Pacific Economic Cooperation (APERC, 2019). We determined the reference scenarios for Egypt, Ukraine and Morocco by applying regional industry growth rates from IEA's WEO to the countries' 2018 industry electricity demand, as provided by the IEA online data browser (IEA, 2018a, 2018b, 2018c).

We applied the additional 1.01% efficiency improvement to the country reference electricity demands, to determine the potential reduction in electricity demand. We then translated these electricity demand reductions into emission savings, as explained in Section 2.1**Error! Reference source not found.**.

For the initiative's aspirational goals scenario, we quantified a mitigation potential for all non-OECD countries. We took the same approach as for the current members, based on WEO (IEA, 2019). The difference between the current members emission reduction potential and the non-OECD emission

reduction potential was allocated to rest of the world. Malaysia, Myanmar and Palestine were excluded based on to their minor contributions to global industry emissions

2.2.2 United for Efficiency (U4E)

Description

United for Efficiency (U4E) is a global initiative supporting developing countries and emerging economies to move their markets to energy-efficient appliances and equipment. U4E builds on the success of the en.lighten initiative, which accelerates the transition to efficient lighting worldwide. It broadens the scope to six high-efficiency product categories (five for which data is provided), such as commercial, industrial and outdoor lighting, residential refrigerators, room air conditioners, electric motors, distribution transformers, and information and communication technologies. U4E focuses primarily on developing countries and emerging economies, where electricity demand is expected to more than double by 2030. The initiative claims to have the potential to achieve 1.25 $GtCO_2e$ emissions reductions annually by 2030 (U4E, 2021b).

Quantification

Annual country-specific electricity savings (in TWh) from energy-efficient appliances and equipment through the implementation of Minimum Energy Performance Standards (MEPS) were quantified by the initiative (U4E, 2021a). U4E quantified the potential electricity savings in 2030 attained from improved energy efficiency at two levels of ambition (minimum and high). The savings potential in each scenario assumes MEPS are introduced in 2020.

For the GHG emission reduction potential of current members and targets, we considered the electricity savings from both U4E and en.lighten members in 2030. We translated the country-specific electricity demand savings to GHG emission reduction potentials. For this, we multiplied the country-specific electricity savings with the country-specific electricity emission factors, see Section XXX. For countries beyond the ten major emitting economies under analysis, we applied electricity emission factors Africa and Central and South America, if possible. For all the remaining countries we used electricity emission factors from the global non-OECD countries were used.

For the aspirational goals scenario, we used U4E's aspirational global mitigation potential of 1.25 $GtCO_2e$ for 2030. For the lower range of this potential impact, we applied the average difference between maximum and minimum ambition as provided in the U4E country assessments. Canada, EU-27+UK, Japan and the US are not considered in the quantification, given U4E's focus on developing and emerging regions. The difference between the global potential and the sum of the potential of the ten major emitting regions is allocated to the rest of the world.

2.2.3 Results

Table 2: Global emission reduction potential from energy efficiency ICIs

Initiative	Global GHG emission reduction potential of current members in 2030	Global aspirational GHG emission reduction potential of in 2030
U4E	75 - 192 $MtCO_2e$	546 – 1,641 $MtCO_2e$
IEA	25 - 60 $MtCO_2e$	40 - 76 MtCO2e

2.3 Buildings

2.3.1 Architecture 2030

Description

The mission of Architecture 2030 (A2030) is to expedite the global low-carbon transition of the buildings sector, targeting energy efficiency improvements in the building envelope. A2030 pursues two main

objectives: 1) to achieve substantial reductions in GHG emissions from the built environment and 2) to enhance the development of sustainable buildings and communities. In 2006, A2030 launched the 2030 Challenge, which sparked a net-zero emissions movement in the buildings sector (A2030, 2021). Since then, it has been adopted by architectural design firms, the International Union of Architects, the American Institute of Architects, cities, and the US Conference of Mayors. The 2030 Challenge entails the following targets, as stated on their website (A2030, 2019):

- All new buildings, developments and major renovations shall be designed to meet a fossil fuel, GHG-emitting, and energy consumption performance standard of 70% below the regional average for that building type.
- At a minimum, an equal amount of existing building area shall be renovated annually to meet the same target.
- The fossil fuel reduction standard shall be increased to 80% in 2020, 90% in 2025 and carbon neutral in 2030.

Quantification

We calculated the energy efficiency improvements for new floor area, rebuilt floor area and renovated floor area, which results in the reduction of fossil fuel consumption in buildings.

The sum of rebuilt, renovated and new building stock determines the amount of floor area potentially impacted by A2030. To determine the total amount of floorspace that is (re)built each year we summed:

- New floorspace, using floorspace projections from IEA (2013) and IEA and IPEEC (2015) (for Canada and Indonesia)
- Demolished and rebuilt floorspace, using demolition rates of 1.5%/year for OECD countries and 2%/year for non-OECD countries (IEA, 2016)
- Renovated floorspace, using renovation rates of 1%/year (Kriegler *et al.*, 2018)

We applied different coverage rates per region for the aspirational goals scenario and the current members and targets scenario to get an estimate of the potential amount of floor area under A2030. Currently, A2030 is mainly active in the United States and Canada and has several projects in the EU and China. Therefore, we used the following coverage rates for the current membership and targets scenario:

- US and Canada: 65% in 2017 and 90% in 2050
- EU-27+UK and China: 1% in 2016 and 30% in 2050.
- Rest of the world: stay constant at 1%

For the coverage under the aspirational goals scenario, we used the following coverage rates:

- US and Canada: 65% in 2017 and 100% in 2050 (A2030 will reach its target of full coverage in the US and Canada).
- EU-27+UK and China: 1% in 2016 and 50% in 2050
- Rest of the world: 1% in 2017 and 5% in 2050.

The trajectory of current coverage to target coverage is assumed to grow linearly in Canada and the US, as the initiative is already mature in these countries. For the EU and China, we assumed a logistic growth curve. Based on the current low number of projects in these regions, we assume that technology implementation will gain momentum once a critical mass is reached to develop broadly in the sector. For the rest of the world, we assumed linear growth, based on the assumption that some additional projects will be executed in the rest of the world with a steady rate.

We obtained the energy consumption and emissions data per fuel type from IEA's WEO 2019 CPS (IEA, 2019) and APEC Energy Demand and Supply Outlook (APERC, 2019). With these, we determined the CO_2 emission factors per fuel type. By combining the floorspace data with building energy demand, we calculated current and future energy intensity of buildings in mtoe/m^2. We quantified the A2030's emission reduction potential by applying its efficiency target to the energy use per unit of floor area. The minimum and maximum depends on the order of fossil fuels which were reduced under the energy

efficiency improvements. In the maximum emissions reductions' scenario, we assume that reductions come from coal first, then oil, then gas. In the minimum emissions reductions' scenario, we assume that reductions come from gas first, then oil, then coal.

2.3.2 Results

Table 3: Global emission reduction potential of buildings ICIs

Initiative	Global GHG emission reduction potential of current members and targets in 2030	Global GHG emission reduction potential of aspirational goals in 2030
Architecture 2030	163 - 200 $MtCO_2e$	250 - 313 $MtCO_2e$

2.4 Transport

2.4.1 Global Fuel Economy Initiative

Description

The Global Fuel Economy Initiative (GFEI) works to secure real improvements in fuel economy, and the maximum deployment of vehicle efficiency technologies across the world. This includes light and heavy-duty vehicles, and the full range of technologies, including hybrid and fully electric vehicles. The initiative promotes these objectives through shared analysis, advocacy, and through in country policy support, and tools.

GFEI is a partnership of the International Energy Agency (IEA), United Nations Environment Programme (UNEP), International Transport Forum of the OECD (ITF), International Council on Clean Transportation (ICCT), Institute for Transportation Studies at the University of California, Davis and the FIA Foundation, which hosts the secretariat (Global Fuel Economy Initiative, 2020).

The initiative has the two following goals:

- Improve Light Duty Vehicle fuel economy by 50% by 2030 for new vehicles, and 2050 for all vehicles (2005 baseline). Goal is expressed in litres of gasoline equivalent per 100 km for entire fleet. This target is extended to 50% reduction in new passenger vehicle kilometres CO_2 emissions relative to 2005 for 2030 and 90% for 2050. This includes a 35% sales share of electric vehicles by 2030, and 86% by 2050.
- Improve Heavy Duty Vehicle fuel consumption by 35% by 2035 for new vehicles (2015 baseline). This target is extended to a 35% reduction in new heavy-duty truck per-kilometre CO_2 emissions by 2035. This includes a 19% sales share of electric vehicles by 2035, and 66% for 2050.
- Although the GFEI assumes a significant decrease in carbon intensity of the electricity grid, we have not included this as this is covered by other initiatives.

Quantification

Quantification of the impact of the GFEI initiative used the TIMER energy model. This model is part of the integrated assessment model IMAGE 3.0 (Stehfest et al. 2014). It describes future energy demand and supply for 26 global regions (including some large countries, such as the US and China), and assesses the implications of energy system trends for all major greenhouse gases and air pollutants. This model simulates long-term energy baseline and mitigation scenarios on the global and regional levels (van Vuuren *et al.*, 2006). The investments into different energy technologies are calculated by a multinomial logit function that accounts for relative differences in costs and preferences (technologies with lower costs gain larger market shares). The model is built up from different modules, including energy demand modules for transport, industry, buildings and modules for energy supply, industrial processes and emissions.

Efficiency of new cars and trucks is an input to the TIMER transport model (Girod, Van Vuuren and Deetman, 2012), and improve with increasing energy tax that were set to the level that achieve the global GFEI targets. In our assessment, each region faces the same percent energy tax increase relative to the current national policies scenario. In addition, the electric vehicle share for new cars was enforced. As the TIMER model does not include full-electric trucks, the electric sales share target was not possible to implement for heavy trucks. However, the share of hybrid trucks sales is slightly higher than 50% after implementation of the CO_2 and fuel consumption standards.

