Parallel Session 3

Strategies for mitigation of and adaptation to climate change.

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attle of the Jungle

BRENDAN BRADY / SORNG RUKAVORN Monday, June 20, 2011

Forest guardian: Tha Soun has confronted illegal loggers numerous times in his effort to preserve Sorng Rukavorn, a prized prayer ground
Brendan Brady

0

Cambodia's Sorng Rukavorn forest is a sanctuary for nature — and faith. Situated in the country's remote far

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More on TIME.com

A small rain-forest and soybean crops in Mato Grosso, Brazil
John Lee / Aurora

Humanity's Carbon Emissions

88% 7.7 billion metric tonnes per year

Fossil Fuels & Cement 2000 to 2009

12% 1.1 billion metric tonnes per year

Land Use Change 2000 to 2009

Where Humanity's Carbon Goes

47% 4.1 billion metric tonnes per year

Atmosphere 2000 to 2009

27% 2.4 billion metric tonnes per year

Land 2000 to 2009

26% 2.3 billion metric tonnes per year

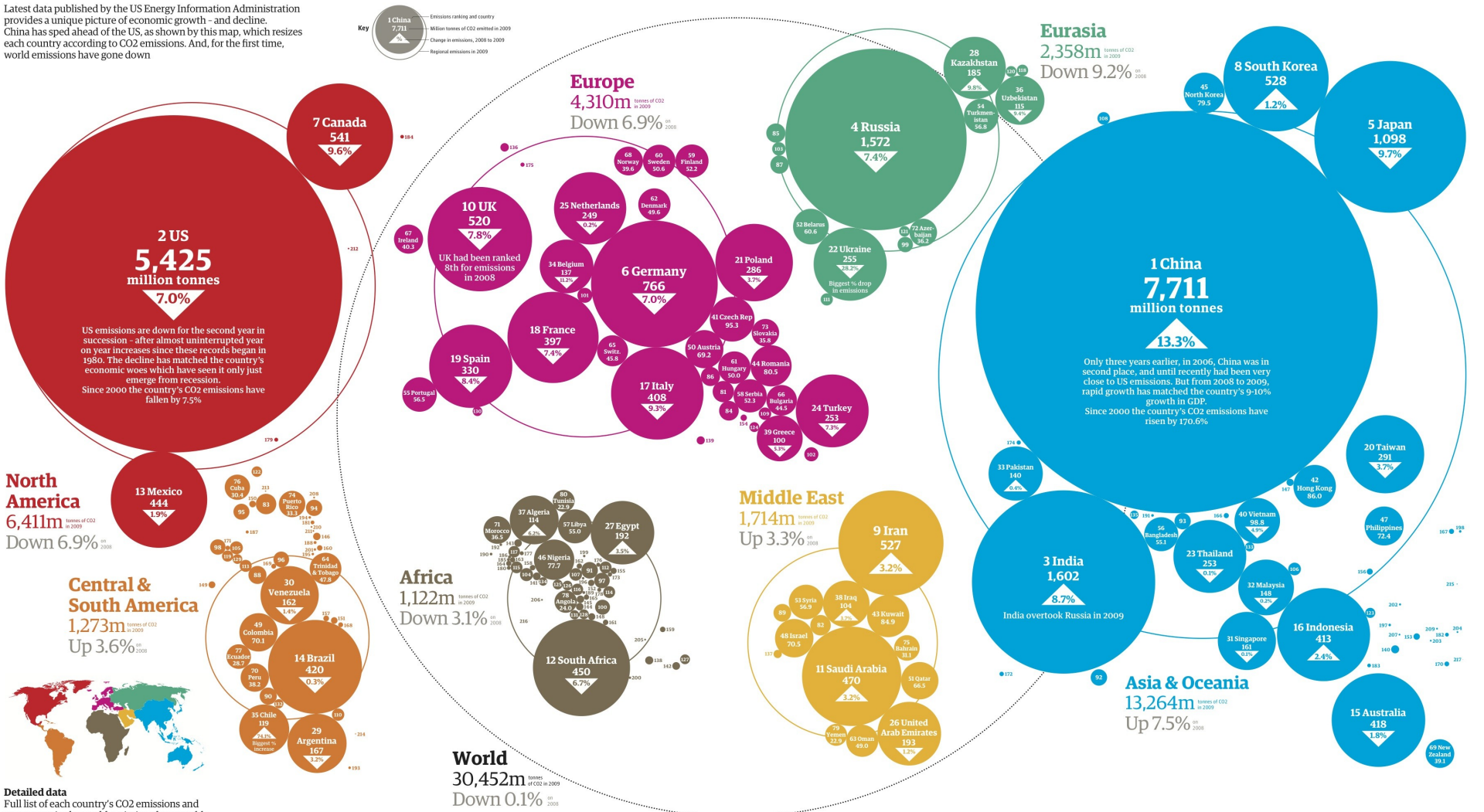
Oceans 2000 to 2009

Data published Nov. 21 2010 at Nature Geoscience + GlobalCarbonProject.org

Graphic Production: CO2Now.org

An atlas of pollution: the world in carbon dioxide emissions

Latest data published by the US Energy Information Administration provides a unique picture of economic growth – and decline. China has sped ahead of the US, as shown by this map, which resizes each country according to CO2 emissions. And, for the first time, world emissions have gone down



Detailed data
Full list of each country's CO2 emissions and movement in the world emissions league table

Rank/ change on 2008	Country	Million tonnes 2009	Percent change 08–09
= 1	China	7,711	13.3
= 2	US	5,425	-7.0
▲ 3	India	1,602	8.7
▼ 4	Russia	1,572	-7.4
= 5	Japan	1,098	-9.7
= 6	Germany	766	-7.0
= 7	Canada	541	-9.6
▲ 8	South Korea	528	1.2
▲ 9	Iran	527	3.2
▼ 10	UK	520	-7.8
▲ 11	Saudi Arabia	470	3.2
▼ 12	South Africa	450	-6.7
= 13	Mexico	444	-1.9
▲ 14	Brazil	420	-0.3
▲ 15	Australia	418	-1.8
▲ 16	Indonesia	413	2.4
▼ 17	Italy	408	-9.3
▼ 18	France	397	-7.4
= 19	Spain	330	-8.4
▲ 20	Taiwan	291	-3.7
▲ 21	Poland	286	-3.0
▼ 22	Ukraine	255	-28.2

Rank/ change on 2008	Country	Million tonnes 2009	Percent change 08–09
▲ 23	Thailand	253	-0.1
▼ 24	Turkey	253	-7.3
= 25	Netherlands	249	-0.2
= 26	United Arab Emirates	193	-1.7
= 27	Egypt	192	3.5
▲ 28	Kazakhstan	185	9.8
▼ 29	Argentina	167	-3.2
= 30	Venezuela	162	-1.4
= 31	Singapore	161	-0.1
▲ 32	Malaysia	148	-0.2
▲ 33	Pakistan	140	0.4
▼ 34	Belgium	137	-11.2
▲ 35	Chile	119	24.1
▼ 36	Uzbekistan	115	-9.4
▼ 37	Algeria	114	6.2
▲ 38	Iraq	104	3.7
▼ 39	Greece	100	-5.3
▼ 40	Vietnam	98.8	-4.9
= 41	Czech Republic	95.3	-3.8
▲ 42	Hong Kong	86.0	10.3
▲ 43	Kuwait	84.9	6.3
▼ 44	Romania	80.5	-16.6

Rank/ change on 2008	Country	Million tonnes 2009	Percent change 08–09
▲ 45	North Korea	79.5	14.3
▼ 46	Nigeria	77.7	-22.4
▼ 47	Philippines	72.4	-2.9
▲ 48	Israel	70.5	4.8
▲ 49	Colombia	70.1	7.9
▼ 50	Austria	69.2	-2.5
▲ 51	Qatar	66.5	9.8
▼ 52	Belarus	60.6	-9.5
▲ 53	Syria	56.9	6.1
▼ 54	Turkmenistan	56.8	-1.2
▲ 55	Portugal	56.5	1.5
▲ 56	Bangladesh	55.1	9.4
▼ 57	Libya	53.0	-3.9
▼ 58	Serbia	52.3	-1.2
▼ 59	Finland	52.2	-4.9
▼ 60	Sweden	50.6	-7.7
▼ 61	Hungary	50.0	-10.7
▼ 62	Denmark	49.6	-8.6
▲ 63	Oman	49.0	9.9
= 64	Trinidad and Tobago	47.8	-4.1
▲ 65	Switzerland	45.8	1.0
▼ 66	Bulgaria	44.5	-11.9