The results for 26 IMAGE regions were scaled with the share of countries that participate in GFEI, based on the 2012 GHG emissions for road transport from the EDGAR database (Janssens-Maenhout *et al.*, 2017). Participants in the GFEI can be divided in 1) submitted baseline emissions, 2) submitted policy proposals, 3) implemented transport policies (Global Fuel Economy Initiative, 2021). For the quantification of the current membership and targets, we included all these types of members. For the quantification of GFEI's aspirational goals, we assumed global coverage.

GHG emission reductions were compared to the current national policies scenarios from Kuramochi *et al*. (2019) that includes implemented policies from large major emitting countries.

2.4.2 International Zero Emission Vehicle Alliance

Description

The Zero Emission Vehicle Alliance (ZEVA) aims to make all passenger cars in participating countries full electric as soon as possible, and no later than 2050. Their members are both countries and regions. A few countries have already reported 100% EV targets before 2050: 100% ZEV sales target years: 2025 (Norway); 2030 (Netherlands); 2035 (UK); 2040 (Canada/British Colombia); 2050 (US States, Germany). The US States are California, Connecticut, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, Vermont, Washington. Other participants are UK, States of Canada Quebec, States of Germany (Baden-Württemberg).

Quantification

For those countries and states that have not set an individual target, we assume they implement a 100% EV target by 2050. The state targets are scaled based on US EIA's transportation emissions by state (US Energy Information Administration, 2021) and Canada's official GHG inventory (Government of Canada, 2021). The EV share targets were implemented in the TIMER model that allows to fix a share for a specific car type. The results are compared to the current national policies scenario that is also used for the GFEI quantification. ZEVA does not have quantifiable aspirational goals, so we only quantified the potential impact of current members and targets.

2.4.3 Other transport ICIs: Lean and Green, EV100 and Urban Electric Mobility Initiative

We considered three more transport-related ICIs in our analysis: Lean and Green (L&G), EV100 and Urban Electric Mobility Initiative (UEMI). We quantified L&G's targets in the TIMER IMAGE model (as described before), but we did not find any additional impact. We found that the targets of EV100 and UEMI are not additional to the targets of ZEVA and GFEI, but will contribute to the targeted emissions reductions of these ICIs.

2.4.4 Air Transport Action Group

Description

The Air Transport Action Group (ATAG) is a coalition of member organisations and companies throughout the global air transport industry. It has 40 members worldwide. These include airports, airlines, airframe and engine manufacturers, air navigation service providers, leasing companies, airline pilot and air traffic controller unions, aviation associations, chambers of commerce, tourism and trade

partners, ground transportation and communications providers. ATAG has an overarching target of carbon neutral aviation by 2050.

Quantification

We based the quantification of ATAG's targets on the ICI's report "Waypoint 2050", in which different mitigation measures and scenarios are presented (Air Transport Action Group, 2020). There is still extensive uncertainty around current policies for aviation. We therefore assume that the current policies are comparable to the Scenario 0 (baseline / continuation of current trends) and Scenario 1 (pushing technology and operations), as presented in ATAG (2020). We only considered the mitigation potential of technological developments, operations and infrastructure improvements and sustainable aviation fuel for the quantification, as offsets do not lead to direct GHG emission reductions of ATAG's members. ATAG does not provide many details for the mitigation potential or any future goals in 2030. We therefore assume that any effect of aspirational goals will only start to have an impact after 2050 and have not determined an aspirational goal's scenario.

2.4.5 Results

Table 4: Global emission reduction potential of transport ICIs

Initiative	Global GHG emission reduction potential of current members and targets in 2030	Global GHG emission reduction potential of aspirational goals in 2030
Global Fuel Economy Initiative	378 $MtCO_2e$	429 $MtCO_2e$
International Zero-emissions Vehicle Alliance	26 $MtCO_2e$	26 $MtCO_2e$
Air Transport Action Group	85 – 167 $MtCO_2e$	85 – 167 $MtCO_2e$

2.5 Renewable energy

2.5.1 African Renewable Energy Initiative

Description

African countries together pledged its support for renewables during the 21st Conference of Parties (COP-21) meeting in Paris by establishing the African Renewable Energy Initiative (AREI). The Initiative is mandated by the African Union and endorsed by African Heads of State and Government on Climate Change, and led by the African Union's commission, the New Partnership for Africa's Development (NEPAD)'s Agency, the African Group of Negotiators, the African Development Bank, UN Environment, and the International Renewable Energy Agency (IRENA) (UNFCCC, 2015). The overall goals of the AREI are the following (Africa Renewable Energy Initiative, 2021a):

- Help achieve sustainable development, enhanced well-being, and sound economic development by ensuring universal access to sufficient amounts of clean, appropriate and affordable energy;
- Help African countries leapfrog to RE systems that support their low-carbon development strategies while enhancing economic and energy security.
- Achieve at least 300 GW by 2030 on the African continent.

Quantification

For AREI, we did not distinguish between a current membership and targets scenario and the aspirational goals scenario, as the initiative does not intend to be active outside the African continent. We quantified AREI's target of 300 GW installed renewable electricity capacity by 2030 (Africa Renewable Energy Initiative, 2021b).

We based our quantification on both the CPS and SDS from IEA's WEO 2019.

- We took projected installed RE capacity under current policies for the entire African continent and South Africa from the CPS.
- We then determined what share of Africa's projected RE capacity comes from South Africa. This share was used to determine the additional capacity under AREI for South Africa (i.e., *share ZAF * capacity target AREI*).
- We took the installed capacity of hydro from the SDS as the targeted installed capacity of hydro, as it is unlikely more hydro capacity can be installed beyond that.
- We determined the share of solar and wind of total RE capacity when excluding hydro capacity and applied these on the remaining additional capacity under AREI.
- We determined the capacity factors for hydro, solar and wind electricity based on the SDS to reflect realistic capacity factors with a high share of RE in the electricity generation mix.
- Using these capacity factors, we determined the additional RE generation under AREI, compared to the CPS.
- We converted this additional RE generation to GHG emissions reductions following the method as explained in Section 2.1.

2.5.2 Global Geothermal Alliance

Description

The Global Geothermal Alliance (GGA), supported by IRENA, was launched at COP-21 through coordination efforts from the geothermal industry, policymakers, and stakeholders worldwide. GGA is a coalition that calls for governments, businesses, and other actors to increase geothermal capacity in both electricity generation and heat generation worldwide. GGA has set ambitious goals to increase installed capacity for geothermal power generation by five-fold and geothermal heating by two-fold by 2030, but also has general goals to enhance the dialogue, cooperation and coordination of international and domestic actions related to all phases of geothermal energy deployment (GGA, 2021). As of March 2021, GGA has 46-member countries and 40 partner organizations that range from development banks to academic organizations (GGA, 2021).

Quantification

We quantified the same overarching goals of GGA for the quantification of the current members and targets and the aspirational goals (i.e., the capacity goals for electricity and direct use). Additional geothermal capacity is given by the difference between the targets set under GGA for 2030 and the geothermal capacity projected under current policies.

Firstly, we calculated the additional geothermal electricity capacity in 2030, compared to the CPS as presented in IEA's WEO 2019 CPS (IEA, 2019). The geothermal electricity capacity for 2016, the base year of GGA's target, is obtained from IEA's WEO 2018 (IEA, 2018d).

Secondly, we translated the additional geothermal electricity capacity into electricity savings with a global average capacity factors, obtained from IEA's WEO 2019 CPS and the Energy Demand and Supply Outlook (APERC, 2019). We converted the electricity savings into emissions savings following the method described in Section 2.1.

Thirdly, we calculated the additional geothermal heat capacity in 2030. Reference projections for geothermal heat capacity were taken from van der Zwaan and Dalla Longa (2019). We used the 'REF Scenario', which is roughly in line with IEA's WEO CPS. The GGA target of two-fold growth in geothermal heating applies to the geothermal heat capacity in 2016, the base year of the target, which we derived from Lund and Boyd (2015). We then translated the additional geothermal heat capacity into energy savings with direct-use capacity factors from Lund and Toth (2020). These capacity factors are assumed to stay constant until 2030. We used the average direct-use capacity factors for 2020 of geothermal heat pumps and space heating for all countries. The energy savings range are then translated into an emission savings range following the method described in Section 2.1.

The expected share of GGA's emission savings were allocated to countries based on their expected share of geothermal electricity capacity in 2030 following IEA WEO 2019 and their share in installed geothermal heat capacity in 2020 (Lund and Toth, 2020).

2.5.3 Results

Table 5: Global emission reduction potential of renewable energy ICIs

Initiative	Global GHG emission reduction potential of current members in 2030	Global aspirational GHG emission reduction potential of in 2030
AREI	375 - 878 $MtCO_2e$	375 - 878 $MtCO_2e$
GGA	159 - 343 $MtCO_2e$	159 - 394 $MtCO_2e$

2.6 Industry and business

2.6.1 RE100

Description

RE100 is an initiative of companies, with over 300 members as of June 2021, that have committed to source 100% of their electricity from renewable sources by a certain individual target year. Led by the Climate Group and in partnership with CDP, the work of RE100 is supported by a Steering Committee and a Technical Advisory Group.

Quantification

First, we determined the additional renewable electricity (RE) demand that RE100 members have. The 2018 share of renewable electricity in RE100's total demand was estimated at 46.1% (BloombergNEF, 2021a). In 2030, the 285 RE100 member companies (as of January 2021) would have a collective electricity demand of 359 TWh and would collectively need to purchase an additional 269 TWh of RE to meet their RE100 goals (BloombergNEF, 2021b).[1] This estimate of additional RE demand estimate is based on a conservative assumption on incremental growth of RE demand of RE100 members (i.e., the increase in RE demand without having an RE100 target). Therefore, we developed an additional baseline for RE demand by RE100 members:

1. We assume that the RE demand of RE100 members grows relatively fast and that most of RE100's current members are from OECD countries.
2. The share of RE of total electricity demand under IEA WEO's Stated Policies Scenario (STEPS) for OECD countries grows from 26.3% in 2018 to 41.1% in 2030, equalling a growth of 14.8 percentage points.
3. We added the 14.8 percentage points to the 2018 share of RE in electricity demand, to estimate the default share of RE demand in RE100's total electricity demand in 2030. This resulted in a baseline RE demand of RE100 members of 60.9%, or 234 TWh in 2030.
4. By comparing the baseline demand to the estimated total RE demand from RE100 members in 2030 – 359 TWh – we estimated the additional RE demand to be 125 TWh in 2030 (BloombergNEF, 2020, 2021a).

Second, we assumed that the RE100 members' total power and heat generation per geography would stay constant in 2030 at the 2019 levels as presented in the CDP dataset.[2] With this country-split, we calculated the additional RE demand by country in TWh and converted this to a GHG emission reduction

[1] The collective electricity demand was determined by combining two analyses by BloombergNEF, from 2020 and 2021, to reflect recent growth in RE100's membership. The additional 59 TWh of RE shortfall (269 TWh compared to 210 TWh) as presented in the 2021 analysis were added to the 300 TWh, to estimate the RE demand in 2030 of RE100 members.

[2] Based on confidential CDP data.

potential, using electricity emission factors for gas-fired power (minimum reduction potential) and coal-fired power (maximum reduction potential), as explained in Section 2.1.

For quantification of the initiative's aspirational goals, we assumed that RE100 will accomplish 334 TWh of additional RE demand compared to the reference baseline in 2030. This additional demand was calculated based on the assumption of continuous growth of RE100's membership. The annual average membership growth of RE100 over the last three years has been 57 members (CDP, 2021a). Following this trend, the number of members in 2030 would result in 813 members.[3] As of June 2021, roughly 300 members account for roughly 315 TWh (RE100, 2021). By applying the same ratio of electricity demand per member, we estimated the electricity demand of the 813 members to be 854 TWh in 2030. As for the quantification of RE100's current membership and targets, we assumed that a share of this electricity demand would already be RE-based. We again assumed that 60.9% of electricity would be RE-based under incremental growth of RE in the electricity mix, assuming a relatively high level of RE demand under (prospective) RE100 members. This resulted in 334 TWh of additional RE demand from RE100 members.

For the estimate of country-specific impact RE100's aspirational goal quantification, we applied the country shares of electricity generation of the global total electricity generation in 2030. With this country-split, we calculated the additional RE demand by country in TWh and converted this to a GHG emission reduction potential, using electricity emission factors for gas-fired power plants (minimum reduction potential) and coal-fired power plants (maximum reduction potential), as explained in Section 2.1. For the EU-27+UK and the US, using the shares in global electricity generation resulted in a slightly lower estimate than of the current membership and targets quantification. For these economies, we used the results from the current membership and targets quantification.[4]

2.6.2 Science Based Targets Initiative

Description

The Science-Based Targets initiative (SBTi) is a collaboration between CDP, World Resources Institute (WRI), the Worldwide Fund for Nature (WWF), and the United Nations Global Compact (UNGC) and is one of the We Mean Business Coalition commitments. Targets adopted by companies to reduce GHG emissions are considered "science-based" if they are in line with the level of decarbonisation required to keep global temperature increase below 2 °C and pursue efforts to limit global warming to 1.5 °C, compared to pre-industrial temperatures. The initiative's overall aim is that science-based target-setting will become standard business practice and corporations will play a major role in driving down global greenhouse gas emissions (SBTi, 2021).

Quantification

We based the quantification of SBTi's current membership and targets on CDP-reported science-based targets. These targets were also part of the individual actors' aggregation and were calculated in the same way, using the Climate Action Aggregation Tool (CAAT) (see Annex I of this publication). In addition to the individual actors' aggregation, we included SBTi targets beyond the ten major emitting economies. We quantified CDP-reported targets that were classified as being approved as science-based targets by SBTi, that had base year emissions and targets beyond 2020.

We based the quantification of SBTi's aspirational goals on the initiative's targeted emissions coverage of 5 $GtCO_2e$/year in 2025 (CDP, 2021b).[5] We assumed an equal split of this coverage between OECD

[3] This not an official target from RE100 and is an estimate from NewClimate Institute based on RE100's recent developments.
[4] This led to a slightly higher estimate of additional RE demand than the calculated 334 TWh. This increase is insignificant compared to the total: 6 TWh. It is balanced out with the relatively high share of baseline RE demand (60.9%) that was assumed for all global regions.
[5] This is not an official SBTi target.

and non-OECD countries. This was based on the assumption that the share of members from non-OECD countries will increase the most over the next few years and the share of members from OECD countries will increase only marginally.

For the coverage by country in OECD countries, we assumed the same ratio of coverage as available in the CDP dataset for the year 2019 (as used for the quantification of current membership and targets). For the emissions coverage by country in non-OECD countries, we used the countries' share of total non-OECD industry-related emissions in 2019. These two approaches resulted in SBTi's emissions coverage by country in 2025. To determine the GHG emissions coverage of SBTi's aspirational membership under current national policies in 2030, we extrapolated the 2025 emissions coverage to 2030 using country-specific emissions growth rates of the industry sector. To determine the GHG emissions of SBTi's aspirational members in 2030 under target realisation, we applied the annual emission reduction target of 4.2% from 2025 and onward.[6] The difference between the emissions under current policies and the annual emission reduction of 4.2% resulted in the SBTi's mitigation potential of its aspirational goals.

2.6.3 Results

Table 6: Global emission reduction potential of industry and business ICIs

Initiative	Global GHG emission reduction potential of current members in 2030	Global aspirational GHG emission reduction potential of in 2030
RE100	46 - 120 $MtCO_2e$	146 – 336 $MtCO_2e$
SBTi	210 $MtCO_2e$	1,112 $MtCO_2e$

2.7 Forestry

2.7.1 Description

For forestry-related ICIs, we assumed that The New York Declaration on Forests (NYDF) captures all relevant targets. We also considered the Bonn Challenge and Governors' Climate and Forest Task Force for the analysis.

The NYDF is endorsed by over 200 entities, including 41 governments, and covers all selected key countries from our study except for China, India and South Africa (NYDF, 2021). It was launched at the UN Climate Summit in 2014 and has ten goals related to forestry. We quantified Goal 1 and Goal 5. Goal 1 is to to halve the rate of forest loss by 2020 and completely end forest loss by 2030. Goal 5 calls for restoration of 200 million hectares of forest by 2030.

2.7.2 Quantification

Goal 1 of the NYDF does not specify whether the aim is to reduce and then end gross or net loss of natural forests (New York Declaration on Forests, 2018); in other words it is not clear if Goal 1 takes natural forest regeneration and reforestation, which is part of Goal 5, into account. Therefore, we took the following approach that combines both Goals 1 and 5:

1) For the ten countries assessed, countries with positive net GHG emissions from land use, land-use change and forestry (LULUCF) would reach zero in 2030. For countries with negative GHG emissions already today and also projected for 2030 under current policies, we assume no additional reductions beyond current policies scenario projections.
2) For the rest of the world (RoW), total LULUCF GHG emissions would reach zero in 2030. This is based on an assumption that most RoW countries have positive LULUCF emissions in 2030 (or in other words, most countries with negative LULUCF emissions are among the ten analysed in the project).

[6] This annual reduction target is based on personal communication with SBTi/CDP.

To ensure consistency between the global LULUCF emissions projections and the LULUCF projections from Kuramochi et al. (2019) used for country-specific scenario projections, we replaced global LULUCF emissions in the Climate Action Tracker and PBL IMAGE with business-as-usual (BAU) projections in Forsell et al. (Forsell *et al.*, 2016), which uses a similar set of models as with the projections in Kuramochi et al. (Kuramochi *et al.*, 2019) with some adaptations described below:

1) Emissions projections for the countries presented in Table 3 of Forsell et al. were replaced by current policies scenario projections from Kuramochi et al. (2019) whenever available.
2) 2015 historical emissions were estimated to be about 2.8GtCO_2e/year by taking the average of upper and lower estimates based on the first step described above.

On historical GHG emissions from LULUCF, Kuramochi et al. (2019) primarily used data from national GHG inventories submitted to the UNFCCC whereas Forsell et al. (Forsell *et al.*, 2016) used data from Food and Agriculture Organisation (FAO); Nicklas Forsell indicated that the LULUCF GHG data from national GHG inventories and FAO are in good agreement and thus comparable for most countries (Forsell, 2019).

For the quantification of current membership and targets, we only quantified endorser countries of NYDF. As there is limited data on LULUCF emission projections for smaller (RoW) countries, we assumed that LULUCF emissions would stay constant at 2019 levels (FAO, 2020). Positive LULUCF emissions from endorser countries were assumed to add up to the global mitigation potential of current members and targets. For the quantification of NYDF's aspirational goals, we assumed that Goal 1 and Goal 5 would be realised on a global scale.

2.7.3 Results

Table 7: Global emission reduction potential of forestry ICIs

Initiative	Global GHG emission reduction potential of current members in 2030	Global aspirational GHG emission reduction potential of in 2030
NYDF	1,306 – 1,313 MtCO_2e	4,938 – 5,135 MtCO_2e

2.8 Non-CO_2 GHGs

2.8.1 Climate and Clean Air Coalition

Description

The Climate and Clean Air Coalition (CCAC) works for "a prosperous, healthy, and sustainable future by mitigating short-lived climate pollutants (SLCPs)" (CCAC, 2020). SLCPs include methane (CH_4), hydrofluorocarbons (HFCs), black carbon and tropospheric ozone. For the timeframe up to 2030, the CCAC claims that global action to reduce SLCPs would save around 2.5 million lives by cutting indoor and outdoor air pollution, as well as increase crop yields by around 52 million tonnes each year (UNEP and WMO, 2011). CCAC currently has 71 state partners committed to reducing SLCPs. The Coalition has set the targets to reduce CH_4 emissions by 40% in 2030 and HFCs by 99.5% in 2050, compared to the respective 2010 emission levels (CCAC, 2020).