Rank/ change on 2008	Country	Million tonnes 2009	Percent change 08–09
▼ 67	Ireland	40.3	-11.2
= 68	Norway	39.6	-0.3
▲ 69	New Zealand	39.1	-1.1
▲ 70	Peru	38.2	4.0
▲ 71	Morocco	36.5	-2.2
▼ 72	Azerbaijan	36.2	-8.9
▼ 73	Slovakia	35.8	-4.5
= 74	Puerto Rico	33.3	-3.2
= 75	Bahrain	31.1	1.6
= 76	Cuba	30.4	4.7
= 77	Ecuador	28.7	1.7
= 78	Angola	24.0	1.8
▲ 79	Yemen	22.9	13.5
▲ 80	Tunisia	23.9	5.7
▼ 81	Croatia	21.5	-4.7
▲ 82	Jordan	20.0	2.4
▲ 83	Dominican Republic	19.9	2.1
▼ 84	Bosnia and Herzegovina	18.3	-15.9
▼ 85	Estonia	17.5	-11.8
▼ 86	Slovenia	17.4	0.5
▼ 87	Lithuania	15.8	-12.8
= 88	Panama	15.5	1.7

Rank/ change on 2008	Country	Million tonnes 2009	Percent change 08–09
= 89	Lebanon	14.8	3.6
= 90	Bolivia	13.9	-2.7
▲ 91	Sudan	13.0	7.0
▲ 92	Sri Lanka	12.8	1.7
▼ 93	Burma	12.5	-9.5
= 94	US Virgin Islands	12.5	-3.5
▼ 95	Jamaica	12.1	-4.6
= 96	Netherlands Antilles	11.6	-4.1
▲ 97	Kenya	11.5	2.4
= 98	Guatemala	11.3	-1.4
▲ 99	Armenia	11.2	1.5
▲ 100	Zimbabwe	10.6	18.6
▼ 101	Luxembourg	10.6	-11.2
▼ 102	Cyprus	9.4	-3.5
▲ 103	Latvia	8.5	8.1
▲ 104	Ghana	8.1	9.6
= 105	Honduras	7.9	-2.1
▼ 106	Brunei	7.6	-27.1
▼ 107	Cameroon	7.5	-1.9
= 108	Mongolia	7.4	-3.8
▼ 109	Macedonia	7.3	-20.1
▼ 110	Uruguay	7.2	-10.2

Rank/ change on 2008	Country	Million tonnes 2009	Percent change 08–09
= 111	Moldova	7.1	-4.1
▲ 112	Ethiopia	6.9	7.1
▼ 113	Costa Rica	6.8	-4.4
▲ 114	Tanzania	6.7	7.1
▼ 115	IvoryCoast	6.6	2.2
▲ 116	Congo	6.3	3.8
= 117	Senegal	6.2	1.8
▼ 118	Tajikistan	6.1	-10.4
= 119	El Salvador	5.9	0.0
= 120	Kyrgyzstan	5.7	-0.4
= 121	Georgia	5.3	-4.9
= 122	Bahamas	5.2	3.1
▲ 123	Papua New Guinea	4.8	6.7
▲ 124	Albania	4.6	3.8
▲ 125	Equatorial Guinea	4.6	-2.1
▲ 126	Gabon	4.6	-3.2
▼ 127	Mauritius	4.6	-1.0
▲ 128	Botswana	4.5	-7.7
▼ 129	Nicaragua	4.5	-2.9
▼ 130	Gibraltar	4.4	-3.8
▲ 131	Namibia	4.1	3.7
▲ 132	Paraguay	4.0	3.7

Rank/ change on 2008	Country	Million tonnes 2009	Percent change 08–09
▼ 133	Cambodia	3.9	-6.1
▲ 134	Benin	3.5	4.3
▲ 135	Nepal	3.4	1.8
▼ 136	Iceland	3.4	-7.4
▲ 137	Palestine	3.2	4.3
▲ 138	Madagascar	3.1	13.4
▼ 139	Malta	3.1	-2.5
▼ 140	New Caledonia	3.0	0.0
▲ 141	Togo	2.8	5.6
▼ 142	Reunion	2.8	0.0
▲ 143	Mauritania	2.7	5.3
▲ 144	Zambia	2.7	18.8
▼ 145	Congo, Dem Rep	2.7	-2.6
▼ 146	Martinique	2.6	6.3
▼ 147	Macau	2.4	1.3
▲ 148	Mozambique	2.3	4.6
▼ 149	Guadeloupe	2.2	-3.1
▲ 150	Haiti	2.1	2.9
▲ 151	Suriname	2.0	4.0
= 152	Uganda	1.9	-3.0
▼ 153	Fiji	1.9	-6.2
= 154	Montenegro	1.9	4.3

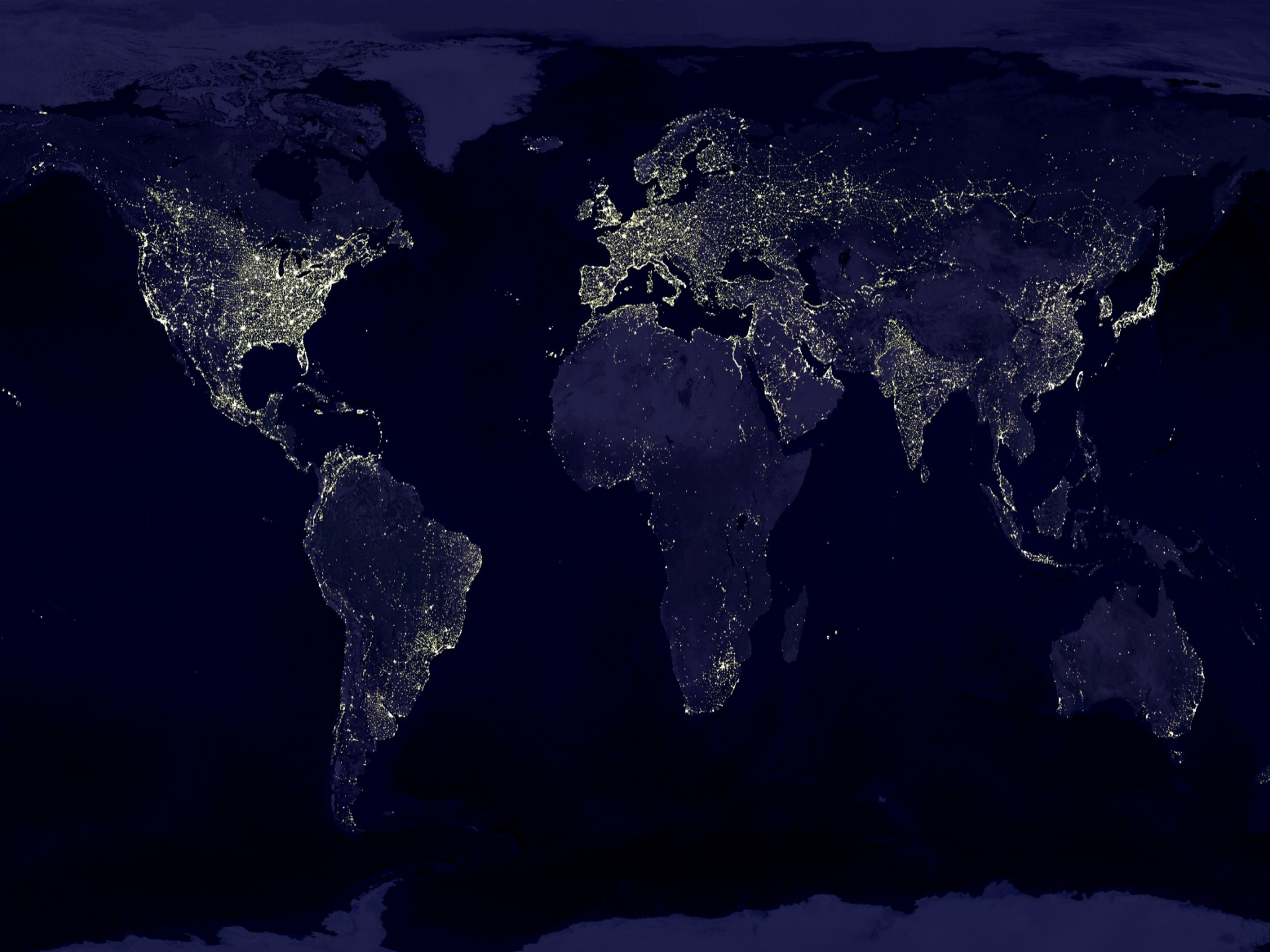
Rank/ change on 2008	Country	Million tonnes 2009	Percent change 08–09
▲ 155	Djibouti	1.8	3.4
▼ 156	Guam	1.7	-3.5
= 157	Guyana	1.5	0.0
▲ 158	Burkina Faso	1.4	2.1
▲ 159	Seychelles	1.4	6.1
▼ 160	Barbados	1.4	-4.0
▲ 161	Swaziland	1.4	17.0
= 162	Niger	1.3	3.5
▼ 163	Guinea	1.3	-1.2
▲ 164	Sierra Leone	1.3	5.9
▼ 165	Malawi	1.2	4.6
= 166	Laos	1.2	1.1
▼ 167	Wake Island	1.2	-4.3
= 168	French Guiana	1.1	6.1
= 169	Aruba	1.1	4.2
▲ 170	French Polynesia	1.1	7.7
▼ 171	Belize	0.94	-5.4
▼ 172	Maldives	0.92	3.4
= 173	Somalia	0.90	3.4
▼ 174	Afghanistan	0.83	-2.9
= 175	Faroe Islands	0.80	6.4
▲ 176	Eritrea	0.77	6.4

Rank/ change on 2008	Country	Million tonnes 2009	Percent change 08–09
▲ 177	Mali	0.74	6.4
▼ 178	Rwanda	0.74	0.0
= 179	Bermuda	0.71	4.2
= 180	Liberia	0.69	2.2
= 181	Antigua and Barbuda	0.69	4.4
= 182	American Samoa	0.67	2.2
▲ 183	East Timor	0.63	8.7
▼ 184	Greenland	0.61	-4.8
▲ 185	Guinea-Bissau	0.46	0.0
▲ 186	Gambia	0.44	15.4
▼ 187	Caymai Islands	0.43	-11.8
▼ 188	Saint Lucia	0.41	0.0
▲ 189	Burundi	0.37	4.0
▲ 190	Cape Verde	0.34	4.5
▼ 191	Bhutan	0.33	-11.1
▲ 192	Western Sahara	0.32	0.0
▲ 193	Antarctica	0.31	17.6
▲ 194	Saint Kitts and Nevis	0.30	11.1
= 195	Grenada	0.30	4.8
▼ 196	Central African Republic	0.29	-13.0
▼ 197	Solomon Islands	0.29	25.0
▼ 198	US Pacific Islands	0.29	0.0

Rank/ change on 2008	Country	Million tonnes 2009	Percent change 08–09
▼ 199	Chad	0.29	11.1
▼ 200	Lesotho	0.27	5.9
= 201	Saint Vincent/Grenadines	0.27	17.6
▲ 202	Nauru	0.20	9.1
▼ 203	Tonga	0.15	-23.1
▲ 204	Cook Islands	0.15	66.7
▲ 205	Comoros	0.15	25.0
▼ 206	Sao Tome and Principe	0.15	11.1
▲ 207	Vanuatu	0.15	25.0
▲ 208	British Virgin Islands	0.15	25.0
▼ 209	Samoa	0.15	-16.7
= 210	Montserrat	0.15	58.7
▼ 211	Dominica	0.14	11.1
▼ 212	Saint Pierre and Miquelon	0.11	16.7
= 213	Turks and Caicos Islands	0.08	0.0
= 214	Falkland Islands	0.05	0.0
= 215	Kiribati	0.04	0.0
= 216	Saint Helena	0.01	11.2
= 217	Niue	0.01	2.9

Table shows total carbon dioxide emissions from the consumption of energy

GRAPHIC: MARK MCCORMICK; PAUL SCRUTON. SOURCE: EIA



What the world needs to watch

Global warming is mainly the result of CO_2 levels rising in the Earth's atmosphere. Both atmospheric CO_2 and climate change are accelerating. Climate scientists say we have years, not decades, to stabilize CO_2 and other greenhouse gases.

To help the world succeed, CO2Now.org makes it easy to see the most current CO_2 level and what it means. So, use this site and keep an eye on CO_2. Invite others to do the same. Then we can do more to send CO_2 in the right direction.

Watch CO_2 now and know the score on global warming, practically in real time.

Weekly Data | Atmospheric CO2

Atmospheric CO_2 - Weekly Data

Mauna Loa Observatory | NOAA-ESRL Data

Week	Atmospheric CO_2
June 12 - 18, 2011 (last week)	393.42 ppm
June 12 - June 18, 2010 (1 year ago)	391.73 ppm
June 12 - June 18, 2001 (10 years ago)	372.87 ppm

CAUSE AND EFFECT

Climate System
Climate Changes
Effects
Scientific Predictions
Climate Science
Temperature
Climate FAQs
Presentations

KNOW CO_2

The Need to Know CO_2
CO_2 Monitoring

KNOW GHGS

Emissions
Methane | CH_4

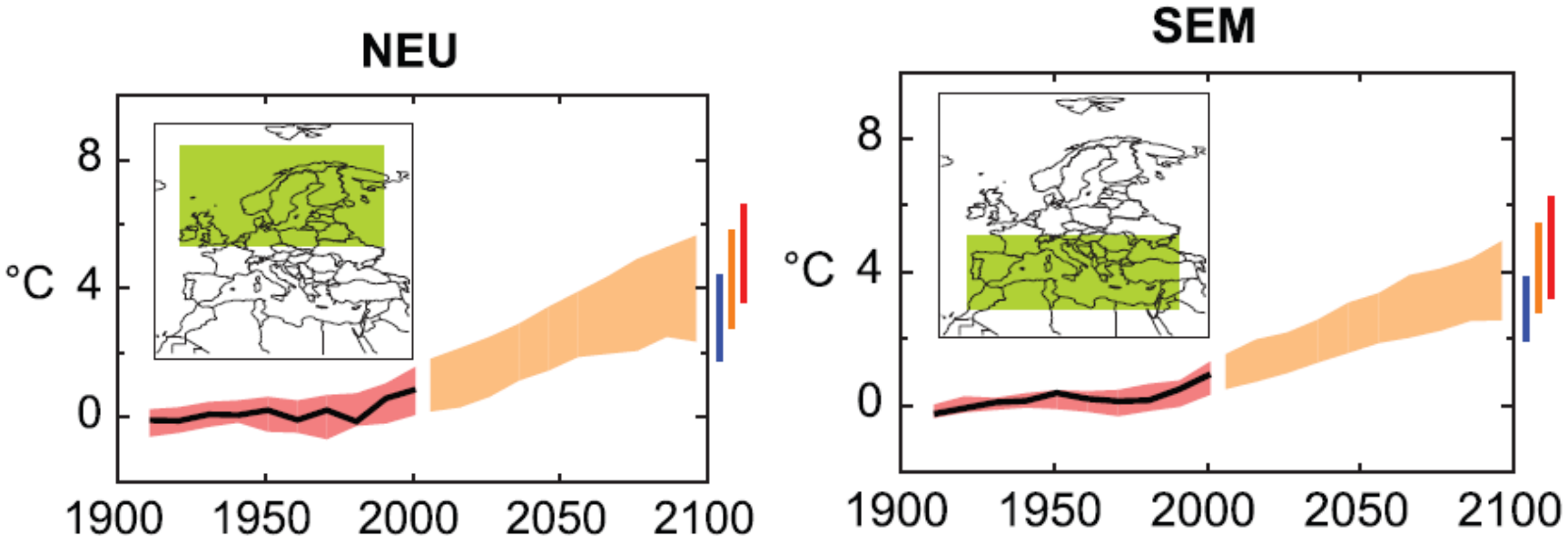


Figure 11.4. *Temperature anomalies with respect to 1901 to 1950 for two Europe land regions for 1906 to 2005 (black line) and as simulated (red envelope) by MMD models incorporating known forcings; and as projected for 2001 to 2100 by MMD models for the A1B scenario (orange envelope). The bars at the end of the orange envelope represent the range of projected changes for 2091 to 2100 for the B1 scenario (blue), the A1B scenario (orange) and the A2 scenario (red). More details on the construction of these figures are given in Box 11.1 and Section 11.1.2.*