Quantification

We focused on CH_4 and HFCs for CCAC's quantification, as these types of SLCPs are usually included in GHG emission scenarios and CCAC has quantifiable reduction targets for these. As black carbon is not explicitly accounted for under the Paris Agreement, we have excluded it from the quantification. We assumed that the CH_4 and HFC reduction targets are reached linearly over time, starting from 2020.

Historical and projected emission data for CH_4 and HFCs were retrieved from the United States Environmental Protection Agency (US EPA, 2019). The EPA non-CO_2 GHG emission projections are a Business As Usual (BAU scenario and were used as a baseline. For non-CO2 GHG emissions, the BAU is similar to a Current National Policies Scenario (CNP), as little to none new policies have been

announced recently (NewClimate Institute, 2021). Hence, we used the BAU as is for the quantification of the GHG emission reduction potential compared to a CNP.

The potential impact of current members is calculated with the percentage reduction target of the initiative applied to the projected emissions of every CCAC member state. The emissions savings from all member countries for CH_4 and HFCs are added up to retrieve the global sum. For the quantification of CCAC's aspirational goals, we translated the CCAC-stated global GHG emission reduction potential of 5.2 $GtCO_2e$ in 2030 to the country-level. The individual countries' share of the global potential was calculated according to their share in global non-CO_2 GHG emissions projections by the EPA.

2.8.2 Results

Table 8: Global emission reduction potential of non-CO_2 ICIs

Initiative	Global GHG emission reduction potential of current members in 2030	Global aspirational GHG emission reduction potential of in 2030
CCAC	2,166 $MtCO_2e$	5,236 $MtCO_2e$

2.9 Cities and regions

2.9.1 C40 Cities Climate Leadership Group

Description

C40 is a network of megacities committed to addressing climate change. It was founded in 2005 by the Mayor of London in collaboration with representatives from 18 other megacities. Today, the C40 Cities Climate Leadership Group connects 97 of the world's largest cities, representing 1 in 12 people worldwide and one quarter of the global economy. C40 "*supports cities to collaborate effectively, share knowledge and drive meaningful, measurable and sustainable action on climate change*" (C40, 2021). C40 aims to assist cities to implement robust climate action plans which are aligned with the 1.5°C target of the Paris Agreement and increase climate resilience and equity. If this is achieved, C40 cities could halve their collective emissions by 2030 (C40 Cities, 2020).

Quantification

We used the Climate Action Aggregation Tool (CAAT) for the quantification of C40's potential impact (ICAT, 2021). For each city, the CAAT determines the targeted emissions levels in the target year(s) and develops a baseline emissions scenario based on the reference scenario (CNP). The CAAT then develops two emissions time series: 1) a series under target realisation and 2) a reference series. By comparing the two, an emission reduction potential on the actor level is determined.

We only quantified cities with a base year and base year emissions and with targets beyond 2020. These criteria excluded several cities from the quantification – we quantified the targets for 49 of total 97 C40 cities. We used the city-reported targets to calculate the "current membership, current ambition" scenario. As there is limited information available regarding C40's targeted membership, aspirational goals, and city-level targets of cities that are not covered in our analysis, we did not quantify an aspirational goals scenario.

2.9.2 Under2 Coalition

The Under2 Coalition, is an initiative that brings together subnational governments committed to ambitious climate action and keeping global temperature rises to well below 2°C. The coalition is made up of over 220 governments as of April 2021, representing 1.3 billion people and 43% of the global economy (The Climate Group, 2019). Each signatory of the initiative commits to reduce their GHG emissions trajectory to the levels consistent with the Paris Agreement's goal to limit temperature rise below 2°C, i.e. to 80-95% below 1990 levels or to below 2 tCO_2e per capita by 2050. The initiative supports governments to develop long term decarbonization pathways, scale and share best climate

policy practices, and to track and maintain their emissions inventories. The Climate Group is the Secretariat to the Under2 Coalition.

Quantification

For the quantification of Under2 Coalition's current membership and targets, we quantified cities and regions with a base year and corresponding base year emissions and with targets beyond 2020. These criteria excluded several cities from the quantification. We used the CAAT for the quantification of Under2's potential impact (ICAT, 2021). For each region or city, the CAAT determines the targeted emissions levels in the target year(s) and develops a reference emissions scenario based on the reference scenario's growth rate (the current policies scenario). The CAAT then develops two emissions time series: 1) a series under target realisation and 2) a reference series. By comparing the two, an emission reduction potential on the actor level is determined.

For the quantification of Under2 Coalition's aspirational goals, we determined the share of population covered by Under2 targets on a country level. We obtained the population data from Under2 Coalition and determined what share of countries' population is covered by the initiative's current active members in 2017 (United Nations Department of Economic and Social Affairs: Population Division, 2018; Under2 Coalition and The Climate Group, 2021). We excluded inactive members from this assessment. These country shares were then used as a proxy for the share of a country's GHG emissions covered by the initiative in 2030. Under2 Coalition has an aspirational emission reduction target of 80-95% in 2050, which we assumed to be realised linearly from 2018. Therefore, we assumed that Under2 Coalition members are at 32-37% emission reduction in 2030. We applied this emission reduction percentage on the reference emissions covered in 2030 to estimate the emission reductions in 2030.

2.9.3 Global Covenant of Mayors (GCoM)

The Global Covenant of Mayors for Climate and Energy (GCoM) was launched in June 2016 through the joining of the EU Covenant of Mayors, comprised of more than 7,600 local and regional authorities voluntarily committing to meet and exceed the EU 20% CO_2 reduction objective through energy efficiency and RE, and the Compact of Mayors, a coalition of major global cities around the world committing to reduce local greenhouse gas emissions, enhance resilience to climate change, and track their progress transparently. GCoM's members share a long-term vision of promoting and supporting voluntary action on climate change towards a low-emission and climate-resilient future. As of April 2021, GCoM has 10,605 member cities, accounting for more than 978 million inhabitants. Signatories identify appropriate commitments, and pledge to communicate these transparently to their citizens, and then develop inventories and climate action plans to achieve their goals. By 2030, Global Covenant cities and local governments could account for 2.3 billion tons CO_2e of annual emissions reduction (Global Covenant of Mayors for Climate and Energy, 2021).

We used the CAAT for the quantification of GCoM's current membership and targets (ICAT, 2021). For each region or city, the CAAT determines the targeted emissions levels in the target year(s) and develops a baseline emissions scenario based on the reference scenario's growth rate (the current policies scenario). The CAAT then develops two emissions time series: 1) a series under target realisation and 2) a reference series. By comparing the two, an emission reduction potential on the actor level is determined. We quantified city or region-reported post-2020 targets, that have a corresponding base year and base year emissions.

For the quantification of GCoM's aspirational goals, we used the ICI-wide emissions reported by GCoM and developed a reference scenario that matches the CNP scenario as used in this analysis. For this, we took the 2015 BAU emissions and applied our country specific CNP emissions growth rates to estimate the CNP emissions of GCoM cities and regions in 2030 (Global Covenant of Mayors for Climate and Energy, 2019). By comparing these to the GCoM members emissions projected by GCoM, we found the potential emission reductions in 2030. The CNP scenario is lower than the BAU as developed by GCoM, mainly due to lower emission projections for e.g. the EU.

2.9.4 Results

Many cities and regions are represented in more than one of the C40, Under2 Coalition, and Global Covenant of Mayor initiatives. In this case, we quantify only one commitment in the order more narrow scale of operation. Thus, if a city or region is part of multiple initiatives, it is first attributed to C40, then GCoM, then Under2 Coalition. These potential overlaps and our approach to avoiding the double counting of these emissions reductions is discussed in Section 3.

Table 9: Global emission reduction potential from cities and regions ICIs

Initiative	Global GHG emission reduction potential of current members in 2030	Global aspirational GHG emission reduction potential of in 2030
C40	558 $MtCO_2e$	558 $MtCO_2e$
Under2 Coalition	638 $MtCO_2e$	3,296 $MtCO_2e$
GCoM	428 $MtCO_2e$	1,623 $MtCO_2e$

3. Quantification of overlaps between ICIs

3.1 Approach

After calculating the emission reduction potential relative to a baseline scenario (i.e., current national policies scenario) for each initiative, possible overlaps among initiatives were analysed within each country and on a global scale. Overlap occurs when the calculated emissions reduction potential of two or more initiatives are not (entirely) additional to one another (Hsu *et al.*, 2019).

For each of the ten major emitting economies as well as the rest of the world, we first developed an overlap matrix (**Error! Reference source not found.**) to identify potential overlaps among any combination of the 20 initiatives assessed in this study. In the matrix, 'y' stands for 'yes' (there is overlap) and 'n' for 'no' (there is no overlap). We based this categorisation on whether one or more of the four types of overlap were evident and/or whether an ICI possibly reduces the potential impact of another ICI without it being accounted for in its initial quantification. The ICIs in the horizontal axis were compared to the ICIs in the vertical axis.

The impact of climate initiatives can overlap in various ways. We identified four different types of overlap: 1) geographic overlap (e.g. cities with commitments within regions with commitments), 2) targeted emissions overlap (e.g. two initiatives targeting emissions from freight transport), 3) membership overlap (e.g. a company committed to more than one initiative) and 4) non-sector overlap (in case an initiative does not target a specific sector it is potentially overlapping with sector-specific initiatives) (NewClimate Institute *et al.*, 2018; Hsu *et al.*, 2019; Smit, 2019; Lui *et al.*, 2021).

Based on the overlap matrix, we quantified the overlap rates between initiatives. An overlap rate is defined as the percentage of GHG emissions reduction impact for an initiative that is overlapping with another initiative. To avoid double counting of overlaps, only overlaps between an initiative and all preceding initiatives in the list were considered (e.g., for initiative no.10 on the list, overlaps with initiatives no.1 through no.9 were quantified). The emission source overlap was the main indicator for overlap estimation; the overlap rates were quantified based on the energy balances data, GHG emissions data and/or sector-specific production data in the modelling base year (2013–2016, depending on the initiative). We also examined if there was a noticeable difference in ambition levels across initiatives to account for potential additional impact of an initiative even when the emissions coverage is fully overlapping with another initiative. Since all initiatives are unique one way or another in terms of their geographic, sector and emissions scope as well as their mid- to long-term target definitions, several initiative-specific assumptions were made; some examples are described in the technical annex II of the 2018 report (Data-Driven Yale, NewClimate Institute and PBL, 2018).