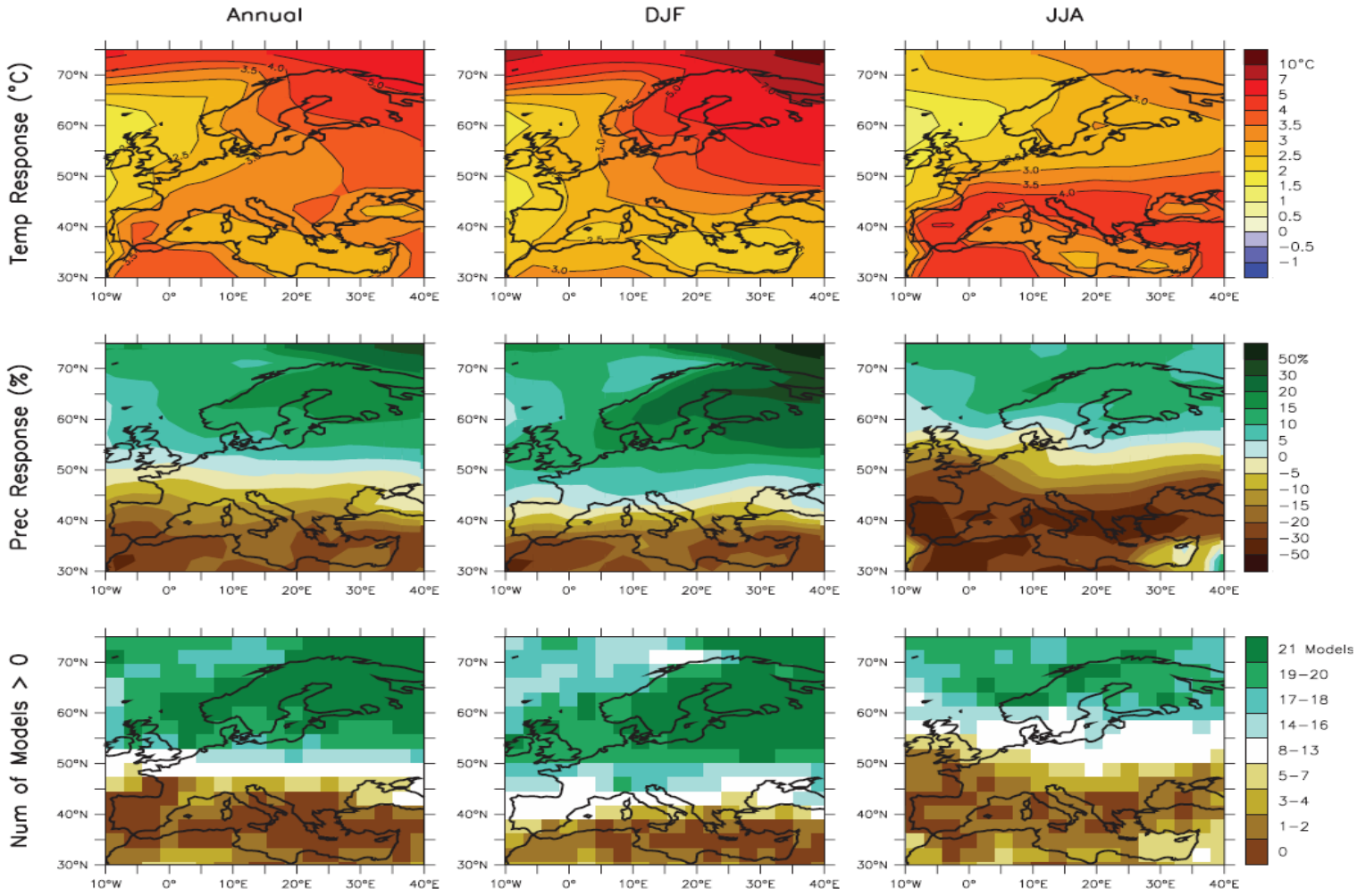


Figure 11.5. *Temperature and precipitation changes over Europe from the MMD-A1B simulations. Top row: Annual mean, DJF and JJA temperature change between 1980 to 1999 and 2080 to 2099, averaged over 21 models. Middle row: same as top, but for fractional change in precipitation. Bottom row: number of models out of 21 that project increases in precipitation.*

Source: EEA, 2011

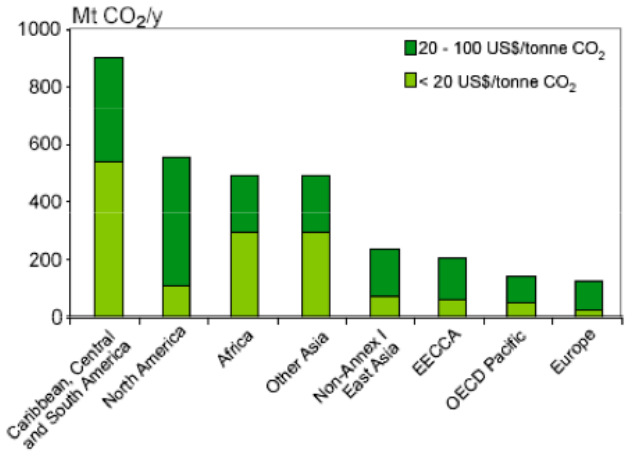
Table ES.3 Greenhouse gas emissions in CO_2-equivalents (excluding LULUCF) and Kyoto Protocol targets for 2008–2012

Member State	1990	Kyoto Protocol base year (a)	2009	Change 2008–2009	Change 2008–2009	Change 1990–2009	Change base year 2009	Targets 2008–2012 under Kyoto Protocol and 'EU burden sharing'
	(million tonnes)	(million tonnes)	(million tonnes)	(million tonnes)	(%)	(%)	(%)	(%)
Austria	78.2	79.0	80.1	– 6.9	– 7.9 %	2.4 %	1.3 %	– 13.0 %
Belgium	143.3	145.7	124.4	– 10.7	– 7.9 %	– 13.2 %	– 14.6 %	– 7.5 %
Denmark	68.0	69.3	61.0	– 2.7	– 4.2 %	– 10.3 %	– 12.0 %	– 21.0 %
Finland	70.4	71.0	66.3	– 4.1	– 5.8 %	– 5.7 %	– 6.6 %	0.0 %
France	562.9	563.9	517.2	– 21.9	– 4.1 %	– 8.1 %	– 8.3 %	0.0 %
Germany	1 247.9	1 232.4	919.7	– 61.4	– 6.3 %	– 26.3 %	– 25.4 %	– 21.0 %
Greece	104.4	107.0	122.5	– 6.0	– 4.7 %	17.4 %	14.5 %	25.0 %
Ireland	54.8	55.6	62.4	– 5.4	– 8.0 %	13.8 %	12.2 %	13.0 %
Italy	519.2	516.9	491.1	– 50.6	– 9.3 %	– 5.4 %	– 5.0 %	– 6.5 %
Luxembourg	12.8	13.2	11.7	– 0.6	– 4.7 %	– 8.9 %	– 11.3 %	– 28.0 %
Netherlands	211.9	213.0	198.9	– 5.7	– 2.8 %	– 6.1 %	– 6.6 %	– 6.0 %
Portugal	59.4	60.1	74.6	– 3.4	– 4.3 %	25.5 %	24.0 %	27.0 %
Spain	283.2	289.8	367.5	– 37.2	– 9.2 %	29.8 %	26.8 %	15.0 %
Sweden	72.5	72.2	60.0	– 3.6	– 5.6 %	– 17.2 %	– 16.9 %	4.0 %
United Kingdom	776.1	776.3	566.2	– 54.0	– 8.7 %	– 27.0 %	– 27.1 %	– 12.5 %
EU-15	**4 264.9**	**4 265.5**	**3 723.7**	**– 274.3**	**– 6.9 %**	**– 12.7 %**	**– 12.7 %**	**– 8.0 %**

Mitigation options

- Maintain or increase the forest area (reducing deforestation and forest degradation, and new forest planting)
- Maintain or increase the carbon density (forest management)
- Substitute fossil fuels with fuelwood
- Increase off-site carbon stocks in wood products

Forests: Regional Distribution of Economic Potential Mt CO_2 by 2030



65% of potential is in developing regions
Developing countries: reduced deforestation 40% of potential
Developed countries, EIT: forest management 63-72% of potential

IPCC

Table 1 – Summary of LULUCF activities in the first Commitment Period of the Kyoto Protocol

Initial land use	Final land use		
	Forest	Cropland	Grazing land
Forest	FM	D	D
Cropland	*AR*	CM	GM
Grazing land	*AR*	CM	GM

The activities shown in italics in the table are also eligible as CDM projects, undertaken in developing countries. For reasons discussed below, the most significant omission in the CDM is the ineligibility of a reduction in deforestation, which could be quantitatively more important than the activities that are eligible.

Fonte: Schlamadinger et al., 2007

Activities elected under Art. 3.4 and accounting frequency. FM: forest management, CM: cropland management, GM: grazing land management, RV: revegetation, CP: commitment period.

	Member State	Art 3.4 elected activities	Accounting frequency
EU-15 Member States	Austria	-	end of CP
	Belgium	-	end of CP
	Denmark	FM, CM, GM	annual
	Finland	FM	end of CP
	France	FM	annual
	Germany	FM	end of CP
	Greece	FM	end of CP
	Ireland	-	end of CP
	Italy	FM	end of CP
	Luxemburg	-	end of CP
	Netherlands	-	end of CP
	Portugal	FM, CM, GM	end of CP
	Spain	FM, CM	end of CP
	Sweden	FM	end of CP
	United Kingdom	FM	end of CP
New Member States	Bulgaria	-	end of CP
	Czech Republic	FM	end of CP
	Estonia	-	end of CP
	Hungary	FM	annual
	Latvia	FM	end of CP
	Lithuania	FM	end of CP
	Poland	FM	end of CP
	Romania	FM, RV	end of CP
	Slovakia	-	end of CP
	Slovenia	FM	end of CP

Dati sulle attività di A/R, D e FM riportati dai Paesi Annex B Parties del Protocollo di Kyoto per il 2008 (in Gt CO2 eq)

	A/R	D	FM	CO_2 balance
Australia	-16 948	49 651		32 703
Austria	-2 531	1 224		-1 307
Belgium	-399	468		69
Bulgaria	1 353	275		1 628
Canada	-738	14 643	-11 503	2 403
Czech Republic	-272	160	-6 145	-6 257
Denmark	-70	35	281	247
Estonia	-534	6 600		6 066
Finland	-1 077	2 886	-39 935	-38 126
France	-13 591	11 926	-84 620	-86 285
Germany	-2 615	16 393	-20 441	-6 663
Greece	-351	4	-2 052	-2 399
Hungary	-1 183	44	-3 885	-5 025
Iceland	-102			-102
Ireland	2 763	11		2 774
Italy	-1 736	386	-50 773	-52 122
Japan	-391	2 431	-46 105	-44 065
Latvia	-440	1 674	-23 595	-22 361
Liechtenstein	-11	4		-8
Netherlands	-547	780		233
New Zealand	-17 396	2 910		-14 486
Norway	-104	-93	-30 827	-31 023
Poland	-3 916	263	-46 865	-50 519
Portugal	-4 134	6 877	2 563	-180
Russia	-4 093	26 607	-462 469	-439 455
Slovakia		2 426	-10 324	-7 897
Slovenia	-2 456	2 385	-10 307	-7 851
Spain	-10 276	188	-39 120	-52 279
Sweden	-1 576	2 385	-18 606	-17 797
Switzerland	-35	82	-855	-808
UK	-2 696	452	-10 873	-13 116
Ukraine	-1 759	150	-47 718	-49 327

Source: http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5270.php
Note: Belarus, Croatia, Lithuania, Luxemburg, Romania and Turkey did not report on the LULUCF sector.

Source: FAO, 2011

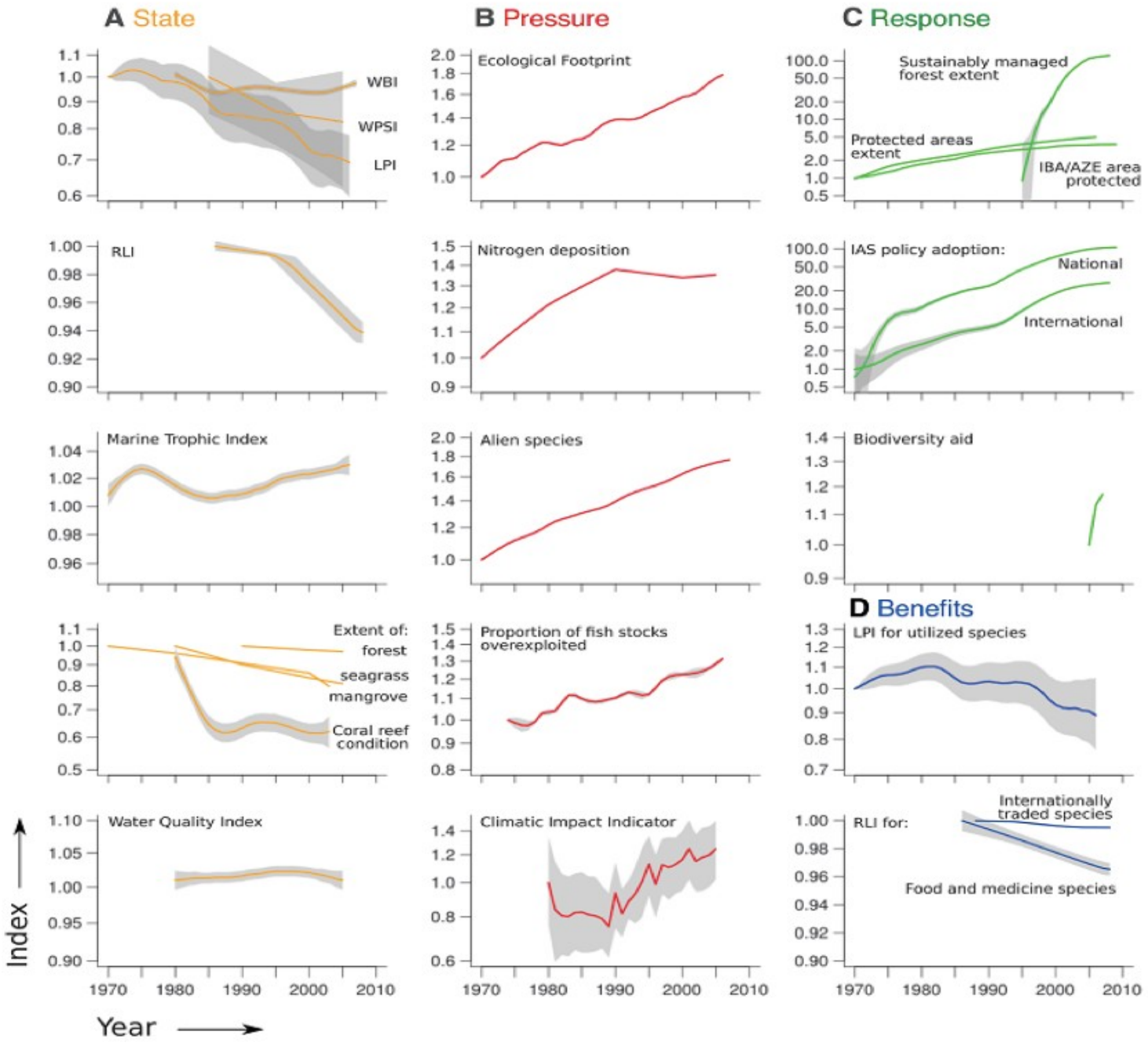
Net emissions (+) and removals (-), Gg CO_2eq