Sector	No.	Initiative	1 Industry Energy Accelerator	2 United for Efficiency	3 Architecture 2030	4 Air Transport Action Group	5 Global fuel economy initiative	6 Internat. ZeroEmissions Vehicle In.	7 Africa Renewable Energy Initiative	8 Global Geothermal Alliance	9 RE100	10 Science Based Targets initiative	11 NYDF	12 Climate and Clean Air Coalition (Main)	13 C40 Cities Climate Leadership Group	14 Global Covenant of Mayors for Climate & Energy	15 Under 2 MOU = Under 2 Coalition
			Energy efficiency		Buildings	Transport			Renewable energy		Businesses		Forestry	non-CO2 GHGs	Cities and regions		
Energy efficiency	1	Industry Energy Accelerator		y	n	n	n	n	y	y	y	y	n	n	y	y	y
	2	United for Efficiency			n	n	n	n	y	y	y	y	n	n	y	y	y
Buildings	3	Architecture 2030				n	n	n	n	n	n	n	n	n	y	y	y
Transport	4	Air Transport Action Group					n	n	n	n	n	n	n	n	y	y	y
	5	Global fuel economy initiative						n	n	n	n	n	n	y	y	y	y
	6	Internat. ZeroEmissions Vehicle In.							n	n	n	n	n	y	y	y	y
Renewable energy	7	Africa Renewable Energy Initiative								n	y	y	n	n	y	y	y
	8	Global Geothermal Alliance									y	y	n	n	y	y	y
	9	RE100										y	n	n	y	y	y
Business es	10	Science Based Targets initiative											n	n	y	y	y
	11	NYDF												y	n	n	y
Forestry	12	Climate and Clean Air Coalition (Main)													y	y	y
	13	C40 Cities Climate Leadership Group														y	y
non-CO2 GHGs	14	Global Covenant of Mayors for Climate & Energy															y
Cities and regions	15	Under 2 MOU = Under 2 Coalition															

Figure 1: Overlap matrix for identifying overlaps between ICIs (source: authors' elaboration)

3.2 Results

Table 10 and Table 11 present the sectoral emission reduction potentials of ICIs' current members and targets. Table 12 and Table 13 present the sectoral emission reduction potentials of ICIs' aspirational goals. We considered intra-sectoral overlaps for these sector results; we did not account for inter-sectoral overlaps here.

Table 10: Sectoral emission reduction potentials after correction for overlap, in 2030, current membership and targets ($MtCO_2e$/year)

Countries	Energy efficiency	Buildings	Transport	Renewable Energy
Brazil	1-3	0	12	0
Canada	0	32-38	3	0
China	19-45	10-19	76	0
EU	0	14-26	26	7-14
India	3-7	0-1	5	0
Indonesia	17-47	0	20	50-107
Japan	0	0	7	7-14
Mexico	4-18	0	9	10-22
South Africa	4-17	0	0	25-65
US	0	104-110	90	33-71
Rest of the world	52-192	3-6	157	242-549
World	99-309	163-200	489-571	373-844

Table 11: Sectoral emission reduction potentials after correction for overlap, in 2030, current membership and targets ($MtCO_2e$/year)

Countries	Business & Industry	Forestry	Non-CO_2 GHGs	Cities & Regions
Brazil	12	0	0	6
Canada	1	0	52	84
China	8	0	0	476-476
EU	20-42	0	127	83
India	6	0	324	24
Indonesia	2	749-755	139	144
Japan	4-12	0	23	6
Mexico	7	0	91	20
South Africa	2	0	0	15
US	39-48	0	376	463
Rest of the world	127-128	558	1,034	0
World	228-244	1307-1313	2166	1323

Table 12: Sectoral emission reduction potentials after correction for overlap, in 2030, aspirational goals ($MtCO_2e$/year)

Countries	Energy efficiency	Buildings	Transport	Renewable Energy
Brazil	14-15	0	12	0
Canada	0	43-49	3	0
China	160-316	25-46	82	0
EU	0	139-145	26	7-14
India	136-261	1-3	5	0
Indonesia	33-46	1	20	50-107
Japan	0-1	1	7	7-14
Mexico	10-18	0	9	10-22
South Africa	10-17	0	0	25-65
US	0	139-145	90	33-71
Rest of the world	403-574	12-26	203	242-549
World	787	1299	250	313

Table 13: Sectoral emission reduction potentials after correction for overlap, in 2030, aspirational goals ($MtCO_2e$/year)

Countries	Business & Industry	Forestry	Non-CO_2 GHGs	Cities & Regions
Brazil	14-15	352-370	190	299-340
Canada	7-8	0	52	185-207
China	275-286	0	1075	1658-1896
EU	147-152	0	127	423-485
India	122-125	0	324	208-240
Indonesia	22	749-755	139	109-118
Japan	59-61	0	23	23-24
Mexico	8-9	0	91	218-250
South Africa	8	0	54	111-121
US	223-229	0	376	1062-1200
Rest of the world	283-292	3838-4009	2785	1181-1214
World	1168-1208	4939-5134	5236	5477-6095

4. International cooperative initiatives: aggregation results per country

4.1 Brazil

We found that the GHG emission reduction potential of ICIs' current members and targets in Brazil is 30 – 31 MtCO2e in 2030. The ICIs' aspirational goals could lead to GHG emission reductions of up to 623-646 $MtCO_2e$ in 2030. The major share of the latter potential originates from NYDF, CCAC and U4E. Smaller contributions to the emission reduction potential could come from aspirational members of GFEI and SBTi.

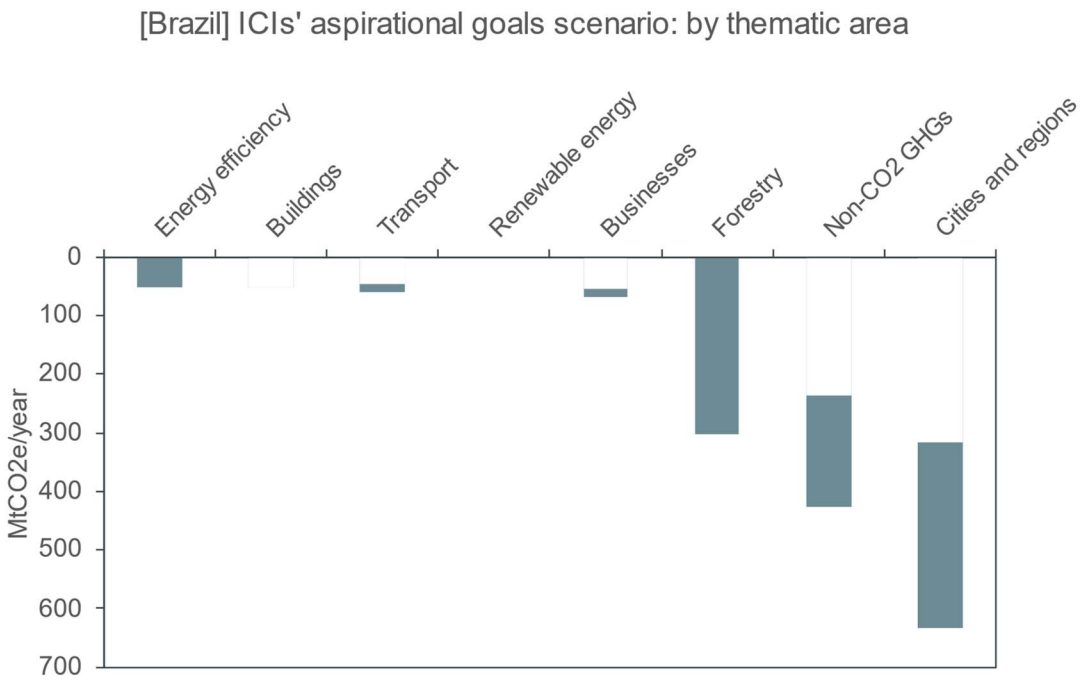

Figure 2: Potential greenhouse gas (GHG) emissions reductions in Brazil resulting from the full implementation of international cooperative initiatives (ICIs)' aspirational goals (average of high and low estimates) per thematic area compared to the "current national policies" scenario.

4.2 Canada

We found that ICIs in Canada, under their current membership, have a GHG emission reduction potential of 148 $MtCO_2e$ in 2030. Most of the quantified initiatives are currently active in Canada, leading to only a minor additional impact from ICIs' aspirational goals (201 $MtCO_2e$/ in 2030). The largest contributions to these emission reduction potentials come from Under2, CCAC and A2030.

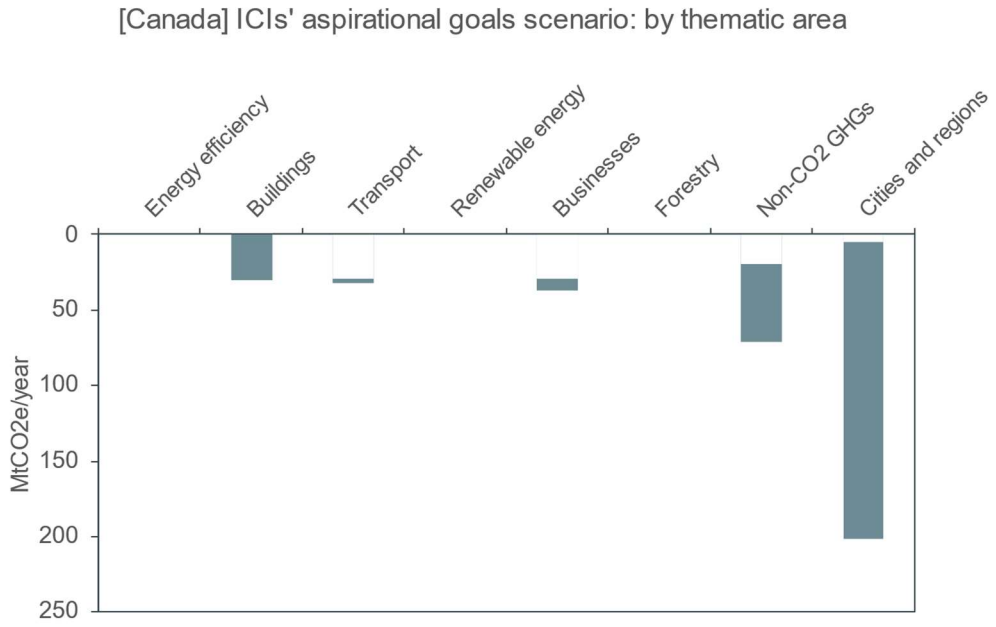

Figure 3: Potential greenhouse gas (GHG) emissions reductions in Canada resulting from the full implementation of international cooperative initiatives (ICIs)' aspirational goals (average of high and low estimates) per thematic area compared to the "current national policies" scenario.