MS	A. Art 3.3 activities				B. Art. 3.4 activities											3.3 off-set (2008+ 2009)	Accounting quantity on KP activities (2008+2009) (from "accounting" sheet of KP LULUCF table)					
	A.1 AR		A.2. D		B.1 FM		B.2 CM			B.3 GM			B.4 RV				AR	D	FM	CM	GM	Rv
	2008	2009	2008	2009	2008	2009	1990	2008	2009	1990	2008	2009	1990	2008	2009							
Austria	-2531	-2648	1224	1264													-5179	2488				
Belgium	-219	-223	168	168													-441	336				
Denmark	-45	-145	32	33	-4829	-2591	2566	2299	1183	314	185	186					-190	66	-916	-2447	-257	
Finland	200	202	3515	3564	-38017	-50310										7592	402	7190	-10525			
France	-6713	-6898	11509	9905	-79041	-73294										8223	-13611	21835	-16133			
Germany	-4476	-4779	1076	1062	-20657	-20642											-9256	2145	-22733			
Greece	-351	-351	4	0	-2052	-1955											-701	4	-1650			
Ireland	-2709	-2863	26	34													-5564	59				
Italy	-6346	-6731	388	390	-51162	-48494											-13039	778	-50967			
Luxembourg	-77	-78	141	141													-155	282				
Netherlands	-485	-537	820	832													-1022	1655				
Portugal	-3173	-3296	1361	1396	-8378	-9463	145	-136	-259	-618	-953	-964					-6387	2831	-4033	-698	-681	
Spain	-6397	-6545	106	107	-18608	-18629	-712	-3559	-3000								-12909	213	-12283	-5135		
Sweden	-1270	-981	4039	3516	-37887	-44603										5310	-2250	7561	-15944			
UK	-2695	-2823	635	431	-10888	-9912											-5518	1284	-6783			
EU-15	-37287	-38696	25044	22843	-271519	-279893	1999	-1396	-2076	-304	-768	-778				21125	-75820	48727	-141967	-8280	-938	
EU 12	-11260	-12154	2859	3057	-126550	-125470							-5	-48	-48	1730	-23261	6103	-63672			-86
EU-27	-48548	-50850	27903	25900	-398069	-405363	1999	-1396	-2076	-304	-768	-778	-5	-48	-48	22855	-99081	54830	-205639	-8280	-938	-86

1 FR did not include removals from AR for accounting purposes

2 The sum of MS' emissions/removals is shown for information purpose only. The EU-15 will neither issue nor cancel accounting units.

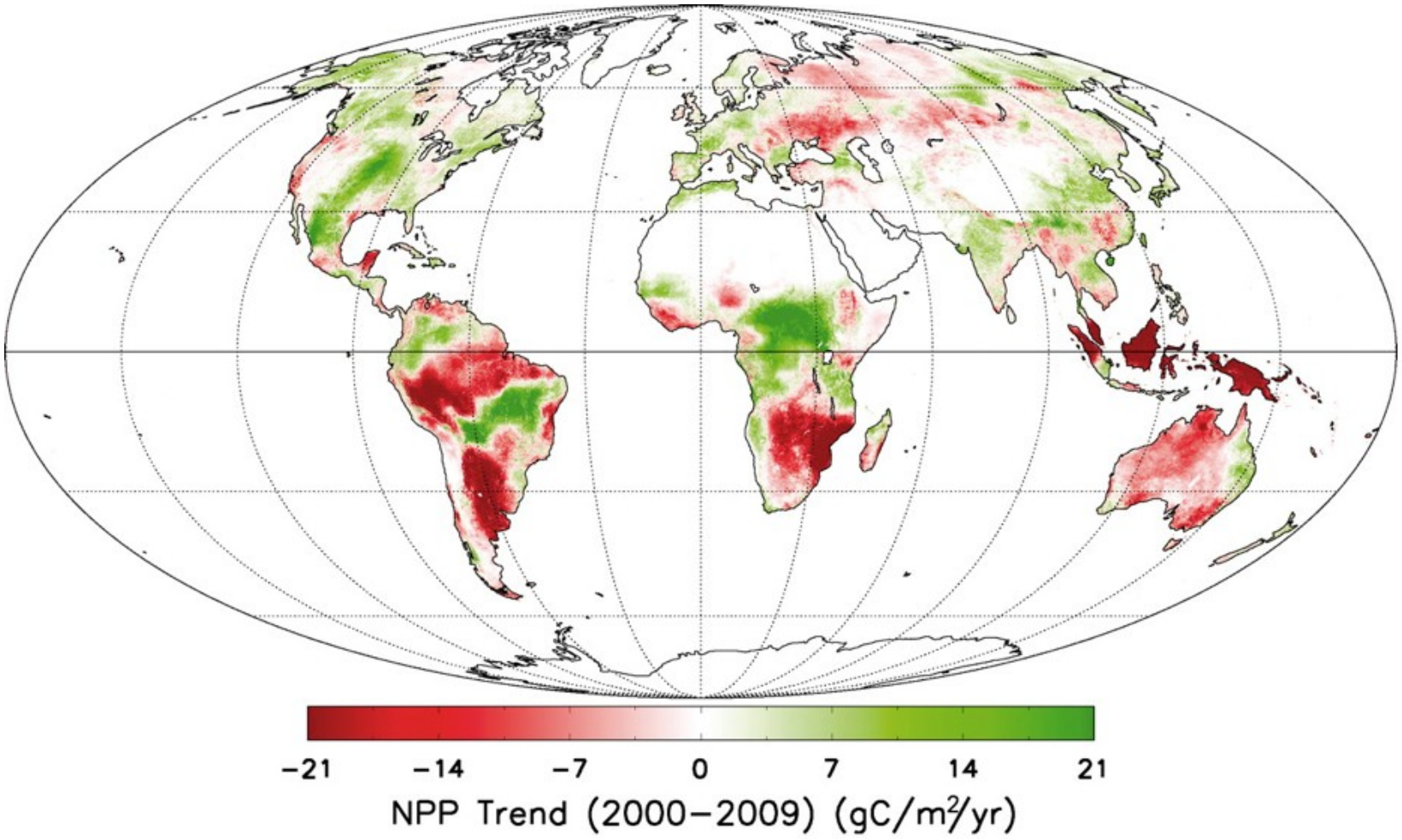
IMPACTS



Butchart *et al*., Science, 2010

IMPACTS

Spatial pattern of terrestrial NPP linear trends from 2000 through 2009 (SOM text S1) (8, 10).

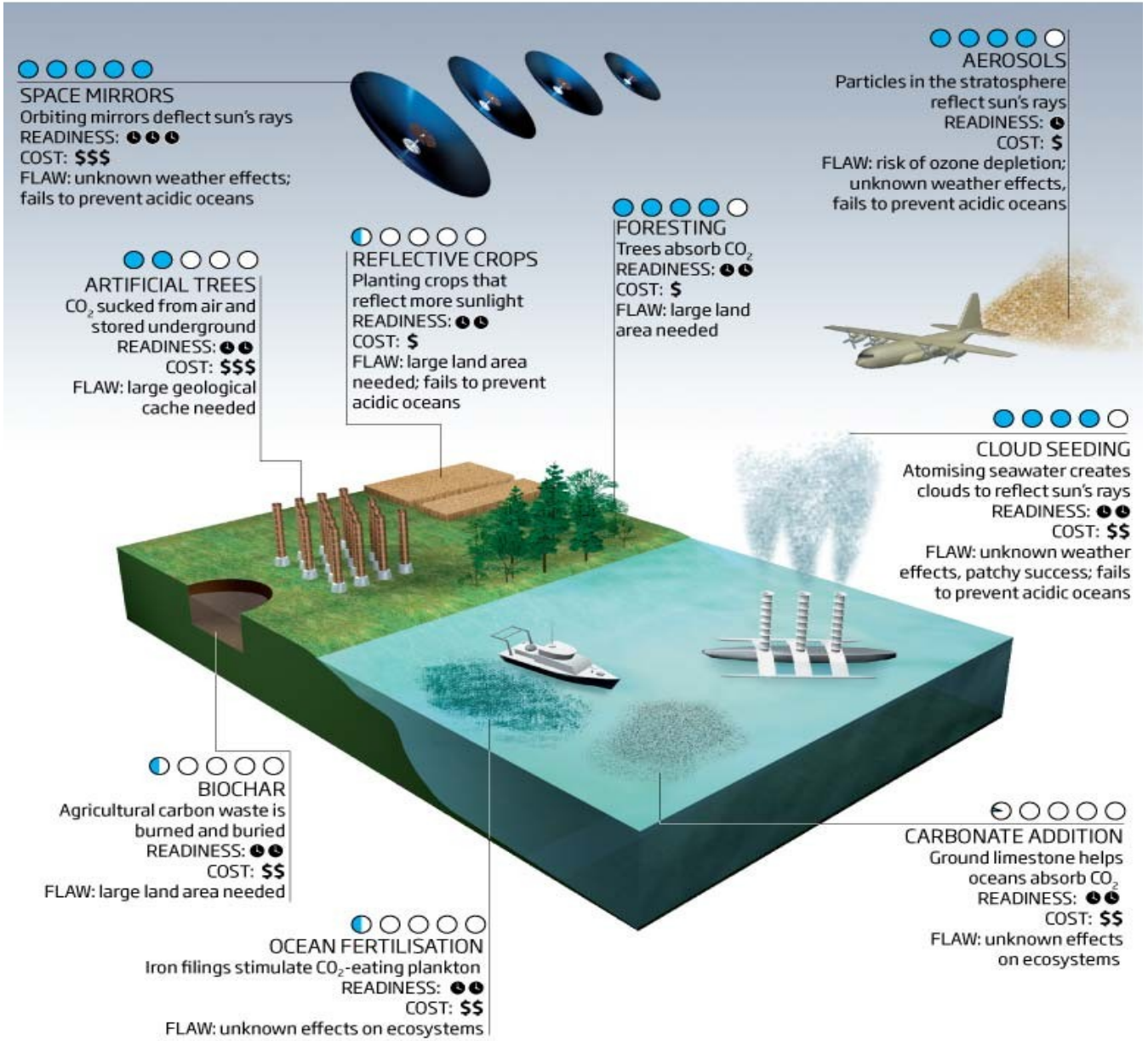


M Zhao, S W Running, Science 2010;329:940-943

Impacts of Mitigation Strategies

Impacts of Mitigation Strategies

Geoengineering weighed up



ADAPTATION STRATEGIES

Adaptation options

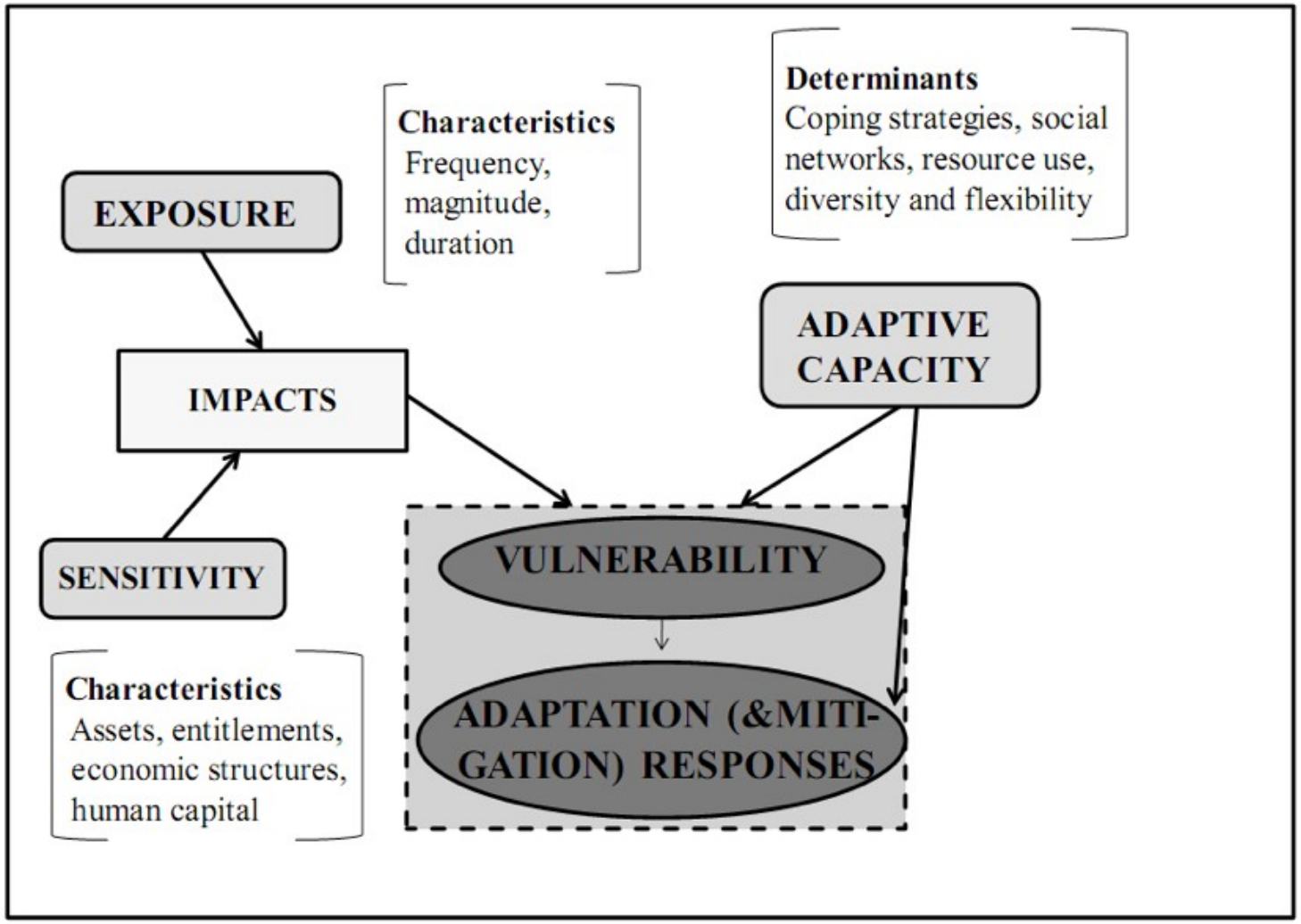
A. Strengthening adaptive capacity of trees and forests especially in fragile forest ecosystems

- Management of forest biodiversity, including through supporting adaptation of species and more suitable provenances
- Maintaining forest health and vitality to reduce vulnerability, including e.g. against insects and diseases
- Improving fire suppression and control
- Adaptive management practices

B. Strengthening adaptive capacity of forest/rural communities

- Strengthening how communities cope with extreme events today
- Diversifying forest related employment opportunities and livelihoods
- Practicing adaptive land use planning and management