4.3 China

We estimated that the GHG emission reduction potential from current members of ICIs in China is 580 – 608 $MtCO_2e$ in 2030. The potential of ICIs' current members and targets in China differs extensively from the emission reduction potential from ICIs' aspirational goals, which is estimated at 2.7 – 2.8 $GtCO_2e$ in 2030. Since China is the world's largest emitter of GHGs, the reduction potential would be high if China participated in all ICIs. Of the current members and targets, the largest potential is from C40. Under the aspirational membership scenario, there is a particularly large GHG emission reduction potential from CCAC (1 $GtCO_2e$).

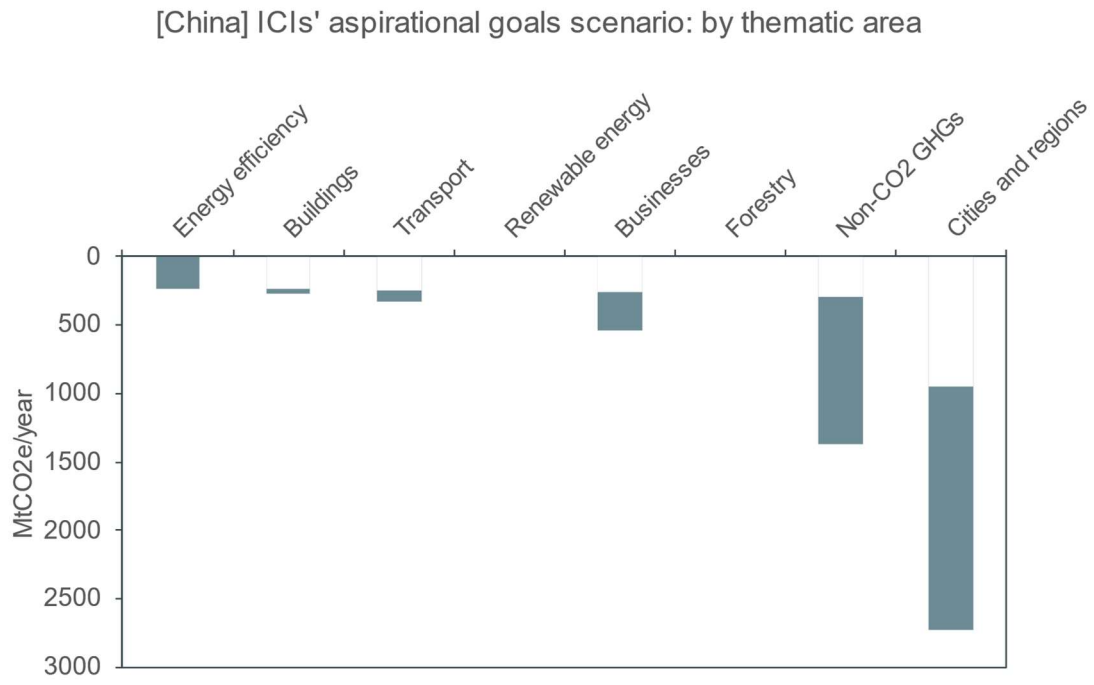

Figure 4: Potential greenhouse gas (GHG) emissions reductions in China resulting from the full implementation of international cooperative initiatives (ICIs)' aspirational goals (average of high and low estimates) per thematic area compared to the "current national policies" scenario.

4.4 EU-27 + UK

The GHG emission reduction potential from current members of ICIs in the EU27+UK is estimated to be 225 – 244 $MtCO_2e$ in 2030. All initiatives that we quantified, except for those that exclusively target developing economies, are currently active in the EU-27+UK. The largest emission reduction potential under current members and targets comes from CCAC, followed by Under2 Coalition. The GHG emission reduction potential under the CNP + ICIs' goals scenario is estimated to be 545-574 $MtCO_2e$ in 2030, with large contributions from Under2, CCAC and SBTi.

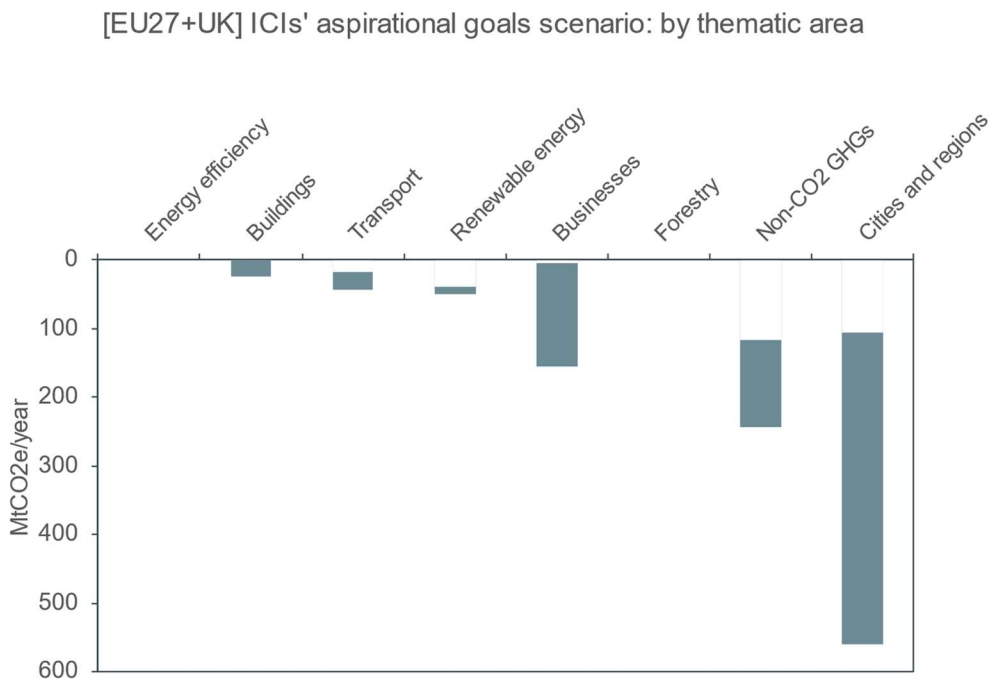

Figure 5: Potential greenhouse gas (GHG) emissions reductions in EU-27+UK resulting from the full implementation of international cooperative initiatives (ICIs)' aspirational goals (average of high and low estimates) per thematic area compared to the "current national policies" scenario.

4.5 India

The GHG emission reduction potential from current members of ICIs in India is estimated to be 359 – 361 $MtCO_2e$ in 2030. The largest potentials are from CCAC, of which India has been a member since 2019, and C40 Cities. Under ICIs' aspirational goals, we found a potential impact 706– 767 $MtCO_2e$. Besides CCAC, we found major reduction potentials for Under2 Coalition, U4E and SBTi.

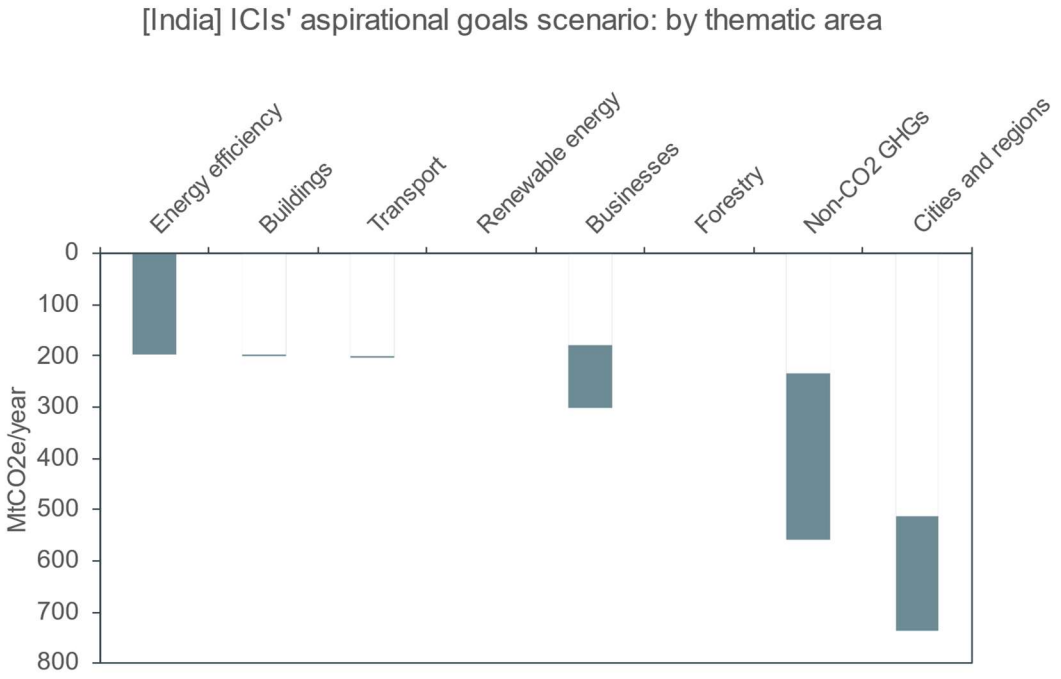

Figure 6: Potential greenhouse gas (GHG) emissions reductions in India resulting from the full implementation of international cooperative initiatives (ICIs)' aspirational goals (average of high and low estimates) per thematic area compared to the "current national policies" scenario.