Figure 1. Vulnerability framework



Fonte: International Food Policy Research Institute, 2009

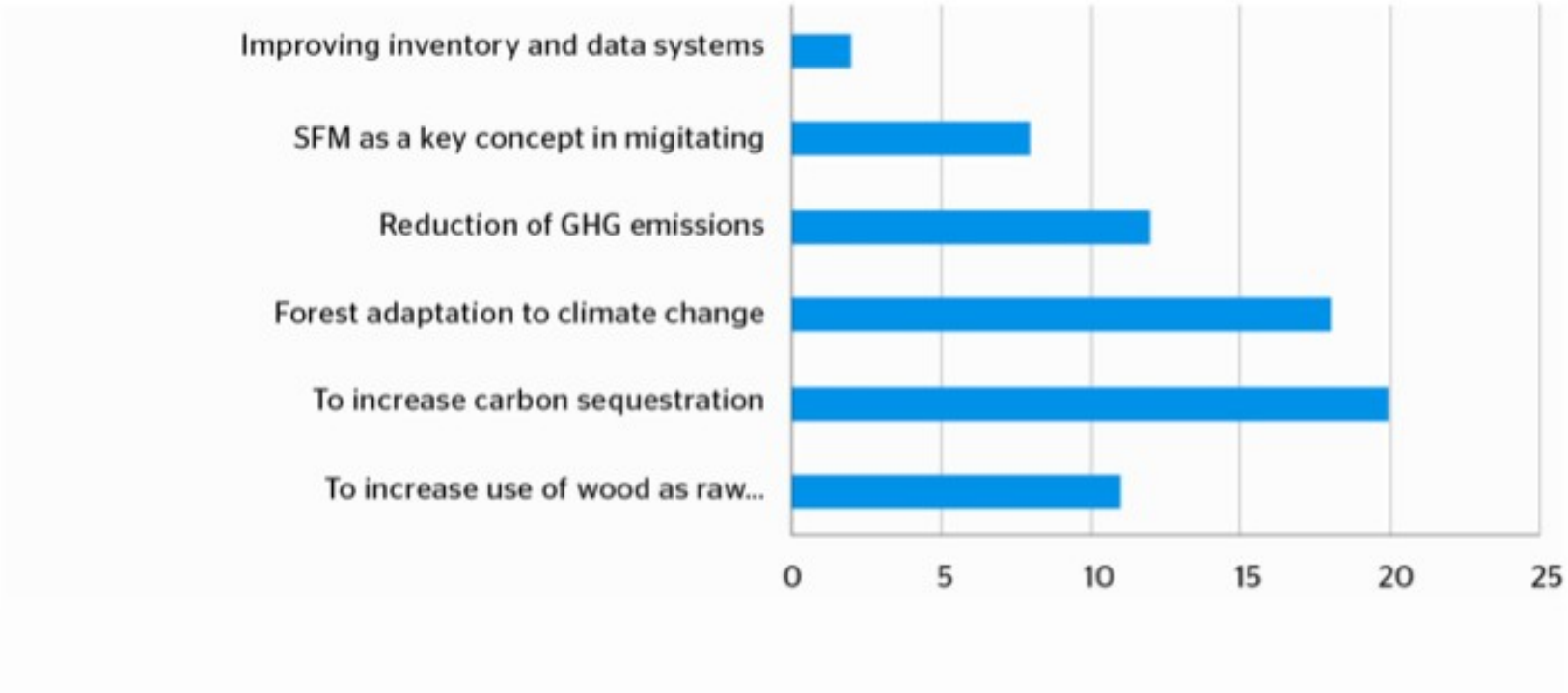
Adaptive capacity

1. Inherent biological adaptive capacity of forests (annual crops better than perennial, gamic better than agamic)
2. Farm organization
3. Technical skills (percentage of agriculturalist living in the study area)
4. Access to credit
5. Farm income
6. Farm holding size
7. Share of agriculture and forestry GDP
8. Farm assets
9. Infrastructure index

FINAL REMARKS

Challenges for forest policies

Many countries have explicit objectives on the forest related carbon balance



FINAL REMARKS

Challenges for forest policies

- After initial hopes, …EU forest policy does not seem to be coherent to the inclusion of forest sinks
- Legislation: statutory laws that help to effect policies and include rules and regulations defining rights and obligations.
- Climate change mitigation and adaptation: find the right path (and synergies and trade-off) and maintain sustainable forest management
- Assessment of vulnerability is key (exposure, sensitivity, and adaptive capacity).
- Mobilise enough wood for energy
- Reconcile biodiversity goals with other societal demands on forests, for example provision of renewable material and energy
- Use the potential of the forest sector to foster green economy

FINAL REMARKS

Challenges for forest research and information

- exchange and dissemination on forests and climate change, including through e.g. climate change impact and vulnerability assessments,
- research on biophysical, social, and policy aspects of forests and climate change,
- forest inventories and forest information systems, and traditional knowledge;
- reporting data and information to UNFCCC and other international bodies,
- inform decision-making on forest-related adaptation and mitigation, to evaluate the effects of related programmes and to report to UNFCCC,
- outreach to stakeholder groups and the public.

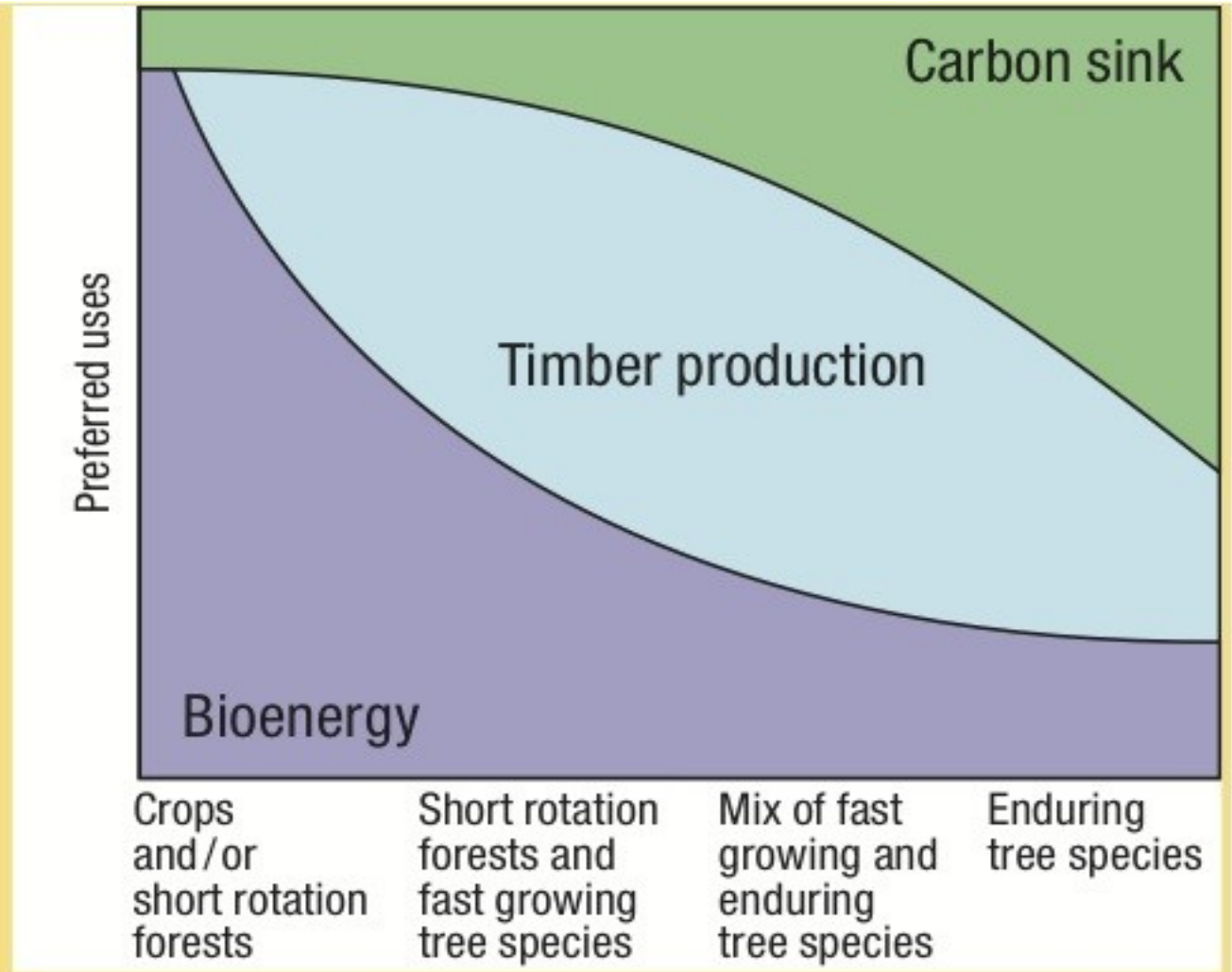


Figure 5. How choice of crops, types of tree species and management regime can be selected to achieve a mix of bioenergy production, timber production and carbon sink.

Foto di Paolo Orlandi

Lavoro realizzato con i contributi di:
Carmela Cascone e Salvatore Cipollaro