4.6 Indonesia

The GHG emission reduction potential from ICIs' current members and targets, as well as ICIs' aspirational goals in Indonesia is estimated to be roughly 1 $GtCO_2e$ in 2030. A major part of this potential derives from NYDF.

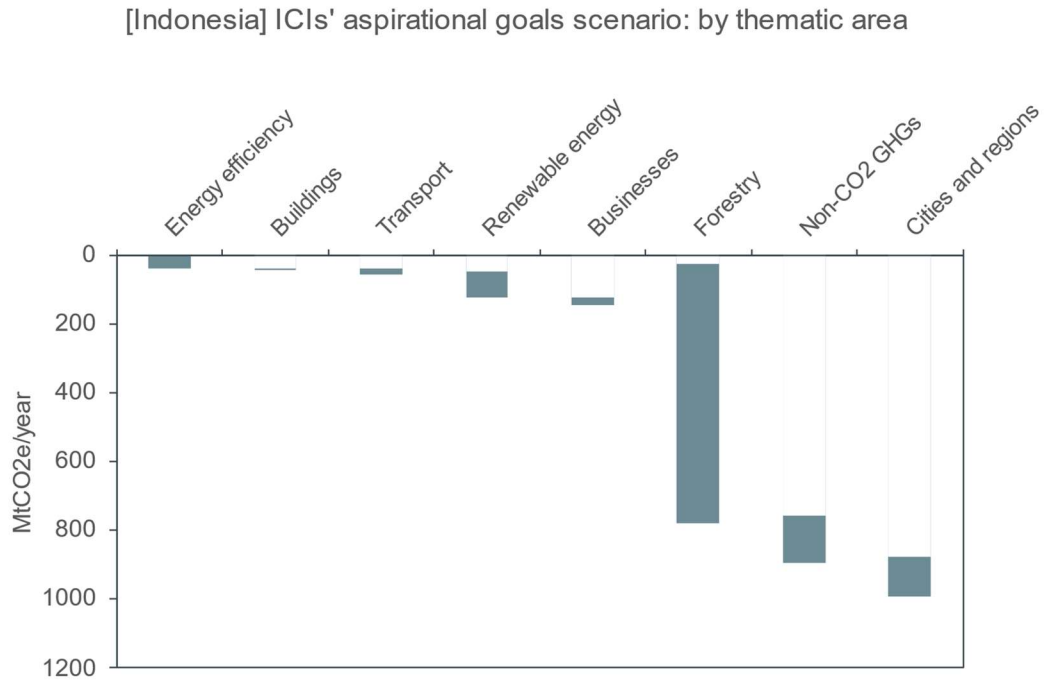

Figure 7: Potential greenhouse gas (GHG) emissions reductions in Indonesia resulting from the full implementation of international cooperative initiatives (ICIs)' aspirational goals (average of high and low estimates) per thematic area compared to the "current national policies" scenario.

4.7 Japan

The GHG emission reduction potential of ICIs' current members in Japan is estimated to be 43 – 56 $MtCO_2e$ in 2030 and up to 111 $MtCO_2e$ of ICIs' aspirational goals. For the aspirational goals' scenario, we found the largest potential by the SBTi. Other major potential impacts were found for CCAC, GCoM and GGA.

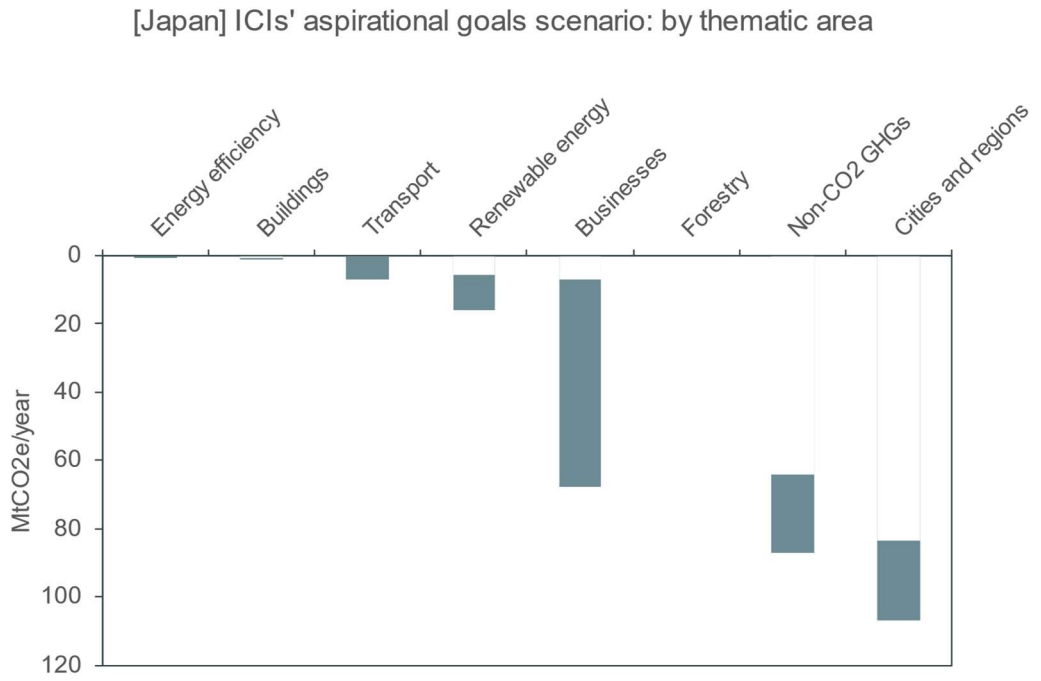

Figure 8: Potential greenhouse gas (GHG) emissions reductions in Japan resulting from the full implementation of international cooperative initiatives (ICIs)' aspirational goals (average of high and low estimates) per thematic area compared to the "current national policies" scenario.

4.8 Mexico

The GHG emission reduction potential of ICIs' current members and targets in Mexico is estimated to be 136 – 156 $MtCO_2e$ in 2030. All initiatives we quantified are active in Mexico. A major part of the total reduction potential derives from Mexico's membership in the CCAC. Other significant contributions come from GGA (10 – 22 $MtCO_2e$) and U4E (9 – 17 $MtCO_2e$). For the ICIs' aspirational goals scenario, we found an emission reduction potential of roughly 220 $MtCO_2e$, with major contributions from Under2 Coalition, GCoM, GGA and U4E.

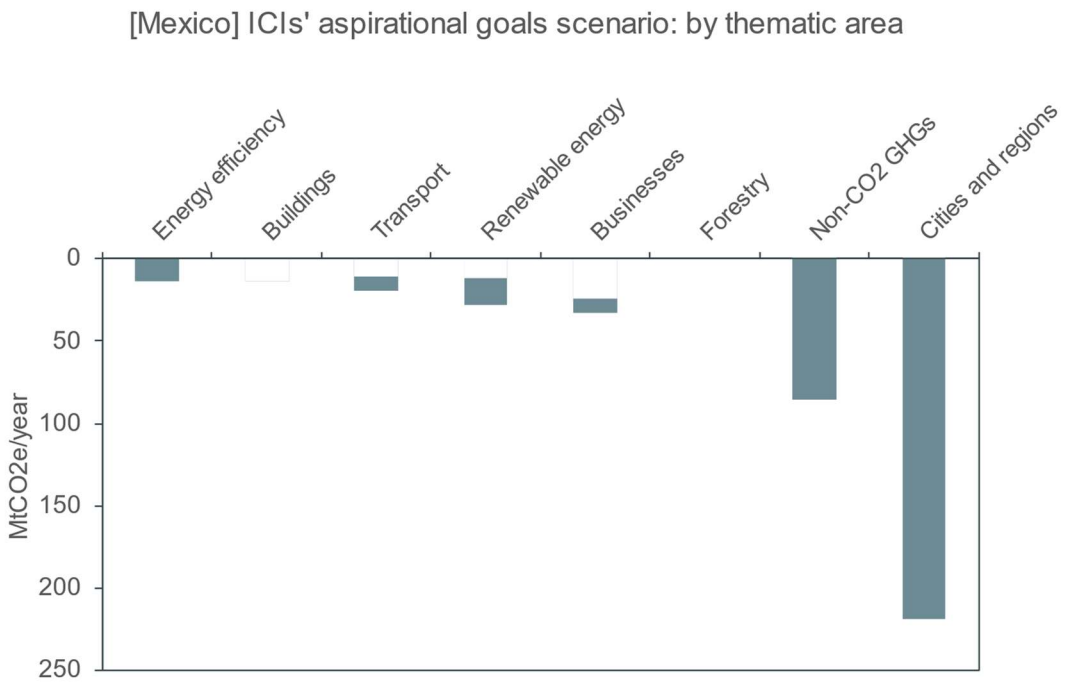

Figure 9: Potential greenhouse gas (GHG) emissions reductions in Mexico resulting from the full implementation of international cooperative initiatives (ICIs)' aspirational goals (average of high and low estimates) per thematic area compared to the "current national policies" scenario.

4.9 South Africa

The GHG emission reduction potential from current and targets members of ICIs in South Africa is estimated to be 44 – 89 $MtCO_2e$ in 2030. By far the largest part of this potential (25 – 65 $MtCO_2e$) is from AREI, which only operates on the African continent. In addition, the potential impact from C40 is estimated to be relatively large under current membership in South Africa. We estimated the potential impact of ICIs' aspirational goals to be 130 – 154 $MtCO_2e$, with major contributions from CCAC, GCoM, Under2 and U4E.

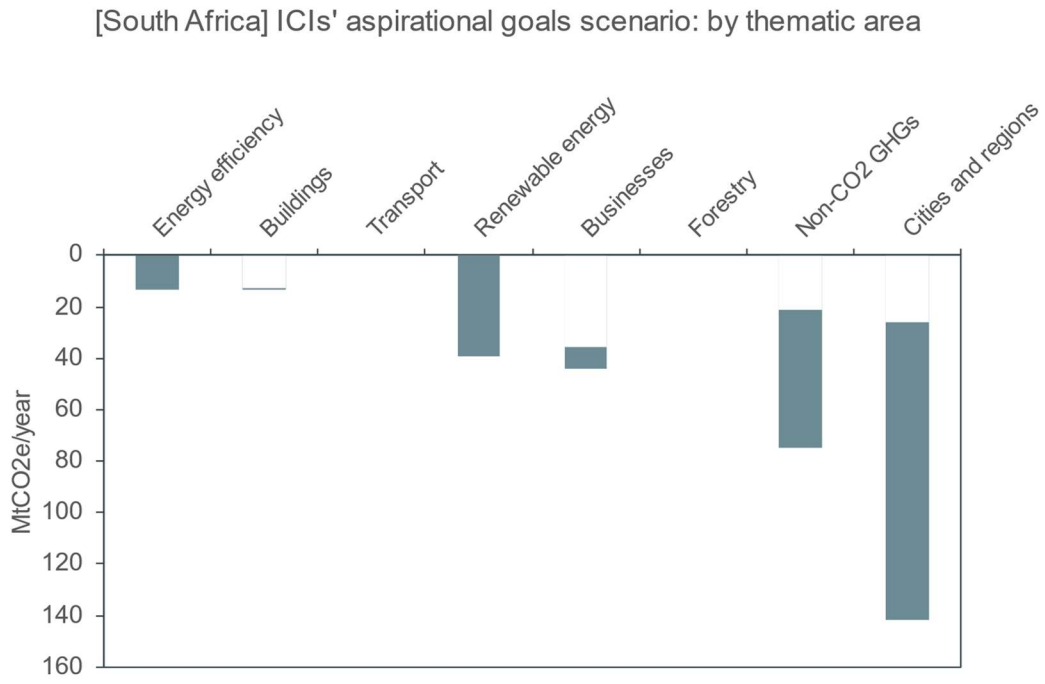

Figure 10: Potential greenhouse gas (GHG) emissions reductions in South Africa resulting from the full implementation of international cooperative initiatives (ICIs)' aspirational goals (average of high and low estimates) per thematic area compared to the "current national policies" scenario.

4.10 United States

The GHG emission reduction potential from ICIs' current members and targets in the US is estimated to be roughly 940 $MtCO_2e$ in 2030. This is the largest current potential out of all ten major economies. All initiatives we quantified, except for those that exclusively target developing economies, are currently active in the US. Under the CNP + ICIs' goals scenario, we found an emission reduction potential of 1.4 $GtCO_2e$ in 2030, with major contributions from Under2, SBTi, GCoM, C40 and A2030.

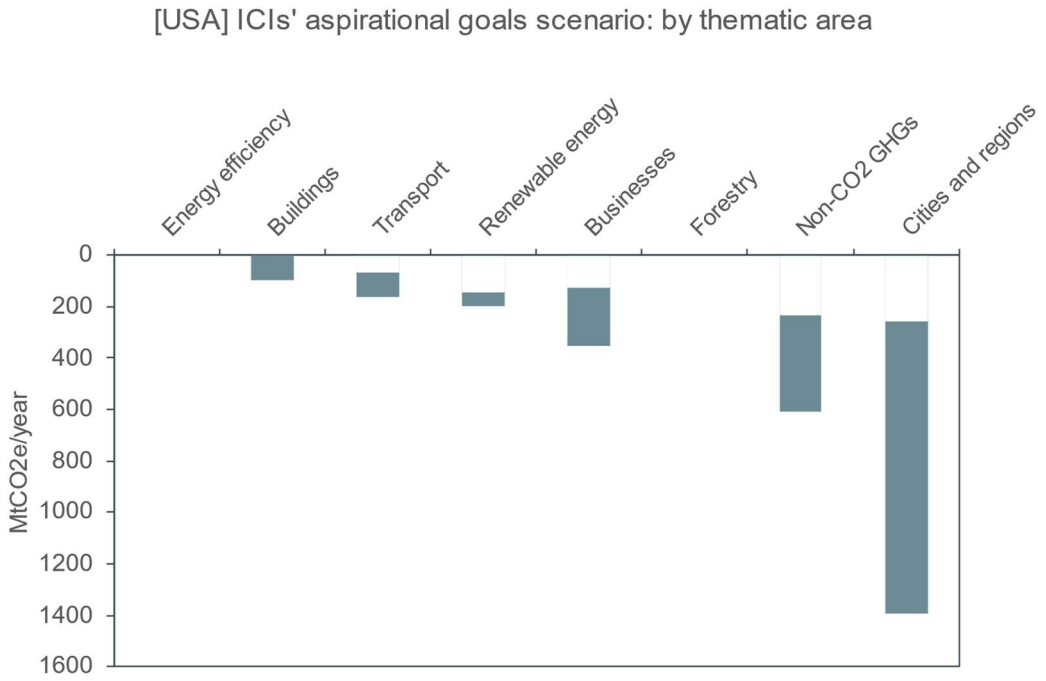

Figure 11: Potential greenhouse gas (GHG) emissions reductions in the US resulting from the full implementation of international cooperative initiatives (ICIs)' aspirational goals (average of high and low estimates) per thematic area compared to the "current national policies" scenario.

4.11 Rest of the world

Besides the major GHG emission reduction potentials that were found for the ten major economies, we found emission reduction potentials in countries beyond our analysis for many ICIs. Under ICIs' current membership and targets, ICIs have a potential impact of up to 2.5 $GtCO_2e$/year in the rest of the world (RoW). Under ICIs' aspirational goals, we found a potential impact of up to 8.4 $GtCO_2e$/year – roughly half of the global potential impact found under this study. A major share of this emission reduction potential comes from NYDF, GCoM and CCAC, but also the potential impact of U4E, AREI, GFEI and GCoM are found to have a substantial potential impact in countries beyond the analysed ten.

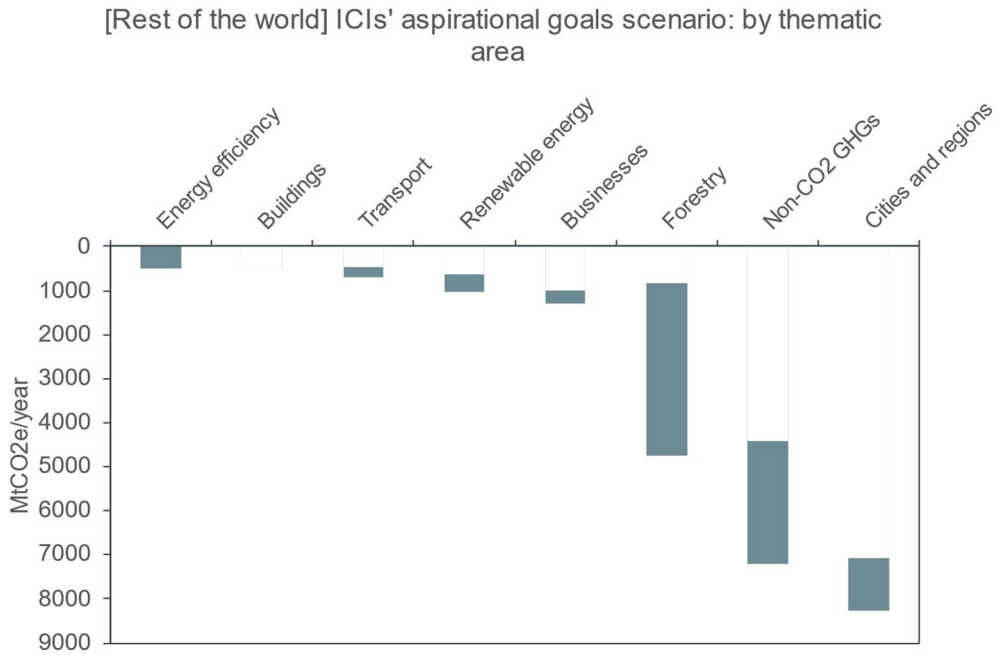

Figure 12: Potential greenhouse gas (GHG) emissions reductions in the rest of the world resulting from the full implementation of international cooperative initiatives (ICIs)' aspirational goals (average of high and low estimates) per thematic area compared to the "current national policies" scenario.

5. International cooperative initiatives: output performance per thematic area

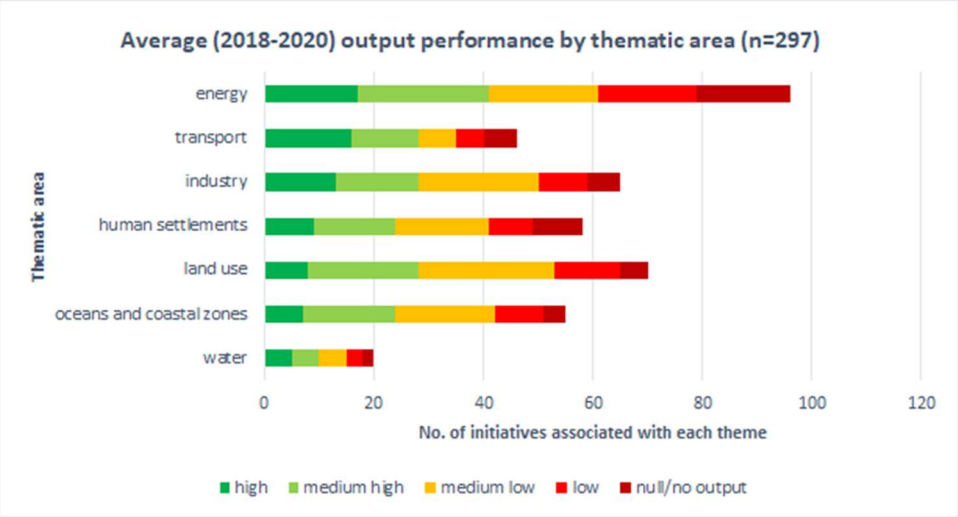

Figure 13: Output performance of international cooperative initiatives by thematic area. Source: Chan et al. (2021)

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